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How can deprescribing be safely and routinely implemented within primary care?

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Submitted in accordance with the requirements for the degree of Doctor of Philosophy

University of Leeds

School of Healthcare

September 2023

Intellectual Property and Publication Statements

The candidate confirms that the work submitted is his own, except where work which has formed part of jointly authored publications has been included. The contribution of the candidate and the other authors to this work has been explicitly indicated below. The candidate confirms that appropriate credit has been given within the thesis where reference has been made to the work of others.

Chapter 2 – Scoping review is based on the work from the following published abstract:

Daniel A Okeowo and Syed Tabish R Zaidi, Beth Fylan, David P Alldred, Routinely implementing safe deprescribing in primary care: a scoping review, International Journal of Pharmacy Practice, Volume 30, Issue Supplement 1, April 2022, Pages i4–i5.

Daniel Okeowo designed the research, conducted the scoping review, and drafted the abstract manuscript. Professor David Alldred, Associate Professor Syed Tabish R. Zaidi and Dr Beth Fylan (PhD supervisory team) provided guidance on the design of the research, screened articles, reviewed, edited, and approved the final manuscript.

Chapter 4 – Barriers and facilitators of implementing deprescribing in primary care: A systematic review is based on work from the following publication:

Daniel A Okeowo and Syed Tabish R Zaidi, Beth Fylan, David P Alldred, Barriers and facilitators of implementing proactive deprescribing within primary care: a systematic review, International Journal of Pharmacy Practice, Volume 31, Issue 2, April 2023, Pages 126–152.

Daniel Okeowo designed the research, conducted the systematic review, and drafted the manuscript. Professor David Alldred, Associate Professor Syed Tabish R. Zaidi and Dr Beth Fylan provided guidance on the design of the research, screened articles, reviewed, edited, and approved the final manuscript.

Chapter 5 – Study 2: Patient interviews is based on the work from the following published abstract:

Daniel A Okeowo and Syed Tabish R Zaidi, Beth Fylan, David P Alldred, 497 Patient perspectives of safe and routine deprescribing for older people living with polypharmacy: an interview study, International Journal of Pharmacy Practice, Volume 31, Issue Supplement 1, April 2023, Page i36.

Daniel Okeowo designed the research, sought ethical approval, conducted the data collection, and drafted the abstract manuscript. Professor David Alldred, Dr Beth Fylan and Associate Professor Syed Tabish R. Zaidi provided guidance on the design of the research, reviewed, edited, and approved the final manuscript.

Chapter 7 – Co-design study: Developing deprescribing resources review is based on the work from the following published abstract:

Daniel A Okeowo and Beth Fylan, Faiqah Quyyam, Nazreen Butt, Tom Mills, Syed Tabish R Zaidi, David P Alldred, 495 Developing deprescribing resources for older people with polypharmacy living in primary care: using co-design and logic modelling, International Journal of Pharmacy Practice, Volume 31, Issue Supplement 1, April 2023, Pages i35–i36.

Daniel Okeowo designed the research, conducted the co-design workshops, co-designed the outputs with patients and healthcare professionals, and drafted the abstract manuscript. Faiqah Quyyam and Nazreen Butt co-facilitated the co-design workshops. Tom Mills provided expert advice in intervention development and approved the final abstract manuscript. Professor David Alldred, Dr Beth Fylan, and Associate Professor Syed Tabish R. Zaidi provided guidance on the design of the research, reviewed, edited, and approved the final manuscript.

Acknowledgements

I would like to express my gratitude to Professor David Alldred, Dr Beth Fylan, and Associate Professor Syed Tabish R. Zaidi for their invaluable help, support, and guidance throughout my doctoral program. Even during challenging times, especially the COVID-19 pandemic, they consistently provided support and made me feel at home in Leeds.

I must also extend my thanks to my colleagues in the School of Healthcare at the University of Leeds, the University of Bradford, and the NIHR Yorkshire and Humber Patient Safety Translational Research Centre. Without their continuous advice and kindness, it is challenging to envision how this research could have reached completion.

My appreciation goes to all the patients and healthcare professionals who participated in this research. Your words and ideas, even beyond the scope of this research, have significantly contributed to my reflections on the future of healthcare. Your involvement has ignited a passion within me to advocate for safe medicine use for every individual on this planet.

I am grateful to my family for their unwavering love and support, especially considering the distance from home. Dr Mark Amadi and every member of Fountain of Peace Ministries, London, deserve my thanks for their prayers and motivational words, all of which did not go unnoticed. I also want to acknowledge all my friends, particularly those I met in Leeds. Your presence helped me persevere through challenging times and for this, I am so grateful. To Nathan, Petros, Ram, and Kevin – thank you for checking up on me and bringing London to Leeds at any given opportunity. To all my St. Ann's group – Thank you all for helping me settle into Leeds so quickly; it was as if we had known each other for years. There are not enough words to properly express my gratitude for everyone who has been part of this journey.

I would like to dedicate this thesis to my late grandad, Chief Matthew Olubode Akinpelu JP, who passed away on Sunday, January 26th, 2020. I believe you are watching over us from the heavens and sending your love. This one is for you.

Abstract

Background: As a result of ageing and advances in technology, people are living longer with multiple co-morbidities, and are likely to take multiple medicines concurrently. This can lead to problematic polypharmacy and the use of inappropriate medicines, compromised patient safety, and higher costs. Deprescribing has been identified as a way of addressing problematic polypharmacy. However, there is limited knowledge, derived from implementation science, concerning the safe and routine implementation of deprescribing in primary care.

Aim: To identify the barriers and facilitators, and effective strategies, to safe and routine implementation of deprescribing in primary care.

Methods: A multi-method, pragmatic approach used Normalisation Process Theory to guide research methods and contextualise findings. This comprised a systematic review to identify barriers and facilitators to deprescribing implementation and interviews with patients and healthcare professionals to explore their views on deprescribing in primary care. This informed a co-design process with patients and healthcare professionals to produce deprescribing resources to aid implementation in primary care.

Results: A lack of reporting of implementation factors and research on deprescribing appraisal was identified. Patients highlighted the significance of deprescribing rationales; clear communication; interpersonal skills; education; support; and provided views on healthcare professionals' involvement. Healthcare professionals expressed that current healthcare is focused on prescribing with minimal deprescribing consideration, how stakeholder buy-in can drive implementation, how safety can be maintained through follow-ups and safety nets, and the potential role of community pharmacists. The co-design process identified patients as potential catalysts for routine deprescribing, and the role of community pharmacists as a safety net. This led to the development of medicine necessity questions for patients and a logic model of a community pharmacy deprescribing safety net.

Conclusion: Deprescribing resources have been developed that may aid the implementation of routine, safe deprescribing in primary care. Future work should assess their feasibility and effectiveness.

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List of abbreviations

ADE – Adverse drug event

ADR – Adverse drug reaction

ADWE – Adverse drug withdrawal events

BCT – Behaviour change technique

BCW – Behaviour Change Wheel

CCG – Clinical commissioning group

CDSS – Clinical decision support system

CI – Confidence intervals

CP – community pharmacist

CVD – Cardiovascular disease

CPCS – Community Pharmacy Consultation Service

CPCF – Community Pharmacy Contractual Framework

EMR – Electronic Medical Records

GPhC – General Pharmaceutical Council

GP – General practitioner

HCP – Healthcare professional

HRA – Health Research authority

ICS – Integrated care system

IT – Information Technology

MDT – Multidisciplinary team

MMAT – Mixed Methods Appraisal Tool

MRC – Medical Research Council

MUR – Medicine use review

NHS – National Health Service

NICE – The National Institute for Health and Care Excellence

NMS – New medicine service

NPT – Normalisation Process Theory

PCN – Primary care network

PPIE – Patient and Public Involvement and Engagement

PPI – Proton pump inhibitor

PIM – Potentially Inappropriate Medicine

PQS – Payment Quality Scheme

QI – Quality Improvement

REC – Research Ethics committee

RWLM – Real World Logic Model

SEIPS - Systems Engineering Initiative for Patient Safety

SMR – Structured medication review

TDF – Theoretical Domains Framework

WHO – World Health Organization

Chapter 1 – Introduction

This chapter introduces the healthcare landscape in which the present doctoral research is situated. It sheds light on the evolving patterns in medicines utilisation and healthcare consumption that have emerged because of advancements in medical science and technological innovation. Additionally, it delves into the growing prevalence of polypharmacy, whereby multiple medicines are concurrently used, and highlights the inherent risks that may follow. Furthermore, it presents potential avenues for addressing the issues surrounding problematic medicine use and discusses the potential roles that healthcare professionals can assume within this domain.

1.1. An ageing population and multi-morbidity

Rapid advancements in healthcare technology have brought about a remarkable transformation, extending lifespans to unprecedented lengths. It is increasingly well recognised that people are living longer in developed and developing countries. This is particularly true in Western countries such as the United Kingdom (UK) where life expectancy has almost doubled since the 1800s (Office For National Statistics, 2015). Globally, it is predicted that the proportion of people aged 60 years and over will nearly double to 2.1 billion by 2050 (The World Health Organization, 2022). The growing pace of such ageing is further evidenced with the number of people aged 80 years and older expected to triple between 2020 and 2050 (The World Health Organization, 2022). Although this trend in ageing began in high-income countries, low- and middle-income countries are now experiencing it, yet at a faster rate (The World Health Organization, 2022). In the UK, the ageing population trend is expected to continue with no signs of slowing down (Office For National Statistics, 2015).

Multiple reasons have been attributed to this global ageing phenomenon, however a fundamental cause is the increase in life expectancy as a result of improved healthcare (Epure, 2012). As the ability to diagnose and treat medical conditions has improved, the corresponding mortality to such conditions has reduced. An example being coronary heart disease, which has seen a reduction in mortality rates as a result of an improved understanding of risk factors and improved diagnostics and management plans (Capewell et al., 2010). People are now living longer with diseases that historically would have significantly reduced life expectancy.

This has subsequently led to people living longer but with multiple long-term health conditions, known as multi-morbidity (Aggarwal et al., 2020). In England alone, 54% of people aged 65 years or older presented with multi-morbidity in 2015, and this is expected to increase to 68% by 2035 (Kingston et al., 2018). With multi-morbidity becoming increasingly prevalent among this population, the provision of healthcare services becomes more complex, requiring heightened attention to the management of multiple co-morbidities within individual patients (Wallace et al., 2015). Clinicians may experience a sense of being overwhelmed when confronted with the daunting task of discerning the intricate interrelationships among existing and ongoing ailments. They are required to navigate the complexities of managing multiple conditions simultaneously, whilst also striving to prioritise effectively and seize opportunities for health promotion (Muth et al., 2014b). Multiple diseases and their respective treatment regimens may also interact with each other, further compromising patient health as a result (Muth et al., 2014a).

Consequently, the ability to effectively meet the diverse needs of patients has become progressively challenging, particularly in the face of escalating healthcare costs and utilisation. The growing population, coupled with the prevalence of multi-morbidity, further compounds this challenge, as an increasing number of individuals seek access to healthcare services. In the UK, multi-morbidity has been associated with increased: total, hospital, and care transitions costs; primary care, dental care and emergency department use and hospitalisation (Soley-Bori et al., 2021). Patients with multi-morbidity typically need multiple prescribed medicines to alleviate associated symptoms and/or restrict disease progression (Aggarwal et al., 2020). As such, there is a natural link between the increase in the older adult population, multi-morbidity, and the use of multiple medicines.

1.2. Polypharmacy

The use of prescribed medicines in the UK has been steadily increasing for the past decade. In 2017 alone, 1.1 billion items were dispensed in the community to patients within England and the average number of prescription items dispensed per head of population was 20 per year (NHS Digital, 2018). With the reported increase in medicines dispensed, and a growing number of prescription items per person, polypharmacy has become increasingly prevalent in the UK.

Polypharmacy has historically been defined as the use of at least five or more medicines concurrently (Masnoon et al., 2017). However, definitions have varied in

the literature with numerical thresholds including a minimum of 10, which can also be described as hyper-polypharmacy (Cho et al., 2022). The numerical threshold of five concurrent medicines has been widely accepted due to the associated risk of adverse outcomes in older patients, such as frailty, falls and mortality (Masnoon et al., 2017).

In tandem with the upwards trend of ageing and multi-morbidity, the prevalence of polypharmacy continues to rise. In a prescribing evaluation study in Scotland, the proportion of Scottish adults taking 5-9, 10-14, or 15 or more medicines concurrently had almost doubled since 1995 (Guthrie et al., 2015). This trend has also been seen in other countries across the globe and highlights the widescale prevalence of polypharmacy worldwide (Zhang et al., 2020). The older patient population, aged >65 years, has also shown significant increases in polypharmacy compared to younger patients (Hajjar et al., 2007).

The rise in polypharmacy may be seen as an unavoidable consequence of healthcare. As multi-morbidity rises, many patients will require multiple treatment plans to ensure effective care. Medicines may also be prescribed to overcome adverse reactions resulting from the initial medicine prescribed, referred to as the prescribing cascade (Kalisch et al., 2011, Rochon and Gurwitz, 1997).

1.2.1. Appropriate Polypharmacy

A report commissioned by the King's Fund looked to distinguish between the positive and negative impact of polypharmacy by categorising polypharmacy as 'appropriate' or 'problematic'. Appropriate polypharmacy is defined as:

> *'Prescribing for an individual for complex conditions or for multiple conditions in circumstances where medicines use has been optimised and where the medicines are prescribed according to best evidence.' (Duerden et al., 2013, p. 1)*

This definition describes instances where the use of multiple medicines is unavoidable and required to provide optimised care that has been derived from evidence. The use of multiple medicines has seen to be beneficial for the patient and reduce adverse outcomes, such as hospitalisation (Payne et al., 2014). As a result, polypharmacy has been described as a "*necessary evil, that for many patients is required to improve outcomes*" (Duerden et al., 2013, p. 33). Specifically, appropriate polypharmacy can benefit patients, but care must be taken to

continually ensure polypharmacy remains appropriate or it runs the risk of becoming 'problematic'.

1.2.2. Problematic Polypharmacy

1.2.2.1. Definition and clinical practice guidelines

Problematic polypharmacy is defined as:

> *'the prescribing of multiple medications inappropriately, or where the intended benefit of the medication is not realised' (Duerden et al., 2013, p. 1)*

The definition encompasses the negative aspect of polypharmacy where the use of multiple medicines places an increased risk of adverse, as opposed to improved, patient outcomes. This includes when the overall demands of managing medicines or 'pill burden' is unacceptable for the patient or the medicine combination used is hazardous due to an interaction (Duerden et al., 2013). An increase in the number of medicines has been shown to increase the risk of patients experiencing adverse drug reactions (ADRs), treatment burden, mortality and costs within the National Health Service (NHS) (Pirmohamed et al., 2004). Consequently, problematic polypharmacy may directly lead to non-adherence, increased use of potentially inappropriate medicine (PIMs), ADRs and higher care costs (Hajjar et al., 2007, Maher et al., 2014).

Clinical practice guidelines (CPGs), which govern prescribing practices, are largely based on single disease models that rarely address patients with multiple co-morbidities (Uhlig et al., 2014, Okeowo et al., 2018). These guidelines promote the prescribing of medicines but rarely discuss when medicines should be ceased. While the resulting polypharmacy may be beneficial at times in a given patient to improve specific health outcomes or improve their quality of life, polypharmacy may become problematic due to increased frequency of adverse effects and drug-drug and drug-disease interactions (Duncan et al., 2017). Hence, it is important to ensure patients remain on the minimum appropriate number of medicines throughout their treatment plan, as each additional unnecessary medicine prescribed increases risks of iatrogenic harm (Guthrie et al., 2015, Cresswell et al., 2013).

1.2.2.2. Potentially Inappropriate Medicines

PIMs are medicines with a higher risk of adverse drug events (ADE) (Thorell et al., 2020). PIMs are known to increase morbidity and mortality and therefore should be avoided to maintain patient safety (Galli et al., 2016). There are challenges in calculating the prevalence of PIMs due to the individualistic nature of patient treatment plans. This means that a medicine that is considered a PIM for one patient due to their current medicine regimen, clinical status, and risk factors, may not be considered as a PIM for another. However, validated screening tools such as the Beers criteria and Screening Tool of Older persons' Potentially inappropriate Prescriptions (STOPP), have been used to identify PIMs within studies (American Geriatrics Society, 2019, Gallagher and O'Mahony, 2008). The Beers criteria is a list of medicines that have been considered as PIMs in the older adult population based on expert consensus (American Geriatrics Society, 2019). Similarly, STOPP is criteria used to identify PIMs in older adults developed through consensus with doctors, pharmacists, pharmacologists, and specialists in geriatric medicine (Gallagher et al., 2008). Both are examples of explicit tools, providing a specific criteria in which to make a decision, as opposed to implicit tools that rely on professional judgment (Bahat et al., 2017).

Using the Beers criteria, a recent cross-sectional study investigated the prevalence of PIMs among patients ≥65 years old admitted into hospital. Beers criteria were applied to inpatient records to quantify PIMs prevalence over a one-year period (1st January 2019 to 31st December 2019). This study found that at least one PIM was present in 58.4% of the patients admitted to hospital that year. It was highlighted that patients using ≥5 medicines were at a significantly increased risk of having a PIM prescribed ($p < 0.001$, OR = 1.6, 95% CI = 1.4–1.8) (Alshammari et al., 2022). Although the researchers accessed medical records, which may not always accurately depict medicines use if information is not stored correctly or medicine use is not disclosed, other studies have also found polypharmacy to be a predictor of PIM use (Gallagher et al., 2011, Fialová et al., 2005, Drusch et al., 2023). This highlights the significant risk of ADEs that is associated with older adults who are increasingly prescribed multiple medicines. Indeed, many of the hospitalisations caused as a result of ADEs are preventable (Pirmohamed et al., 2004). A recent observational study, based in an NHS trust in England, explored the burden and associated costs of ADRs, polypharmacy and multimorbidity through medical admissions. Over a one-month period 18.4% (218) of admissions had an ADR, in which 90.4% were ADRs that directly led to or contributed to admissions (Osanlou

et al., 2022). It was noted patients with ADRs typically were taking more medicines (10.5 vs 7.8, $p<0.01$) and had more comorbidities than those without (6.1 vs 5.2, $p<0.01$). Whilst 40.4% of ADRs were classified as avoidable or possibly avoidable, it was calculated that the 1-month cost to the trust from ADRs was £490,716 and if extrapolated nationally, was predicted to cost the NHS £2.21 billion (Osanlou et al., 2022). This observation not only accentuates the risks associated with polypharmacy and multi-morbidity, but also stresses the substantial financial implications imposed on healthcare services because of potentially avoidable circumstances.

Multiple factors have been identified that contribute to the use of PIMs. The process of ageing is known to cause frailty, which is a reduction in physiological reserves and the inability to cope with stress, illness and injury (Young and Maguire, 2019). There are also a number of pharmacokinetic changes that occur as a result of ageing which can affect the pharmacodynamic properties of medicines (Table 1). As such, this can lead to medicines that were previously tolerable to start causing ADRs.

Table 1 – Summary of age-related pharmacokinetic and physiological changes affecting pharmacodynamics reproduced from Daniela et al. (2020)

Pharmacokinetics	**Physiological changes**
Absorption	Increased gastric pH Decreased gastrointestinal motility Decreased intestinal permeability Decreased gastrointestinal blood flow
Distribution	Decreased lean body mass Increased fat body mass Decreased body water
Metabolism	Decreased liver volume Decreased blood flow Decreased hepatic clearance rates
Excretion	Reduced renal blood flow Decreased glomerular filtration rates

	Increased urea excretion Decreased creatinine production Decreased renal clearance rates

Older patients can also experience geriatric syndromes, which are age-related conditions such as dementia, depression, delirium, incontinence, vertigo, falls, spontaneous bone fractures, failure to thrive, neglect and abuse (Balducci, 2014). Older patients with geriatric syndromes have been found to be at an increased risk of taking PIMs or receiving a PIM prescription in the future (Muhlack et al., 2018). The clinical management of geriatric syndromes is particularly problematic as the medicines required to treat one syndrome, such as depression, can lead to the exacerbation of another, such as falls (de Jong et al., 2013).

Another factor driving the use of PIMs is the lack of clinical trial evidence for medicine use in older patients. Older patients are already susceptible to ADRs because of ageing, as previously described, but this can be further exacerbated with insufficient clinical trial evidence for the safe use of medicines within this demographic due to underrepresentation in clinical trials. The major contributors for such underrepresentation are arbitrary age limits and exclusion criteria for conditions highly prevalent in older patients (van Marum, 2020). One study in 2019 investigated clinical trials from 1965 – 2015 investigating causes for hospitalisation and disability-adjusted life years in older patients. From 633 phase III clinical trials, the study found 33% had an arbitrary upper age limit with a quarter of these studies not recruiting participants ≥65 years old, despite the trial focus on the older adult population (Lockett et al., 2019). A similar study evaluated the exclusion of older patients in 839 clinical trials investigating medical interventions for ischaemic heart disease, where 53% of these trials excluded older patients and the estimated study population aged ≥75 years old was 12.3% (Bourgeois et al., 2017).

1.3. Overcoming the burden of PIMs

An economic analysis investigated the prevalence of UK-based medicine errors in prescribing, dispensing, administration and monitoring within primary care, secondary care, and care homes settings. This study estimated that 237 million medication errors occur at some point in the medicine use process annually, with 38.4% occurring in primary care and primary care prescribing accounting for 34% of

all potentially significant errors. Furthermore, 'definitely avoidable' ADEs cost the NHS £98.5 million annually and contribute to for 1708 deaths each year (Elliott et al., 2021). According to the World Health Organization (WHO), the global cost of medicine-related errors is estimated at $42 billion every year (World Health Organization, 2017). In response, the WHO launched "Medication Without Harm" - which aimed to reduce severe and avoidable medication-related harm by 50% globally by 2022 (World Health Organization, 2017).

In response to a growing population and limited healthcare resources, efforts are being made to efficiently maximise resource utilisation and minimise PIM use (NHS, 2019). One such way is through medicines optimisation, defined as:

> *'a person-centred approach to safe and effective medicines use, to ensure people obtain the best possible outcomes from their medicines.' (National Institute for Clinical Excellence, 2016)*

The premise of medicines optimisation is ensuring medicine use is clinically effective, cost-effective and that patients receive the right medicine at the right time and are involved in the process with healthcare professionals (HCPs). The principles of medicines optimisation are summarised in Figure 1. Medicines optimisation seeks to ensure prescribed medicines do not negatively impact a patient's experience i.e., through causing ADRs, are appropriate for the patient based on available evidence, are as safe as possible, and that these concepts are applied in routine practice. At the core of medicines optimisation is taking a patient-centred approach, which is about involving patients and their families/carers in their care to ensure the patients' treatment goals, preferences, concerns and beliefs are central to the prescribing decision process, facilitating shared decision-making (Coulter and Oldham, 2016). These principles look to counter the use of PIMs and so studies have looked to apply such concepts to reduce PIM use in a variety of clinical settings (Sandbæk et al., 2022, Saeed et al., 2022).

Figure 1 – The four principles of medicines optimisation sourced from NHS England (2013)

Due to the impact of the use of PIMs within healthcare, many potential interventions have been explored to tackle them. For example, a systematic review explored the effectiveness of interventions to reduce PIMs in older patients. The various strategies to reduce PIMs identified were medication review, educational strategies, clinical decision support system (CDSS), and organisational and multifaceted approaches (Rodrigues et al., 2022). Organisational strategies were policies developed to decrease PIM use, whilst multifaceted approaches were combinations of different interventions used. The study found that within hospitals, medication reviews were the most effective in reducing PIM use, whilst educational strategies were most effective in primary care. However, when only randomised controlled trials (RCTs) were analysed, the review did not find greater effectiveness of any interventions over others, whilst also noting the majority of RCTs contained methodological intervention limitations, limiting their replication within practice (Rodrigues et al., 2022).

Within such interventions, a key aspect of reducing PIM use is the cessation of a medicine that no longer benefits the patient or may be potentially harmful. As previously described, there are instances where a medicine may no longer be appropriate for a patient, such as due to the physiological changes associated with ageing. As such, it is important that these medicines are stopped in a timely fashion to avoid the risk of ADEs due to PIM use. Once a patient is prescribed a PIM, the only way to correct this is through deprescribing.

1.4. Deprescribing

1.4.1. Deprescribing definition

The term 'deprescribing' was first defined in 2003 by Woodward as:

> *'reviewing all current medications, identifying medications to be ceased, substituted or reduced, planning a deprescribing* regimen *in partnership with the patient and frequently reviewing and supporting the patient.' (Woodward, 2003, p. 323)*

When introducing the concept of deprescribing, Woodward hypothesised that deprescribing could be used to identify and stop the use of PIMs, preventing ADEs and medicine-related hospitalisations whilst improving patient adherence to medicines (Woodward, 2003). It was also emphasised that older patients are especially at risk of PIMs and so could benefit from deprescribing, however deprescribing should be in partnership with the patient and supplemented with frequent reviews and support (Woodward, 2003).

Since 2003, various new deprescribing definitions have emerged. Reeve et al., conducted a systematic review of deprescribing definitions in which 37 unique definitions were identified. Using eight characteristic themes derived from the 37 definitions, a new definition was proposed to aid future deprescribing research:

> *'Deprescribing is the process of withdrawal of an inappropriate medication, supervised by a health care professional with the goal of managing polypharmacy and improving outcomes.' (Reeve et al., 2015, p. 1262)*

Following this, a subsequent definition was developed by Scott et al., when introducing a model for deprescribing as:

‘ [A] *systematic process of identifying and discontinuing drugs where harms outweigh benefits within the context of an individual patient’s care goals, and their current level of functioning’* (Scott et al., 2015, p. 827).

This definition places emphasis on a patient’s care goals and current health status being pivotal to the decision to deprescribe. It places a heightened importance on patient factors influencing when to deprescribe, and so implies the involvement of patients in deprescribing. In summary, deprescribing is a process to taper or stop medicines that are no longer appropriate, considering patient’s treatment goals, preferences and coming to a shared agreement, to ensure patients remain on the optimal pharmaceutical regimen at all times.

To date, much of the deprescribing in clinical practice is reactive, such as withdrawing a medicine once a patient has developed ADRs (Anderson et al., 2017). There is a need for deprescribing of a proactive nature: reviewing patients’ medicines, identifying, and ceasing potentially problematic or non-indicated medicines before negative outcomes occur. Proactive deprescribing is valuable as it seeks to address problematic polypharmacy before patient safety is compromised (Anderson et al., 2017).

1.4.2. The process of deprescribing

Considering the growing need to reduce problematic polypharmacy, Scott et al., (2015) developed a 5-step protocol for deprescribing (Table 2).

Table 2 – The Deprescribing Protocol reproduced from Scott et al. (2015)

Key Step	**Detailed Processes**
1. Establish all the patients’ medicines and their indications.	Discuss with patients (and carers) about all their medicines (including prescribed and over the counter). Discuss with patients about medicines that have been prescribed but the patient is no longer taking.
2. Consider overall risk of medicine-induced	Assess the risk to patient according to:

harm in patient to determine the required intensity of deprescribing intervention.	• Medicine factors – number of prescribed medicines, use if high-risk medicine and ADR history. • Patient Factors – Age > 80 years, cognitive impairment, multi-morbidity, substance misuse, multiple prescribers, history of nonadherence.
3. Asses the eligibility of each medicine to be deprescribed: • No valid indication. • Part of a prescribing cascade. • Actual or potential harm of the medicine outweighs potential benefits. • Disease and/or symptom control medicine is ineffective, or symptoms have resolved. • Preventative medicine is unlikely to confer any patient-important benefit over patient's remaining life. • Medicines are imposing unacceptable treatment burden.	Identify medicines prescribed for a diagnosis that is in doubt, or confirmed diagnosis but in which evidence of efficacy is non-existent or provide no additional benefit after a certain period of continuous use. Identify medicines prescribed to counteract the adverse effects of other medicines. Reconsider the indications for initial problematic medicines or their substitution to an alternative medicine with superior tolerability. Identify medicines to avoid in older patients. Identify contraindicated medicines. Identify medicines causing well-known ADRs. Consider patients views on medicines effectiveness, medicines indications and if they would prefer to continue taking the medicine. Consider if non-pharmacological alternatives are available. Estimate patients' life expectancy using risk predication tools. Consider patients' expectations and preferences for medicine treatment e.g. current quality of life vs prolonging life. Identify medicines unlikely to provide benefit over patients' remaining life.

	Discuss patients medicine concerns. Identify medicines particularly burdensome to patients.
4. Prioritise medicines to be deprescribed.	Decide the order of deprescribing of medicines dependent on three criteria: • Those with the greatest harm and least benefit. • Those easiest to deprescribed e.g., less risk of withdrawal reactions. • Those that the patient is most willing to stop first (to gain buy-in to deprescribe other medicines). Suggested approach is to rank medicines from high harm/low benefit to low harm/high benefit and deprescribe the former in sequential order.
5. Implement and monitor deprescribing regimen.	Explain and agree with patient on management plan. Deprescribe one medicine at a time so hart harms and benefits can be attributed to specific medicines and rectified if needed. Wean patients off medicines more likely to cause adverse withdrawal effects and instruct patients on what to look out for and report if such events occur. Communicate plan to all HCPs and other relevant parities (family, carers) involved in patients care. Fully document reasons for, and outcomes of, deprescribing.

In essence, this 5-step process identifies PIMs and establishes their risk to patient safety, considers the patient's preferences and treatment goals, and formulates a plan with the patient to deprescribe each PIM sequentially. Although proactive

deprescribing might not always occur in this way, especially in instances where a particular PIM is deprescribed without consideration of the entire medicines regimen (as in Table 2) it does provide a framework HCPs can use to perform comprehensive medication reviews with patients with the focus of deprescribing. As a result, this protocol has been used as the basis of deprescribing interventions within the deprescribing literature (Visser et al., 2021).

1.4.3. Deprescribing safety

Despite the potential benefits deprescribing offers to patient safety, it is important to consider the potential risks in the process which must be considered along with the potential benefits when deciding whether to deprescribe (Reeve et al., 2014a).

Adverse drug withdrawal events (ADWEs) refer to instances where the discontinuation of a medicine leads to adverse physiological responses, characterised by the return or exacerbation of the underlying disease, recurrence of symptoms, or the emergence of new symptoms. A systematic review was conducted to examine the effects of discontinuing long-term medicines in RCTs conducted in primary care settings and included studies involved participants with a mean age ranging from 50.3 to 89.2 years (Thio et al., 2018).The review found that the success rates of medicine withdrawal varied widely, ranging from 20% to 100%. Additionally, reported rates of symptom relapse following withdrawal ranged from 1.9% to 80%. The substantial variation in these results could be attributed to the heterogeneity among the studies, including differences in the types of medicines being deprescribed, the ages of the participants, sample sizes, and duration of follow-up (Thio et al., 2018).

Overall, the review concluded that most studies indicated the safety of deprescribing long-term medicines, with the exception of a notable risk of symptom relapse. Such relapses can have an impact on the quality of life of individuals and potentially compromise patient safety (Thio et al., 2018).

1.4.4. Deprescribing effectiveness outcomes

The theoretical foundation supporting the benefits of deprescribing centres around the prevention of harms associated with PIMs, leading to a decrease in ADRs and an improvement in patient quality of life (Scott et al., 2015, Bemben, 2016). Furthermore, deprescribing, by reducing the medicine burden, directly alleviates the

treatment-related burden experienced by patients (McKean et al., 2016). As explained in 1.4.3, it is also vital that deprescribing is safe and so the risk of adverse effects resulting from deprescribing should be considered when exploring deprescribing benefit. These dimensions present multiple avenues for examining the effectiveness of deprescribing. Consequently, the effectiveness of deprescribing has been investigated in numerous experimental and quasi-experimental studies.

Ibrahim et al., (2021) conducted a systematic review to the assess effectiveness of deprescribing interventions in older adults living with frailty. The review included studies that focused on deprescribing interventions targeting older individuals with frailty and reported relevant outcomes such as medicine use, adverse events, functional status, and quality of life (Ibrahim et al., 2021). A total of six studies were included in this review which comprised of two RCTs, two pre- and post-comparison studies and two prospective interventional cohort studies.

Considering the primary outcome of safety, three studies examined the impact of deprescribing on ADEs. One pre- and post- comparison study, using the UKU Side Effect Rating Scale to quantify ADRs and ADEs, conducted a pharmacist-led deprescribing intervention in care home patients. This study found a significant decrease in potential ADRs (2.8, 95% CI; $p < 0.05$) and ADEs (2.24, 95%, CI; $p < 0.05$) from psychotropic medicines after 6 months. Another study in a hospital setting reported that 88% deprescribing recommendations were accepted and implemented without any reported ADEs during a 3-month follow-up period. Two multi-disciplinary team (MDT) led deprescribing studies in hospital and community settings did not show significant differences in unplanned hospitalisation and mortality rates (Ibrahim et al., 2021).

In terms of secondary outcomes, two studies explored the effects of deprescribing on frailty and function. Pharmacist-led deprescribing interventions in care home residents showed a decrease in frailty scores (mean difference of 1.35, 95% CI, $P < 0.05$), while a different study reported a positive correlation between PIMs and frailty. Additionally, a study on functional status demonstrated that patients in the deprescribing group had less functional deterioration compared to the comparator group (69.1% vs 34.4%, $p < 0.001$) (Ibrahim et al., 2021).

The impact of deprescribing on falls was mixed, with one study reporting a significant decrease in falls rate after deprescribing psychotropic medicines among care home patients, while another study did not find a significant difference in falls incidence. Two studies assessed cognition, depression, and mental status, with one

showing improvement in depression scores and the other reporting improvements in mental status and cognitive status after deprescribing. The effects on quality of life (QoL) were inconclusive, as no significant differences were observed in QoL scores before and after deprescribing interventions (Ibrahim et al., 2021).

Regarding medicine-related outcomes, all six included studies reported reductions in the number of medicines taken by older adults living with frailty after deprescribing interventions. The studies also highlighted decreases in PIMs and drug burden index (DBI) associated with deprescribing interventions (Ibrahim et al., 2021).

Overall, the systematic review indicated that deprescribing interventions in older adults with frailty lead to positive outcomes, including improved safety, reduced medicine use, and potential improvements in frailty, functional status, depression, and cognitive status. However, the impact on falls and quality of life required further investigation (Ibrahim et al., 2021).

The effectiveness and outcomes of deprescribing interventions have yielded mixed findings, as evidenced by a body of deprescribing literature. Omuya et al., (2023) conducted a systematic review examining the outcomes of deprescribing interventions specifically within the context of RCTs involving older adults across various healthcare settings. The review focused on deprescribing interventions that incorporated medicines reviews for older patients who were experiencing polypharmacy. A total of 14 RCTs were identified in which eight were in primary care or outpatient sites, two in community pharmacies, one in a hospital and three in nursing homes/long-term care facilities (Omuya et al., 2023).

Thirteen studies (92.9%) demonstrated the effectiveness of deprescribing interventions in reducing the number of medicines and/or doses taken. None of the studies identified any risks to patient safety in terms of primary outcomes, including morbidity, hospitalisations, emergency room visits, and falls. Among the studies that considered health-related quality of life as a primary outcome (four out of five), significant positive effects were observed in relation to deprescribing. Similarly, both studies that examined cost as their primary outcome reported significant reduction in medicine costs, as did two studies that considered medicine cost as a secondary outcome (Omuya et al., 2023).

In summary, there are numerous outcomes for which deprescribing effectiveness has been measured. Although there have been mixed findings on the impact of deprescribing on patient-related outcomes, such as quality of life, there are

consistent findings demonstrating deprescribing reducing PIM use and medicines burden. With numerous studies highlighting the feasibility to deprescribe, this makes deprescribing a viable process to reduce PIM use and problematic polypharmacy (Page et al., 2016).

1.4.5. Deprescribing guidance and resources

The growing interest in deprescribing as a strategy to address problematic polypharmacy has led to the development of various guidelines and resources aimed at facilitating this practice. Deprescribing tools and guidance can be broadly categorised into five types: general deprescribing guidance, generic deprescribing frameworks, drug-specific deprescribing guidelines, electronic clinical decision support systems (CDSS), and tools for identifying PIMs (Reeve, 2020). It should be noted that some resources may overlap and fall into multiple categories based on their content and nature.

General deprescribing guidance offers HCPs non-specific advice regarding deprescribing practices. These guidelines typically emphasise the importance of deprescribing in reducing PIMs, provide principles for identifying medicines suitable for deprescribing, and sometimes include a deprescribing process (Scott et al., 2015, Tilyard, 2010). Such guidance serves as a reminder to HCPs about the rationale behind deprescribing and offers considerations on how to implement it. However, the lack of specificity regarding which medicines to deprescribe and the lengthiness of some of these guidelines may limit their utility during patient-HCP interactions (Reeve, 2020). These generic deprescribing guidance can often be found in peer-reviewed journals, deprescribing-focused websites (e.g., deprescribing.org), and NHS-related websites.

Generic deprescribing frameworks share similarities with general deprescribing guidance, but they primarily focus on the deprescribing process itself. One commonly cited example is the 5-step deprescribing process outlined by Scott et al., (2015), which is presented in Table 2. While many frameworks follow similar steps, some may place greater emphasis on specific aspects of the process or its patient-centred nature. For instance, one framework highlights the importance of engaging patients throughout the deprescribing process and incorporating their perspectives (Reeve et al., 2014b).

Another type of deprescribing resource are drug-specific deprescribing frameworks, which provide guidance on deprescribing specific medicines or classes of medicines where deprescribing may be appropriate. These frameworks typically focus on medicines known to be PIMs and offer HCPs information on how to deprescribe them. They may also place more emphasis on aspects of the deprescribing process that are relevant to the specific medicine. For example, some guidelines concentrate on the tapering and monitoring of benzodiazepines, as sudden discontinuation of these medicines can lead to ADWEs (Pottie et al., 2018). Such guidance can be valuable for HCPs, offering clinical advice and considerations during the deprescribing process.

With the increasing adoption of electronic prescribing and medical records, several CDSS tools have been developed to provide deprescribing advice at the point of care (Reeve, 2020). These tools generate alerts within electronic prescribing software when a medicine with potential for deprescribing is detected. They also offer guidance on how to deprescribe and provide information on potential withdrawal symptoms to monitor (Cassels, 2017). Examples of electronic CDSS tools focused on deprescribing include TaperMD, MedSafer and PRIMA-eDS (Rieckert et al., 2020, McDonald et al., 2019, Mangin et al., 2023). These tools can be particularly valuable to HCPs by providing real-time recommendations and clinical advice related to deprescribing. However, it is crucial to note that many of these tools lack robust development and implementation evaluations, and may result in "alert fatigue" where HCPs become desensitised to safety alerts, rather than improved care (Reeve, 2020, Wright et al., 2018).

The last category of guidance includes tools for identifying PIMs, focusing on step 3 of the deprescribing protocol proposed by Scott et al., (2015) (Table 2). This step involves identifying medicines eligible for deprescribing, with PIMs often falling within this category. Validated tools previously described in 1.2.2.1, such as the Beers criteria and STOPP, are examples of this type of guidance. Masnoon *et al.,* (2018) conducted a systematic review to summarise the available prescribing assessment tools and criteria and their association with patient-related outcomes. A total of 42 tools were identified, of which 33 provided guidance on stopping PIMs. However, only 13 of these tools had undergone external validation, leading the review to conclude that more evidence-based and externally validated tools are needed (Masnoon et al., 2018). These tools can assist HCPs in identifying medicines suitable for deprescribing, but it is essential that they are based on sound evidence for their use.

1.4.6. Role of Healthcare professionals (HCPs) in deprescribing

A diverse range of HCPs have been involved, engaged, and participated in deprescribing literature. These professionals include doctors, nurse practitioners, medical specialists, and pharmacists. Although specific roles for HCPs have not been precisely defined, clinicians typically engage in the identification of eligible patients/medicines for deprescribing, the implementation of deprescribing processes (including gradual dose reduction and eventual cessation of medicines), and the monitoring of deprescribing outcomes. The involvement of various HCPs has both advantages and disadvantages. For instance, qualitative studies have revealed that patients are more likely to consent to deprescribing when it is recommended by their doctor (Reeve et al., 2013b). However, the time constraints faced by doctors may impose limitations on their ability to undertake deprescribing tasks optimally (Anderson et al., 2014).

Pharmacists have actively participated in numerous deprescribing studies, assuming diverse roles that encompass providing education regarding deprescribing to both patients and HCPs. They have also been engaged in conducting comprehensive medicines reviews, addressing the procedural steps outlined in Scott et al.'s deprescribing protocol (Table 2), and in some cases, assuming full responsibility for overseeing the entire deprescribing process (Clark et al., 2020, Martin et al., 2018, Jordan et al., 2022). There exists considerable variation in the roles and responsibilities attributed to pharmacists in the deprescribing literature. Consequently, further research is needed to ascertain whether specific HCPs should lead deprescribing efforts, defining their distinct roles and responsibilities, or whether a MDT approach offers the optimal framework for effective deprescribing strategies (Reeve et al., 2017).

1.5. UK policies on polypharmacy and deprescribing

The NHS Long Term Plan, a comprehensive policy document outlining strategic plans to address healthcare challenges, was released in 2019. This plan outlined the NHS's commitment to adopting a patient-centred service model, strategies to tackle health inequalities and polypharmacy, approaches to alleviate workforce pressures, advancements in digital technology, and steps for implementing the proposed strategies. A significant aspect of the plan involved the establishment of Primary Care Networks (PCNs), which are community-based multidisciplinary teams

comprising various healthcare professionals such as doctors, pharmacists, nurses, and care workers. The document also announced increased funding to expand the presence of clinical pharmacists within PCNs, recognising their valuable contributions towards medicines optimisation in primary care (NHS, 2019).

Subsequently, as a direct outcome of the NHS Long Term Plan, the Network Contract Directed Enhanced Service was implemented in 2020 which specifically laid out plans for structured medication reviews (SMRs) and medicines optimisation within PCNs. SMRs are evidence-based, comprehensive medication reviews that emphasise a holistic view of all aspects of patient health (Madden et al., 2022).

This contractual arrangement within the NHS, particularly in primary care settings, mandated PCNs to conduct SMRs as part of their responsibilities. Furthermore, PCNs were required to identify patients who would benefit from a SMR, specifically patients:

- In care homes.
- With complex and problematic polypharmacy, specifically patients taking ≥10 medicines.
- Taking medicines commonly associated with medication errors.
- With severe frailty, who are particularly isolated or housebound or who have had recent hospital admissions and/or falls.
- Using potentially addictive pain management medicines.

The contractual arrangement further emphasised the pivotal role of clinical pharmacists within PCNs in conducting SMRs. Consequently, primary care pharmacists were tasked with an increased responsibility to engage in SMRs with patients, particularly those who face challenges associated with polypharmacy. Given the central aim of SMRs to optimise medicine use, it was anticipated that these interactions would present opportunities for deprescribing interventions (Department of Health and Social Care, 2021).

In a recent publication by the Department of Health and Social Care titled "*Good for you, good for us, good for everybody*" a national report on overprescribing was presented. The report outlined a plan aimed at reducing overprescribing to enhance patient care and safety, support the NHS, and reduce carbon emissions (Department of Health and Social Care, 2021). The document underscored the burden imposed on the NHS by problematic polypharmacy and proposed strategies to address this issue, notably through medicines optimisation via SMRs and deprescribing. To support these initiatives, additional funding has been allocated for

the expansion of such services. The policy document also emphasised the importance of incorporating ongoing medication reviews and deprescribing practices into existing processes, integrating deprescribing training at all levels of healthcare education and professional development, and seeking additional information and insights to support effective deprescribing (Department of Health and Social Care, 2021).

In summary, the UK government, in collaboration with the NHS, has introduced significant changes in response to mounting concerns regarding problematic polypharmacy. The implementation of SMRs and the recognition of deprescribing as a means to address this issue have prompted an increased focus on understanding and implementing deprescribing practices within primary care in the UK.

1.6. Deprescribing implementation literature

Despite promising findings in the deprescribing literature, the implementation of deprescribing into routine clinical practice, particularly in primary care, remains limited. In a recent Bruyère Evidence-Based Deprescribing Guidelines Symposium, priorities for future deprescribing research were outlined by 30 participants including researchers, clinicians, policy makers, and stakeholders. The symposium emphasised the urgent need for implementation research in deprescribing, employing an implementation science perspective to explain how deprescribing can be effectively integrated into everyday clinical practice (Thompson et al., 2019). Several studies have echoed this sentiment, stressing the importance of gaining an enhanced understanding of the factors influencing deprescribing implementation (Wang et al., 2022, Scott, 2021). Such research is essential for advancing deprescribing literature beyond the sole focus on the deprescribing process, towards a comprehensive understanding of how this process can be successfully implemented across various clinical settings.

Parallel to the variability in HCP roles identified in the deprescribing literature (Section 1.4.6), the aforementioned symposium also highlighted the need to comprehend the specific contributions of each HCP in the practical implementation of deprescribing (Thompson et al., 2019). It is crucial therefore to understand the roles and responsibilities of HCPs in driving and sustaining this practice within clinical settings. This is particularly relevant to primary care, which has witnessed a substantial proportion of medicine-related errors, as discussed in Section 1.3.

While focusing on deprescribing implementation, it is equally imperative to ensure the safety of deprescribing implementation, given the inherent risks associated with it. Hence, future research must address how deprescribing can be implemented in primary care settings in a manner that prioritises patient safety and is embraced as routine practice.

1.7. Chapter summary

The ageing population, combined with the physiological effects of ageing, has resulted in individuals living longer with multiple co-morbidities. This, in turn, has led to an upsurge in the prevalence of polypharmacy and the associated complications arising from it. Consequently, there is an increasing emphasis on identifying and discontinuing PIMs before they give rise to ADRs, compromising patient safety and escalating healthcare costs. Deprescribing has emerged as a viable approach to address the issue of PIM use, as evidenced by its efficacy in reducing inappropriate medicine use. However, there is a paucity of evidence concerning the implementation of safe and routine deprescribing within current healthcare systems, especially in primary care.

The foundation of this doctoral research lies in advancing the understanding of deprescribing implementation. The primary objective of this research is to explore the question, “How can deprescribing be safely and routinely implemented within primary care?”.

Chapter 2 – Scoping review, rationale, aims and objectives

2.1. Background

Deprescribing is an important consideration in the total care plan for a patient. As outlined in the introduction, deprescribing has potential to benefit patient quality of life and avoid ADEs before they occur. As such, with polypharmacy and medicines use on the rise, primary care can attain value in the incorporation of routine and safe deprescribing into primary care. However, translating the benefits of deprescribing found within the literature into real-world healthcare comes with its own challenges. Healthcare research is known to produce large amounts of evidence that slowly diffuse into clinical practice, leaving a gap between research knowledge and practice (Kristensen et al., 2016). Hence, it is imperative to identify the essential elements of deprescribing research that are crucial for the successful implementation of routine and safe deprescribing within primary care.

One such component to investigate is the patient support needed during and after deprescribing. Preliminary work discussing deprescribing in primary care with Patient and Public Involvement and Engagement (PPIE) groups, conducted in the initial months of the doctoral training programme, highlighted patient support as a significant consideration when discussing implementation. This is replicated in the literature: a lack of patient support after stopping a medicine is known to be a patient barrier to deprescribing (Reeve et al., 2013b). This necessitates an examination of the parameters defining support in the context of deprescribing, as well as an assessment of the strategies for effectively integrating the required support for deprescribing within primary care. The latter assumes particular significance, as any support initiatives that encroach upon the existing workflow in primary care settings may hinder the successful adoption of routine deprescribing practices.

Similarly, another component to investigate is the patient education and clinician training needed to implement routine and safe deprescribing. The preliminary work with PPIE groups also introduced the idea that there may be misconceptions in relation to patient understanding of deprescribing. Discussions highlighted that patients may perceive deprescribing as an NHS ‘cost-cutting exercise’ or an abandonment of care. Such views may hinder the uptake of deprescribing in primary care through negative connotations associated with the practice. In conjunction, for routine deprescribing to be safe, it is important to consider any

training clinicians may need to provide this practice safely. Despite the potential inclusion of deprescribing within the realm of prescribing activities, its integration as a routine practice remains incomplete, resulting in HCPs potentially lacking the necessary readiness to produce such interventions.

A scoping review was chosen to collate the available literature surrounding deprescribing in primary care. A scoping review was selected as it allowed for examination of the extent and range of research about deprescribing in primary care currently available, identify research gaps in the literature and also determine the value of undertaking a full systematic review on the topic (Arksey and O'Malley, 2005). Although one of the fundamental themes of this project is the role of pharmacists in deprescribing, it was decided not to solely focus on pharmacists for the scoping review. This was to understand the broad literature on the topic and how deprescribing interventions have worked in primary care with different clinicians (including pharmacists). Through understanding the roles of multiple HCPs within deprescribing studies, it was hypothesised this would enhance the understanding of the role of pharmacists within such literature. This will provide a broad view initially, and further attention brought to pharmacists using the findings from the scoping review afterwards.

The review question for this scoping review was “What literature is available on patient support, education/training, and barriers and facilitators of implementation pertaining to deprescribing in primary care?".

The objectives were to:

- examine the breadth and depth of literature surrounding patient support needed post-deprescribing intervention (during follow-up) in deprescribing/withdrawal trials.
- examine the breadth and depth of literature concerning the type and nature of training and education provided in deprescribing studies.
- identify and examine literature on the barriers and facilitators to implementing a patient-centred deprescribing service in primary care.
- explore the necessity and feasibility of conducting a systematic review of the barriers and facilitators to implementing deprescribing in primary care.

2.2. Methods

2.2.1. Research question

The research question that governed this scoping review is “What literature is available on patient support, education/training, and barriers and facilitators of implementation pertaining to deprescribing in primary care?”. For the purpose of this review, deprescribing was defined using the definition produce by Scott et al., (2015), as defined in 1.4.1.

2.2.2. Search strategy

A search strategy was constructed with assistance from a librarian at the University of Leeds. This search was initially performed in MEDLINE and Embase to study the text words and their search results. Once all the relevant keywords were collected, the search strategy was revised, and the final search performed. The search was conducted in February 2020 with the time range 1996 – 2020 and the database accessed were The Cochrane Library, PubMed, Embase, MEDLINE, Web of Science and International Pharmaceutical Abstracts. An example of the MEDLINE search strategy can be seen in Table 3 and the full search strategy can be seen in the appendices (Appendix A)**.** The lower time range of 1996 was used to allow for withdrawal trials that do not mention deprescribing, as this was term was introduced in 2003 (Woodward, 2003). It was decided any articles published before this date were not likely to be relevant due to the emphasis of polypharmacy research generating from the year 2000 onwards**.** The reference lists of key studies were also assessed to identify relevant literature that was not identified through the database search.

Table 3 – Scoping review Medline search strategy

Medline	
#1	General Practice/
#2	Community Medic*.tw.
#3	deprescriptions/
#4	"Medic* withdrawal".tw.
#5	"Medic* Cessation".tw.
#6	Deprescrib*.tw.
#7	“Drug discontinuation”.tw.
#8	“Treatment withdrawal”.tw.
#9	“Stopping medic*”.tw.
#10	discontin* adj3 (medication* or prescription* or drug*)
#11	?Medic* adj2 (Cessation or stop*)
#12	Cessation of medic*.tw
#13	Stopping of medic*.tw
#14	Community Health Services/
#15	Primary Care.tw
#16	General Practice.tw.
#17	Primary Health Care/
#18	Community Dwelling .tw.
#19	1 or 2 or 14 or 15 or 16 or 17 or 18
#20	3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
#21	19 and 20
#22	Addiction.tw
#23	Hospital.tw
#24	21 not 22 not 23

2.2.3. Eligibility screening, inclusion criteria & exclusion criteria

A two-stage screening process was implemented to assess literature for relevance. Titles and abstracts were initially read and if relevant to the research question, were exported from the search into a Microsoft Excel® spreadsheet. At this stage, the inclusion criteria were:

- Primary literature discussing deprescribing in a primary care setting.
- Secondary literature discussing deprescribing in a primary care setting.
- Tertiary literature discussing deprescribing in a primary care setting.

This was not specific to any profession. Systematic withdrawal trials of problematic medicines in community-dwelling adults of any age were also included. This was to ensure clinical trials, where the terminology 'deprescribing' was not explicitly articulated but an appropriate deprescribing process was described, were included. Due to finite resources, only articles published in English were incorporated into this review. Literature discussing palliative care/life-limiting illness, patient self-discontinuation, withdrawal of medicines as a direct result of an ADR (i.e. reactive deprescribing), substance misuse studies and deprescribing in secondary or specialised care were not included.

Once this had been completed, a full-text screen was performed. The full texts of each abstract were accessed where possible and assessed for relevance towards the research question. At this stage, additional inclusion and exclusion criteria were used. In conjunction with the inclusion criteria previously described, it was added that literature examining views about deprescribing in primary care and conceptual literature discussing approaches to deprescribing in primary care were included. This was to allow breadth in the search strategy, aligning with the focus of the scoping review. Articles involving long-term care facilities such as nursing homes were excluded as this fell outside the remit of the doctoral research. Conference abstracts were also excluded at this stage due to the limitation of information able to be drawn from abstracts. The resulting articles were analysed for this scoping review. A full description of the inclusion and exclusion criteria can be seen in Table 4.

Table 4 – Scoping review inclusion and exclusion criteria

Title & abstract screening	
Inclusion criteria	**Exclusion criteria**
• Primary, secondary, and tertiary literature discussing deprescribing in a primary care setting.	• Palliative care/life-limiting illness' • Patient self-discontinuation, • Withdrawal of medicines as a direct result of an ADR • Substance misuse studies • Deprescribing in secondary or specialised care
Full-text screening	
Inclusion criteria	**Exclusion criteria**
• Literature examining views about deprescribing in primary care. • Conceptual literature discussing approaches to deprescribing in primary care. • Literature reporting or examining the withdrawal of medicines (including systematic withdrawal trials).	• Palliative care/life-limiting illness' • Patient self-discontinuation, • Withdrawal of medicines as a direct result of an ADR • Substance misuse studies • Deprescribing in secondary or specialised care

2.2.4. Data analysis

Once the relevant literature had been identified, this was then analysed according to the objectives of the scoping review. Specifically, each paper was analysed to identify the nature of deprescribing education and training utilised, the presence and nature of patient support offered to patients post-deprescribing and discussion of barriers and facilitators to implementing a patient-centred deprescribing service in primary care. Information related to such points were extracted, in conjunction with

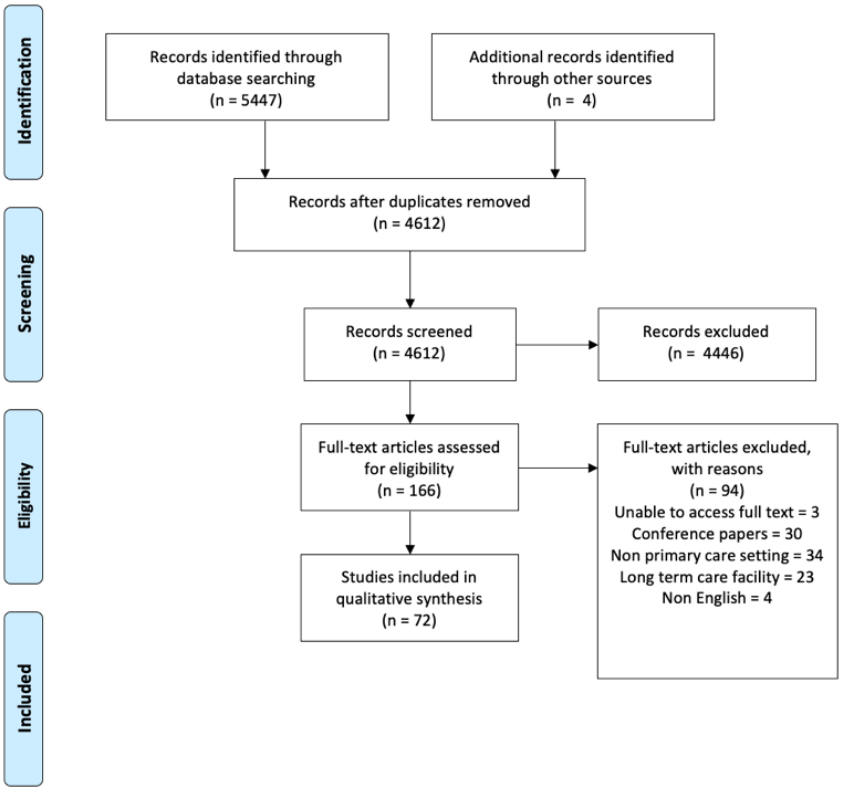
each paper’s characteristics, and the data were analysed using a narrative approach. This process was conducted by the researcher.

2.3. Results

2.3.1. Study selection

A total of 5451 articles were identified through the search strategy and additional reference lists. The results from each database were: Cochrane Library n=1124, PubMed n=768, Web of Science n=2461, Embase n=673, Medline n=332, and International Pharmaceutical Abstracts n=89. After the removal of duplicates, 4612 articles remained. Abstract screening resulted in 166 articles for the final full text screening, which in turn yielded 72 articles eligible for inclusion. Reasons for article exclusion can be seen in Figure 2.

Figure 2 – Scoping review PRISMA Flow Diagram



2.3.2. Study characteristics

A total of 32 out of 72 papers were evaluating an intervention (intervention studies), whereas the remaining 40 were qualitative studies and commentaries (non-intervention studies and commentaries) on various aspects of deprescribing in primary care. Each paper's characteristics can be seen in the appendices for intervention studies (Appendix B) and for non-intervention studies (Appendix C).

2.3.2.1. Intervention studies

A total of 12 out of 32 intervention papers were RCTs (Vicens et al., 2014, Martin et al., 2018, van de Steeg-van Gompel et al., 2009, Zitman and Couvée, 2001, Curran et al., 2003, Kuntz et al., 2019, Eveleigh et al., 2018, Choudhury et al., 2007, Tannenbaum et al., 2014, Clyne et al., 2015, Luymes et al., 2018, Campbell et al., 1999), six papers were subsequent follow-up of intervention trials (Martin and Tannenbaum, 2017, Vicens et al., 2016, Clyne et al., 2016, de Gier et al., 2010, Couvée et al., 2002, Gorgels et al., 2006), three papers were study protocols (Greiver et al., 2019, Vicens et al., 2019, Rieckert et al., 2019a), five were quasi-experimental studies (Anderson et al., 2020, Straand et al., 1993, Coyle et al., 2019, van Duijn et al., 2011, Gorgels et al., 2005), three were cohort studies (Ammerman et al., 2019, Prasad et al., 1997, Aylett et al., 1999), two were quality improvement projects (Walsh et al., 2016, Farrell et al., 2019) and one was a service evaluation (Odenthal et al., 2020). Study aims varied with studies investigating the clinical effect of deprescribing on patients (n=6), studies investigating predictors of partaking in medicine deprescription (n=3), however, the effectiveness of interventions on deprescribing was the most common aim (n=23). Excluding the six follow-up studies, intervention types were separated into provision of patient support (n=1), provision of patient education (n=5), clinician targeted interventions (n=8), general deprescribing without specific provisions (n=10), and use of a deprescribing tool (n=2).

Most studies were from the Netherlands (n=9), whilst five were in the UK. GPs were the most common healthcare professional for the focus of deprescribing interventions (n=17), followed by pharmacists who were involved in a significant proportion of studies (n=8), nurses were involved the least (n=1) and there were a small number of non-profession specific trials (n=3). The majority of studies focused on withdrawal of specific medicine classes (n=23), with benzodiazepines being the most prominent (n=12), followed by proton pump inhibitors (PPIs) (n=4), antihypertensives (n = 2), Z-drug hypnotics (n=1), antidepressants (n=1), non-benzodiazepine psychotropics (n=1), inhaled corticosteroids (ICS) (n=1) and diuretics (n=1). The overall age range of participants was from 18 years to no upper limit, with the older adult population of ≥65 years being the most frequently specifically recruited (n=7).

2.3.2.2. Non-intervention studies and commentaries

The majority of articles identified were surveys (n=19) (Reeve et al., 2018b, Gillespie et al., 2019, Sirois et al., 2017, Linsky et al., 2018, Zhang et al., 2018, Linsky et al., 2017a, Straand and Sandvik, 2001, Linsky et al., 2019, Martin and Tannenbaum, 2018, Cook et al., 2007, Gillespie et al., 2018, Kua et al., 2019, White et al., 2019, Carrier et al., 2019, Djatche et al., 2018, Ng et al., 2017, Mantelli et al., 2018, Omar et al., 2019, Turner and Tannenbaum, 2017), interviews and focus groups (n=8) (Nixon and Vendelø, 2016, Eveleigh et al., 2019, Middelaar et al., 2018, Nixon and Kousgaard, 2016, Korenvain et al., 2020, Anderson et al., 2017, Linsky et al., 2015, Schuling et al., 2012), followed by observational studies (n=2) (Turner et al., 2018, Luymes et al., 2016), narrative reviews (n=4) (Duncan et al., 2017, Antimisiaris and Cutler, 2017, Lader et al., 2009, Aguiluz et al., 2018), commentaries (n=3) (van Middelaar and Moll van Charante, 2018, Anderson et al., 2015, Peterson et al., 2018), a meta-ethnography (Bokhof and Junius-Walker, 2016), a Q-methodology study (Luymes et al., 2017), a process evaluation (Clyne et al., 2016), and a study that developed an evidence-based guideline (Farrell et al., 2017). The identified studies included explored the views and experiences of clinicians (n=12), patients (n=14) or both (n=3) around deprescribing, a process evaluation of an intervention study (n=1), development of a tool to promote clinician deprescribing conversation (n=1), and a content analysis of deprescribing conversations (n=1). Two articles originated from the UK whilst the majority originated from Canada (n=7), America (n=6), Australia (n=6) and the Netherlands (n=6) and the remaining from Chile, Ireland, Denmark, Malaysia, Switzerland, Singapore, Italy, France, Germany, and Norway. Surveys were the common tool used to collect data, with the Patients Attitudes Towards Deprescribing (PATD) (Reeve et al., 2013a) and Patients Perceptions of Discontinuation (PPoD) (Linsky et al., 2017b) as frequently utilised survey tools.

2.3.3. Key findings

2.3.3.1. Patient support at follow-up

Patient follow-up in intervention studies was classified into two categories:

1. Follow-up that was required to support the patient to safely and/or effectively withdraw their medicine (Support follow-up – SF)

2. Follow-up required to assess the effect of the intervention (Methods follow-up – MF)

This allowed for a distinction in terminology between patient follow-up that supports patients with the withdrawal of medicine, and follow-up required to report outcomes from the experimental and quasi-experimental studies. Using this classification, only six studies documented any nature of patient support follow-up, with one study exploring the nature of support follow-up as the component of the interventions of the study. Vicens et al., (2014) conducted a multi-centre three-arm cluster RCT investigating the efficacy of two structured interactions in primary care to enable deprescribing long-term benzodiazepines medicines. The study population were patients aged 18-80 years, taking benzodiazepines daily for at least six months and the study aim was to compare the interventions in effectiveness in withdrawing benzodiazepines. Patients within the intervention arm were randomised to receive written instructions about medicine withdrawal or scheduled a follow-up appointment every 2-3 weeks until the end of the dose reduction. This follow-up consisted of GP's reinforcing education material, reassuring patients regarding withdrawal symptoms and agreement for the next stage in dose reduction. The outcome saw both intervention arms three times more effective in discontinuing long-term benzodiazepines than usual care (Vicens et al., 2014).

The remaining five studies documented patient support during follow-ups to allow for clinical measurements e.g. blood pressure and symptom discussion (Choudhury et al., 2007, Luymes et al., 2018), or did not give information about the nature of support provided during follow-up (van Duijn et al., 2011, Coyle et al., 2019, Eveleigh et al., 2018). Follow-up to measure outcomes of the intervention typically lasted 6-12 months. However one study, which performed a large prospective controlled stepped care intervention to withdraw benzodiazepines in long-term users, maintained a 10 year follow-up period (de Gier et al., 2010).

2.3.3.2. Patient & clinician education/training

Study methods included patient education in 8 intervention studies in the form of verbal or written material for patients having their medicine withdrawn. This generally consisted of risks of the medicine being withdrawn, non-pharmacological alternatives and a tapering schedule. One noteworthy RCT in America investigated the effect of patient education alone and coupled with a pharmacist consultation on the rate of Z-drug discontinuation in 150 patients (50 patients per intervention arm

and control group). Patient education alone and patient education with pharmacist consultation led to 56% and 55% Z-drug discontinuation rate respectively compared to 26% in usual care. Subsequently, patients receiving education were 4.02 more likely to discontinue Z-drugs (adjusted odds ratio (OR) = 4.02, 95% CI = 1.66–9.77) whilst those receiving education and the pharmacist's consultation were 4.1 times more likely (adjusted OR = 4.10, 95% CI = 1.65–10.19), when compared to usual care. This study concluded that patients who received direct-to-patient education with/without a pharmacist consultation were significantly more likely to discontinue Z-drugs (Kuntz et al., 2019).

Two non-intervention studies also explored patient education. Turner et al., (2018) recorded conversations between primary care providers and 24 patients aged ≥65 years who were chronic PPI or benzodiazepines users and had been provided deprescribing patient education before or after their routine appointment. This qualitative observational study found that PPI users that had received an education brochure (about medicine risks, peer champion stories and medicine alternatives) before a GP visit had a higher frequency of patient-initiated deprescribing themes within their conversations compared to those who did not. These deprescribing themes were predominantly around medicines action and efficacy and the need for a follow-up (Turner et al., 2018). The other study, which employed surveys, utilised a similar patient education brochure on deprescribing to ascertain if providing this education compromises patient trust in their doctors or pharmacists. For the majority of patients, the provision of patient education led to no shift overall trust in their doctor (81.9%, 95% CI = 77.9–86.0) or pharmacist (81.6%, 95% CI = 77.5–85.7) six months after receiving the brochure (Zhang et al., 2018).

Education or training for clinicians was provided in the form of workshops discussing PIMs, deprescribing principles, the nature of the study involved in and tapering schedules. No study investigated the effect of GP education/training on deprescribing, however a study protocol was identified that described this (Vicens et al., 2019). An explorative, mixed method, quality improvement project, based in Canada, investigated building the capacity of community pharmacies to integrate deprescribing within their daily practice through training. Staff in four community pharmacies were trained to use deprescribing guidelines whilst multiple group meetings and documented Plan-Do-Study-Act (PDSA) cycles allowed the project team to appraise process improvements over time. Pharmacies in this study found that they could integrate deprescribing in their workflow, typically in the fashion of patient education, medication reviews and deprescribing recommendations to

prescribers, however their approaches and deprescribing goals varied between each pharmacy site (Farrell et al., 2019). Similarly, a non-intervention study that employed telephone interviews discussed clinician education when reviewing community pharmacists' current involvement in deprescribing. This came as a recommendation to utilise education to expand pharmacists understanding of deprescribing and enhance their involvement in the process (Korenvain et al., 2020).

2.3.3.3. Barriers and facilitators to deprescribing in primary care

A summary of the key barriers and facilitators found can be seen in Table 5 whilst all barriers and facilitators from each paper can be located in the appendices (Appendix D). Several studies focused on barriers and facilitators of deprescribing (n=4), however most non-intervention studies discussed these to some extent. Most studies reported patients' willingness to have a medicine deprescribed if their doctor recommended it. A significant proportion of patients had a desire to reduce the number of medicines taken (Linsky et al., 2015, Ng et al., 2017). However, a meta-ethnography highlighted that patients may value their medicine or see deprescribing as a sign of abandonment (Bokhof and Junius-Walker, 2016). The theme of fear relating to adverse reactions or relapse of symptoms was a common barrier with both patients and clinicians (Djatche et al., 2018, Eveleigh et al., 2019, van Middelaar and Moll van Charante, 2018), affecting GP's decision to deprescribe (White et al., 2019). This was also the case for GP's facing ambiguity (Nixon and Kousgaard, 2016) and uncertainty (Anderson et al., 2017). One review paper expressed how GPs would value organisational support to facilitate deprescribing (van Middelaar and Moll van Charante, 2018).

Barriers and facilitators for other clinicians besides GP's focused on pharmacists. Multiple review papers highlighted potential benefits community and practice pharmacists may provide to facilitate deprescribing, through addressing patient and prescriber barriers using medication reviews, exploring patient beliefs and providing deprescribing recommendations (Duncan et al., 2017, Anderson et al., 2014, Peterson et al., 2018). However, some pharmacists expressed a lack of knowledge about the patient (Anderson et al., 2017) and competing tensions within their community pharmacy prevented their involvement in deprescribing (Korenvain et al., 2020).

When investigating the barriers and facilitators of implementing a deprescribing study or intervention, it was evident that this was not routinely reported. Common barriers to implementation found were competing priorities (typically associated with community pharmacies), general unwillingness to deprescribe by patients, lack in clinician time and variation in intervention delivery. Many of the trials that utilised community pharmacy engagement noted a substantial number of pharmacies did not participate due to competing priorities which were not disclosed (Martin and Tannenbaum, 2017, Tannenbaum et al., 2014). In addition, there was a general unwillingness to have medicines deprescribed or patients would deviate from taper protocol in intervention trials, even when patients originally intended to comply with deprescribing recommendations (Eveleigh et al., 2018, Prasad et al., 1997, Walsh et al., 2016, Odenthal et al., 2020). Finally, variation in deprescribing delivery and advice given, despite a standardised study induction and training when provided, was also held partially accountable to difficulties implementing a deprescribing intervention (van Duijn et al., 2011, Clyne et al., 2015).

On the other hand, facilitators to implementation of deprescribing focused more so on workforce and resource components. These themes were supportive and motivated staff members, availability of a deprescribing resource and supporting components for the deprescribing process. Supportive and motivated staff members was documented as beneficial when implementing deprescribing, whilst the involvement of a GP in or co-designing the intervention further helped improve patient participation and GP's adoption of the intervention (Vicens et al., 2014, Anderson et al., 2020). The availability of a deprescribing resource, which aided deprescribing choice such as recommendations and tools that guided discussions, as well as supportive components for the deprescribing process such as EMR reminders and patient educative material were highlighted. These were documented as beneficial to clinicians in providing the intervention and therefore helped to improve the implementation of deprescribing in their respective study (Walsh et al., 2016, Farrell et al., 2019, Martin and Tannenbaum, 2017).

Table 5 – Barriers and facilitators to implementing deprescribing in primary care

Barriers	**Facilitators**
Competing priorities	Supportive and motivated staff
Patient unwillingness to deprescribe	Availability of a deprescribing resource
Lack of clinician time	Supportive elements in the process
Variation in intervention delivery	

2.4. Discussion

2.4.1. Patient support post deprescribing

The provision of patient support following deprescribing was underutilised, or at the very least, poorly documented in deprescribing trials. Most deprescribing trials did not document any patient support as part of their intervention, and those that did were very brief. The multi-centre three-arm cluster RCT conducted by Vicens et al., (2014) investigated the effect of consistent patient support in the form of multiple GP appointments to discuss symptoms and reinforce educative material during dose reduction. Although the intervention was three times more effective than usual care in discontinuing benzodiazepine use, there was no significant difference in efficacy with the other intervention arm that did not include such patient engagement and rather, substituted this with written instructions about the medicine withdrawal (Vicens et al., 2014). Furthermore, there is a legitimate debate regarding the adequacy of the support provided during the deprescribing process. Given that the support was limited to the period until the medicine had been completely discontinued, it is worth considering whether patients also require assistance after the cessation of a medicine. This additional support could encompass helping patients adapt to a new medicine regimen or ensuring ongoing monitoring to prevent the recurrence of symptoms. It is important to acknowledge that this does not diminish the value of consistent patient support during deprescribing, but rather raises questions about its significance and the optimal and feasible nature of such support for both patients and primary care clinicians. Notably, a notable gap in the existing literature lies in investigating whether the provision of patient support that extends beyond dose reduction has an impact on patient medicine relapse following deprescribing, as relapses are known to occur at a considerable rate (Thio et al., 2018).

The need for patient support post deprescribing has been expressed by patients and clinicians, including within discussions with PPIE representatives prior to conducting this review. The availability of clinician support and access to other support systems post withdrawal is a known patient enabler for deprescribing (Reeve et al., 2013b, Luymes et al., 2016). In addition, clinicians value additional help in monitoring patients post deprescribing and the inability to maintain any follow-up with patients to support a gradual process of deprescribing is discouraging for consultant pharmacists (Anderson et al., 2017, Linsky et al., 2017a). This is likely because of a perceived importance in the ability to offer patients some type of support during deprescribing.

Despite the favourable perception of patient support, the literature is currently lacking in terms of defining its specific components. The studies that have incorporated patient support either used this to take clinical measurements associated with the medicine being deprescribed and allow for symptom discussions with patients, or did not provide further details on the nature of support provided. Considering the potential risks of deprescribing and need for patient safety involving medicines discussed in Chapter 1, more work is needed to understand how best to maintain patients' safety following deprescribing, such as discussion on adapting to a new medicine routine or addressing potential patient anxiety once a medicine has been ceased. The provision of patient support can be regarded as a potential means to address patient apprehension and concerns surrounding deprescribing, offering a sense of reassurance and serving as a safety net for patients. On the other hand, the provision of patient support is likely to require increased HCP time and workload, which is already strained. Therefore, the feasibility of patient support must also be explored to ensure it can be incorporated into current systems. The benefits of an effective patient support system during deprescribing should not be overlooked and may help to make deprescribing a common and safe practice.

2.4.2. Use of education in deprescribing in primary care

The provision of education, whether patient or clinician focused, was used occasionally in studies included in this review. Interestingly, many studies that incorporated patient education in their intervention deprescribed medicines from a considerable proportion of patients (Kuntz et al., 2019, Tannenbaum et al., 2014, Aylett et al., 1999, Coyle et al., 2019, Walsh et al., 2016, Odenthal et al., 2020). This may be due to several reasons. Education on deprescribing has shown to increase patient-initiated deprescribing conversations (Turner et al., 2018), which may represent an increased interest to deprescribe. Education, coupled with the willingness to reduce medicines previously described, can equip patients with the necessary knowledge and motivate patients to attempt deprescribing. Also, efforts to involve patients in decision making to deprescribe are more effective than pharmacist-physician communication or prescribing software alerts alone (Martin et al., 2018). Shared decision-making allows for patients and clinicians to both engage in decision making, having discussed options, risks and benefits and taking patient preference into consideration. This is appropriate when evidence does not support a single clear superior decision which is often the case when deprescribing (Hoffmann et al., 2014). Furthermore, patient

preference has been shown to affect GP's willingness to deprescribe meaning that patient level factors relating to preferences and decision making must be addressed to enable effective routine implementation of deprescribing (White et al., 2019). This strengthens the need for shared decision-making in deprescribing conversations, however patients must also understand the concept of deprescribing, which may not always be the case (Turner and Tannenbaum, 2017). A lack of comprehension regarding the underlying rationale for deprescribing may lead patients to perceive it as a strategy aimed at cost reduction through withholding necessary treatments. This concern emerged during discussions with PPIE representatives, emphasising the potential necessity for patient education in this regard. Patients may also require education on deprescribing to trust deprescribing decisions and commit to the process of stopping a medicine. Little research has been conducted on patient education or how it should be delivered.

Clinician training was rarely utilised or discussed. In intervention trials, this took the nature of discussing the principles of deprescribing with clinicians or why a medicine should be the target for deprescribing. The act of stopping medicines is not novel and clinicians are likely to have experience withdrawing medicines from patients in the past, although this may have been more reactive in nature rather than proactive. Therefore, teaching clinicians about deprescribing may appear unimportant to some when designing deprescribing trials. With this being said, GPs have voiced their concerns regarding ambiguity concerning risks and benefits of deprescribing (Nixon and Vendelø, 2016, Anderson et al., 2017). Also doctors may not feel comfortable deprescribing guideline-recommended therapies and can be hesitant in deprescribing medicines initiated by another doctor or specialist (Djatche et al., 2018). Clearly, GPs may not always feel confident to deprescribe which may hamper deprescribing from happening. Subsequent investigations could potentially yield valuable insights by examining the impact of clinician deprescribing training on GPs' confidence levels in engaging in deprescribing practices, as well as assessing whether such training influences the rate at which deprescribing interventions are implemented.

The decision to deprescribe may have implications for a broader range of HCPs, social care professionals, and informal caregivers, including individuals responsible for medicine administration such as district nurses and patient caregivers. Consequently, it is crucial to ensure that all healthcare providers whose responsibilities are affected by deprescribing are adequately prepared to navigate this change in a manner that upholds patient safety and well-being. This, again, provides indication for deprescribing training for various healthcare and social care providers, as well as GPs. Future

studies should investigate training needs of relevant stakeholders to ensure deprescribing remains safe and effective in primary care.

The role of the pharmacist (community or general practice-based) in deprescribing was a topic explored in multiple studies and review papers (Anderson et al., 2014, Peterson et al., 2018, Korenvain et al., 2020, Anderson et al., 2017). The key area where pharmacist involvement may assist deprescribing was through medication reviews, using this to explore patients' beliefs about their medicines and educate them, and providing deprescribing recommendations to clinicians. However, other healthcare professionals have voiced a limited understanding of pharmacists' role in medicines management, which can vary widely across the world, whilst pharmacists' involvement in deprescribing is known to be affected by their own understanding of which medicines should be stopped and by whom. With these gaps in understanding, it is unrealistic to assume pharmacists can seamlessly integrate deprescribing tasks into their workflow without clinical guidance on deprescribing and defined roles that are understood by other clinicians involved in deprescribing. This provides another avenue in which training may be pivotal to pharmacists' ability to integrate in primary care deprescribing. Different grades and specialities of pharmacists may also conduct different roles based on their skills, which must be taken into account. A consensus has yet to be reached on the role of pharmacists in deprescribing in primary care. As recommended by Korenvain et al., future education (and training) for pharmacists should be developed and commissioned to expand pharmacists understanding of deprescribing and allow for clarity regarding their role in deprescribing.

2.4.3. Upcoming deprescribing research

The three study protocols captured in this review follow the same premise as the other withdrawal trials included, focusing on different interventions to reduce problematic medicines. Greiver et al., (2019) will evaluate the effect of practices working as a collaborative group that work with quality improvement coaches to review electronic medical records and develop and implement changes in medicine use. Vicens et al., (2019) will analyse the effectiveness of a GP targeted intervention that provides a workshop, feedback around prescribing practices and access to a support webpage. Reickert et al., (2019) will evaluate the effectiveness of a deprescribing tool that provides guidance on whether PPI deprescribing is recommended. Two of the protocols are medicine specific, focusing on PPIs and benzodiazepines respectively, whilst one protocol looks to target general problematic prescribing. It is interesting to

note that all three protocols emphasise patient and/or clinician education or training. One protocol describes using collaborative learning between practices, one protocol is providing an educational workshop to clinicians, feedback on their prescribing and an educational leaflet for patients and the final protocol provides training to GP's and nurses about shared decision-making and deprescribing and patient education on risks of their medicines (Greiver et al., 2019, Vicens et al., 2019, Rieckert et al., 2019b). These protocols show a positive direction in exploring the efficacy of patient education and clinician training on deprescribing and the unique ways of providing this. A theory-driven study, utilising patient education, may help to explain how best to educate patients on the nature of deprescribing, in order for them to engage in shared decision-making effectively.

2.4.4. Barriers and facilitators to implementing deprescribing in primary care

The identified barriers and facilitators to implementing deprescribing highlighted interesting themes. The lack of participation of community pharmacies due to competing priorities must be addressed if community pharmacies are to be incorporated into and support a deprescribing system (Farrell et al., 2019). Unfortunately, as these competing priorities were not discussed, it is difficult to deduce whether this was due to resource constraints such as time or due to differing strategic priorities. Similarly, Korenvain et al., (2020) demonstrated that deprescribing was perceived as conflicting with business/technical responsibilities due to the investment of time and losing revenue from dispensing as a direct result from deprescribing. This may provide some context as to why community pharmacies lacked participation in deprescribing research. However, adequately compensating pharmacies for deprescribing was said to help prioritise deprescribing in everyday practice (Korenvain et al., 2020). Therefore, it would be advisable to explore community pharmacy priorities and how this may align with deprescribing priorities, potentially through incentives that would address the revenue loss and guidance on time management when undertaking deprescribing related tasks.

The theme of general patient unwillingness to deprescribe was noteworthy due to conflicting with previous qualitative literature that have documented a willingness to stop a medicine if a doctor said this was possible. This theme included patients originally intending to comply with deprescribing recommendations but then opted out or deviated from the taper protocol. It was not reported in these studies why patients

deviated or opted out of deprescribing, however it is essential to maintain the reported patient willingness to deprescribe when introducing the idea to patients in primary care. This may be through determining how patients would want their medicines deprescribed if willing and addressing any concerns. This again highlights the worth of shared decision-making to incorporate patients' preferences into deprescribing decisions to understand and maintain their willingness to deprescribe. If not, patients may deviate from deprescribing protocols which may place them at a safety risk when deprescribing medicines that require a structured tapering regimen that should not be deviated from, such as selective serotonin reuptake inhibitors (SSRIs).

The final two barriers, lack of clinician time and variation in intervention delivery, are associated with organisational structure. Lack of clinician time as a barrier to deprescribing has already been reported in other studies and is expected due to deprescribing being perceived as a time-intensive process (Gillespie et al., 2018, Anderson et al., 2017). As GP time continues to be strained, additional new tasks as a result of deprescribing should avoid further deteriorating this or risks low collective action by clinicians, making it difficult for deprescribing to be normalised in practice (Murray et al., 2010). Variation in service delivery was associated with organisational factors such as different workloads or resources available (Clyne et al., 2015). Different primary care settings around the UK have variation in their workload, resources, staff, and Clinical Commissioning Groups (CCG) targets based on their location and the healthcare needs of the community they are embedded within. As a result, how different locations can feasibly and safely implement deprescribing with their current resources should be considered. In contrast, standardisation of aspects of the deprescribing process and the resources available to use may help target unwanted variation in intervention delivery. Some variation in intervention delivery in studies was associated to advice from individual nurses or GPs who may not have been fully convinced of the advantages of deprescribing (van Duijn et al., 2011). Clinician involvement will always be important when implementing a service as they will be the ones to deliver this. Without clinicians seeing the need for deprescribing, there is likely to be low cognitive participation resulting in deprescribing being underutilised (Murray et al., 2010). Therefore, it is imperative that clinicians understand the benefits that deprescribing offers as without this, patients will less be likely to see the value of deprescribing for themselves.

The facilitators to implementing deprescribing were mainly focused on healthcare staff and the resources available. There is no surprise that supportive and motivated staff help to implement deprescribing, as a motivated healthcare workforce is known to be

key in meeting the continuous demands of healthcare services (Ma, 2000). Co-designing a deprescribing intervention with GPs and the support of a GP also leads to improved patient participation and enhanced GP adoption of interventions (Anderson et al., 2020, Vicens et al., 2014). This highlights the central role and influence a GP has in deprescribing and primary care and directly with patients. GPs were the most common profession included in studies, which comes as no surprise as they are best suited to conduct the deprescribing process due to their continued care with their patients and access to complete and updated patient medical records. In addition, the already established relationship and trust between the patient and the GP may help to introduce the idea of deprescribing, which may provide reasoning to why many patients would have a medicine deprescribed if their doctor recommended doing so. Therefore, it would be helpful to receive the support of GPs when planning how to implement deprescribing into primary care.

The final facilitators were the availability of a deprescribing resource and supportive elements in the deprescribing process. When a deprescribing resource was available, such as a computer algorithm that provided deprescribing recommendations, this allowed for time efficient identification of at-risk patients and recommendations on how to proceed. This helps to address the lack of clinician time barrier previously discussed. Having an evidence based deprescribing tool is likely to increase clinicians confidence in applying deprescribing recommendations, which as previously discussed, may not always be present due to the ambiguity faced when stopping a medicine (Walsh et al., 2016). In addition, supportive elements such electronic medical record (EMR) reminders, on-site educative resources and deprescribing tools helped the implementation of deprescribing in studies. Working through uncertainties and the risk accompanied with this are substantial factors clinicians must consider when discussing deprescribing, due to the lack of direct evidence available. Going against the current prescribing pressures from clinical practice guidelines (CPGs) may feel like going against the grain when deciding to stop a medicine. It is important that clinicians are supported during deprescribing so that is safe and beneficial to the patients. In addition, the availability of readily accessible deprescribing resources is likely to influence how often deprescribing takes place, so in order to achieve routine deprescribing, clinicians' access to such resources should be reconsidered.

Many of the studies identified focused on the process of deprescribing, but very little explored implementing routine deprescribing in primary care, or utilised theoretical implementation science to enrich this. Although barriers and facilitators of a deprescribing process may also apply to implementing a deprescribing service, key

aspects such as organisational structure and resources, patient pathways and support networks, and incentives may be overlooked. The implementation of interventions that support a change in practice in primary care is complex and may fail to work in the context it was created for (Luig et al., 2018). In relation to deprescribing, this could result in the benefits of deprescribing not being realised or patient safety concerns during the process. Therefore, there is a need for literature that places a focus on how best to implement deprescribing in current primary care settings. Despite the identification of certain barriers and facilitators to deprescribing implementation in primary care in this review, it is important to acknowledge that this area remains significantly under-researched. Conducting a systematic review on this topic would be advantageous, as it would consolidate and deepen understanding of the factors influencing deprescribing implementation.

Additionally, it is noteworthy that the utilisation of theoretical implementation science to enhance the understanding of effective implementation of routine deprescribing in primary care is lacking. Poor implementation planning has led to a gap translating evidence into practice, hampering the uptake of complex interventions and may lead to the benefits of deprescribing not being realised (Lau et al., 2016). Hence, the application of implementation science theories in research is crucial, as it enables the identification and resolution of contextual barriers and facilitators, thereby promoting the adoption of innovative practices (Nilsen, 2015, Bauer and Kirchner, 2020). Using theory to understand barriers, develop and evaluate interventions and explore pathways has been advocated to advance the science of implementation research (Damschroder, 2020). Therefore, implementing deprescribing within primary care would benefit from a theoretical framework that focuses on implementation and evaluation of interventions. One such theory is the Normalisation Process Theory (NPT), which has been utilised throughout this doctoral research.

The role of pharmacists within deprescribing was discussed within multiple papers, however evidence for their optimal role is yet to be established. Pharmacists have shown an ability to facilitate or enact deprescribing in numerous ways with several deprescribing trials within primary care utilising pharmacist-led interventions to successfully and safely deprescribe medicines (Martin et al., 2018, Kuntz et al., 2019, Ammerman et al., 2019, Odenthal et al., 2020). Pharmacists often conducted medication reviews, provided deprescribing recommendations to clinicians and educated patients on the risks and benefits of their medicines. It is important to consider which type of pharmacist, in what setting, and with what skills, knowledge and qualifications should be involved. Community pharmacists and primary care

pharmacists may offer different inputs, based on their skills, ability, prescribing privileges, and access to patient records. Introducing Primary Care Networks (PCN) as part of the NHS Long-Term Plan has provided a new role for PCN pharmacists who will conduct Structured Medication Reviews (SMRs) including deprescribing within a clinic setting. Community pharmacists have also demonstrated an ability to integrate deprescribing within their routine workflow through building staff capacity to identify patients for deprescribing, the pharmacist assessing opportunities to deprescribe, providing deprescribing recommendations to clinicians and continued follow-up and monitoring of patients (Farrell et al., 2019). Community pharmacists are an integral part of current primary care systems, especially as they have frequent contact with patients and their medicines as a result of the NHS repeat dispensing service, Discharge Medicine Service (DMS), and recently commissioned services in minor ailments and emergency medicines supply. As suggested by Korenvain et al., (2020), defining the pharmacist's role within deprescribing in primary care, and training pharmacists on how to integrate deprescribing within their practice would facilitate optimal pharmacist involvement.

Through this scoping review, it became apparent that there were valuable insights that could be gained from the barriers and facilitators of the implementation of deprescribing interventions in primary care. This was evidenced through the publication of the scoping review abstract (Okeowo et al., 2022). While the extraction of these insights was occasionally nuanced, a multitude of trials focusing on medicine withdrawal elucidated aspects that either impeded or facilitated the withdrawal process. However, it was noteworthy that a discernible gap exists in the body of deprescribing literature, where there is a lack of cohesive and comprehensive literature reporting the barriers and facilitators to deprescribing implementation.

The results of this scoping review consequently suggested that conducting a systematic review in this domain would yield significant insights. By doing so, this would provide a comprehensive understanding of the evidence base concerning barriers and facilitators to deprescribing implementation in primary care. This, in turn, would better inform the subsequent doctoral research and provide the needed literature to the deprescribing evidence base collating the barriers and facilitators to deprescribing implementation in primary care.

2.5. Conclusion

Deprescribing has been shown as effective and worthwhile process to combat problematic polypharmacy in primary care. The growing interests in the discipline of deprescribing understandably parallels the growing consumption of medicines in our healthcare. Although there is emerging literature discussing deprescribing support, education and training, more research is needed to determine how best to support patients and provide education and training to stakeholders involved. Furthermore, there is a lack of available literature exploring how to implement deprescribing safely, effectively, and feasibly into routine practice in primary care, especially using the theoretical lens of implementation science. In addition, the role of healthcare professions, especially pharmacist, must be outlined to ensure the best care for patients.

2.5.1. Implication for research

This review investigated distinct elements that would be needed to routinely deliver deprescribing in practice as opposed to solely investigating the deprescribing process. Future research should look to build on this through:

- Addressing patient support needed during deprescribing, and what benefits/drawbacks accompany this.
- How clinicians will need to be trained to provide deprescribing in a routine and safe manner.
- How to implement deprescribing in primary care system within the UK and normalise this practice. This should be supported by implementation science theory to enhance understanding of contextual factors.
- The role of pharmacists in deprescribing in primary care.

2.6. Rationale for doctoral research

In summary, much of the current evidence on deprescribing within primary care is limited. The literature focuses on the process of deprescribing and its effectiveness, but little attention has been placed on its implementation. Key aspects of a deprescribing system, such as patient support and education/training necessary, have yet to be established. The role of pharmacists has shown potential, but clarity is lacking on the optimal nature of this role. Without these fundamentals, the benefits of deprescribing may not be realised within primary care. This highlights a need for research focused on the optimal implementation of a safe deprescribing system within current healthcare infrastructure, underpinned by suitable a theoretical approach for clarity regarding why deprescribing may or may not be normalised.

This PhD looks to bridge this gap in knowledge, through exploring vital aspects of proactive deprescribing implementation, and seeking further lucidity on the role of pharmacists within deprescribing. The older adult population (≥65 years old) will be the focus of the project, due to their increased exposure to problematic polypharmacy discussed in Chapter 1. Through being underpinned by NPT, this PhD intends to provide evidence on deprescribing that can be translated into practice and compliment future NHS strategies. This is so that patients may benefit from normalised and safe deprescribing practice to combat problematic polypharmacy.

2.7. Aims

This PhD aims to identify the barriers, facilitators, and effective strategies to safe implementation of deprescribing in primary care. Resources to support the safe implementation of deprescribing will then be designed using NPT to normalise this practice in primary care.

2.8. Objectives

1. To systematically review and synthesise existing evidence regarding the barriers and facilitators associated with the implementation of proactive deprescribing in primary care, utilising the theoretical framework of Normalisation Process Theory (NPT).
2. To explore the key implementation factors required for the safe and routine deprescribing in primary care, with a specific focus on the roles of pharmacists in the deprescribing process. This will be achieved through qualitative

interviews and focus groups conducted with patients and healthcare professionals underpinned with NPT.

3. To co-design resource(s) to support safe and routine implementation of deprescribing in primary care with patients and healthcare professionals.

Chapter 3 – Methodology

The purpose of this chapter is to discuss and explain the methodological approach taken during this research. This involves understanding the ontological, epistemological, and theoretical perspective of the research including the role that Normalisation Process Theory (NPT) has played in underpinning the research. Although NPT was chosen as a suitable theory to serve as the backbone of this research, other theories were considered, which will be further explained in this chapter. In addition, the approach taken to Patient and Public Involvement and Engagement (PPIE) during this research will also be discussed.

3.1. Methodological approach

The methodological framework adopted in this doctoral research, as well as the subsequent theories and methods employed, is important in understanding how data are generated. Consequently, careful consideration must be given to the philosophical assumptions underpinning this research, which reflect the researcher's stance on the nature of knowledge, particularly in terms of ontology and epistemology. Ontology pertains to the understanding of social reality, whilst epistemology is the theory and nature of knowledge within a particular discipline (Bryman, 2016).

Within the realm of ontology, three paradigms have been explored, namely objectivism, constructivism, and pragmatism. Objectivism suggests that reality exists independently of the knowledge and consciousness of social actors (Crotty, 1998). In contrast, constructivism theorises that reality emerges as a result of the interactions and actions of social actors within it (Bryman, 2016). Pragmatism perceives reality as dynamic and capable of fluctuating between a singular objective reality (as in objectivism) and multiple realities (as in constructivism) (Kaushik and Walsh, 2019).

Moreover, understanding how the ontological approach informs epistemology in research is crucial. Positivism advocates for the application of methods derived from the natural sciences to study phenomena in various fields, aligning with an objectivist ontological stance (Grix, 2002). Interpretivism, in contrast, places emphasis on understanding the subjective meanings inherent in social actions in order to acquire knowledge, and is typically employed in conjunction with a constructivist ontological approach (Grix, 2002). A pragmatic epistemological approach advocates for the utilisation of appropriate methods that are best suited to address a particular research question, thus aligning with a pragmatic ontological perspective (Tashakkori and Teddlie, 1998).

Lastly, it is imperative to acknowledge the impact of the epistemological approach on the role of theory in research. Theoretical perspectives are commonly categorised as deductive, inductive, and iterative. A deductive theoretical approach initiates with a pre-existing theory or set of hypotheses, which are then subjected to empirical examination through research to either validate or refute the theory and make necessary modifications (Bryman, 2016). A deductive theoretical approach associates with a positivist epistemology and an objectivist ontology.

In contrast, an inductive theoretical approach generates theories or hypotheses as outcomes of the research process, following data collection and analysis methods (Bryman, 2016). An inductive approach is often accompanied by an interpretivist epistemological approach and a constructivist ontology. Conversely, an iterative theoretical approach entails a dynamic interplay between data and theory, incorporating elements from both deductive and inductive perspectives (Bryman, 2016).

To summarise, the ontological position adopted in the research significantly influences the epistemological approach undertaken, which, in turn, affects the theoretical perspective embraced. The ontological and epistemological perspectives were considered, which can be seen in Table 6.

Table 6 – Summary of the research ontological, epistemological, and theoretical paradigms considered (Yvonne Feilzer, 2010, Bryman, 2016)

	Objectivism	**Constructivism**	**Pragmatism**
Ontology	Single objective reality that can be measured and understood	Multiple realities are created and continually negotiated by individuals	Singular and multiple realities open to empirical enquiry
Epistemology	Positivism – knowledge gained through objective-free methods	Interpretivism – knowledge gained through understand the subjective meaning of social actions	Pragmatic – knowledge gained through diverse approaches
Theoretical perspective	Deductive	Inductive	Iterative

A pragmatic ontological and epistemological paradigm was employed for this research, given the applied nature and real-world context. The research was conducted in a complex environment where diverse perspectives needed to be taken into account. By adopting a pragmatic approach, the study was able to flexibly employ different methodologies to explore multiple perspectives and address practical issues (Yvonne Feilzer, 2010).

The pragmatic paradigm allowed for the integration of mixed and multi-method approaches, enabling the exploration of qualitative and quantitative data and methods that were appropriate for addressing the research question (Bryman, 2016). This flexibility provided freedom in selecting the most suitable methods to gather and analyse data.

The research was conducted within the context of the NHS, a complex healthcare system involving various stakeholders, including patients, healthcare professionals, policy makers, and government entities (McKee et al., 2021). Deprescribing, a complex intervention, requires the involvement of multiple entities undertaking various tasks to achieve positive outcomes and avoid adverse effects (Avery and Bell, 2019). The pragmatic approach facilitated the consideration of multiple perspectives in addressing the research question (Tashakkori and Teddlie, 2010). This approach acknowledged the complexities inherent in the research context and allows for the incorporation of diverse viewpoints, contributing to a comprehensive understanding of the topic. By adopting a pragmatic paradigm, this study was able to navigate the complex healthcare system and provide insights into deprescribing from a variety of perspectives. Pragmatic approaches to research has long since been seen to add value to clinical research, through appreciation of the complexities of real-world environments (Tunis et al., 2003)

The role of theory in this research exhibited both inductive and deductive properties, reflecting an iterative approach. Inductively, the research aimed to generate findings on the implementation of safe and routine deprescribing in primary care through data collection, observations, and analysis (Goddard and Melville, 2004). Deductively, implementation theory was employed from the outset of the research to guide the research process, including the coding of data using pre-existing coding frameworks (Braun and Clarke, 2006). This iterative movement between data and theory is a characteristic feature of iterative research approaches and was well-suited to address the doctoral research questions (Bryman, 2016).

The selection of appropriate research methods was guided by the specific objectives of each study. Qualitative methods were employed to explore the nature of deprescribing in primary care and investigate the potential roles of pharmacists in collaboration with patients and various HCPs. This approach allowed for a deep and rich examination of the complexities involved in deprescribing, including considerations for safety and implementation within the primary care setting (Busetto et al., 2020). Qualitative research is well-suited for gaining an in-depth understanding of complex issues, such as the implementation of safe and routine deprescribing in UK primary care (Almeida et al., 2017).

Quantitative methods were employed to quantify the barriers and facilitators associated with implementing deprescribing in primary care across different constructs of the NPT. This quantitative analysis revealed a notable gap in knowledge regarding the appraisal of deprescribing, as indicated by the relatively low number of barriers and facilitators attributed to reflexive monitoring compared to other constructs of NPT. Furthermore, the systematic review in Chapter 4 also dealt with quantitative deprescribing literature. Therefore, the use of quantitative methods allowed for the identification of patterns within the deprescribing literature, thereby contributing to a more systematic understanding of the topic.

The combination of qualitative and quantitative methods offered complementary insights into deprescribing, facilitating a comprehensive and nuanced examination of the subject matter. The qualitative component provided a rich understanding of the complexities and nuances of deprescribing, while the quantitative component enabled the identification of trends and patterns within the literature. By employing both qualitative and quantitative approaches, this research was able to address the research questions from multiple perspectives and enhance the overall understanding of deprescribing in primary care. As a result, the research was classified as multi-methods, where the collection and analysis of both quantitative and qualitative data occur but are not typically integrated with each other (Creswell, 2011).

Co-design methods were selected as the approach to develop the intervention resulting from this research. Co-design is a well-established method that emphasises collaboration between designers and end users in the development of products and services, a concept that has long been employed in the fields of marketing and Information Technology (IT) (Lee, 2008). Central to co-design is the inclusion of various stakeholders in the design process, seeking their active participation in related activities (Steen et al., 2011). This approach facilitates idea generation, knowledge

sharing, and a focus on end users' needs, ultimately leading to improved service quality and more successful innovations (Steen et al., 2011, Antonini, 2021).

In recent years, co-design methods have gained traction in healthcare research. A significant portion of medical research funding is deemed as becoming avoidable waste, with one of the key contributors being studies that address questions of limited relevance to HCPs, patients, and other end users (Chalmers and Glasziou, 2009, Ioannidis, 2016, Slattery et al., 2020). There is a pressing need to align research priorities with those of patients and HCPs whose work is directly impacted by research outcomes, to avoid the wasting of valuable resources. Co-design addresses this misalignment by involving individuals with lived experiences related to the research question and harnessing their insights to inform future innovations. While recognising the potential knowledge limitations of those involved, co-design leverages the practicality and legitimacy derived from multi-stakeholder dialogue (Palmer et al., 2019). This pragmatic approach utilises the experiences and collaboration of individuals to address real-life problems, aligning well with the pragmatic ontological and epistemological positioning of this research (Steen, 2009).

Framework analysis served as the designated method for data analysis in the qualitative research in Chapters 5 and 6. This analytical approach is oriented towards the identification of shared patterns and differences inherent in qualitative data. It subsequently focuses on the intricate relationships between diverse components of the data, thereby drawing descriptive and/or explanatory conclusions clustered around themes (Gale et al., 2013). The principal advantage underpinning the adoption of framework analysis within this research lay in its clear, step-by-step process. This analysis method systematically guided the management and conceptual organisation of data, offering a structured model that seamlessly accommodated the complexities of the research process (Gale et al., 2013). This provided the doctoral researcher with clear steps to conduct data analysis in a robust and systematic manner.

Figure 3 – Summary of research methodology

Ontology
Pragmatism: Singular and multiple realities open to empirical enquiry
Epistemology
Pragmatic: Knowledge gained through diverse approaches
Theoretical perspective
Iterative: Theory used to guide research whilst new knowledge is generated from research
Nature of research
Study 1: Systematic review – Incorporating quantitative and qualitative data
Study 2: Focus groups and interviews – Qualitative
Study 3: Co-designing deprescribing implementation resources – Co-design

3.2. Use of implementation science as a guiding theory

As outlined in Chapter 2, there is a notable research gap in the field of deprescribing, particularly regarding its implementation and the application of implementation science. This gap has contributed to a knowledge-practice gap in healthcare, where a disconnect exists between scientific knowledge and its practical application in routine care (Westerlund et al., 2019). Consequently, there is a need for implementation science to provide insights into the complex process of implementing healthcare interventions. Implementation science can be defined as follows:

> "*The scientific study of methods to promote the systematic uptake of research findings and other evidence-based practice into routine practice and improve the quality and effectiveness of health services*" (Eccles and Mittman, 2006, p. 1).

The incorporation of implementation science in healthcare research is highly recommended as it offers a comprehensive understanding of the contextual factors influencing intervention adoption, thereby enhancing the uptake of interventions (Bauer and Kirchner, 2020, Westerlund et al., 2019). However, the abundance of implementation models, frameworks, and theories available poses a challenge in selecting the most appropriate one (Birken et al., 2017). The following section explores

the various implementation theories considered and provides rationale for the chosen theory.

3.2.1. Normalisation Process Theory

Normalisation Process Theory (NPT) is a theoretical framework focused on the routine implementation of complex interventions into everyday practice. It is a middle-range sociological theory that conceptualises the implementation, embedding, and integration of innovation in healthcare settings (May et al., 2009). NPT is a theory of action that focuses on the work people do, as opposed to cultural transmission of innovation seen in other theories such as Diffusion of Innovation theory.

NPT was initially developed as an applied theoretical model known as the Normalisation Process Model (NPM). This model supported the understanding and evaluation of factors that act as barriers or enablers to routine incorporation of complex interventions into practice, yet it did not address how stakeholders understand, engage with, and evaluate innovations (Huddlestone et al., 2020). It was later improved with the development of three additional constructs to account for how stakeholders understand/make sense of, engage and participate with, and reflect and appraise an intervention (Finch et al., 2012). Thus, NPM became NPT.

The four components; coherence (or sense-making); cognitive participation (or engagement); collective action (work done to enable the intervention to happen); and reflexive monitoring (formal and informal appraisal of the benefits and costs of the intervention) can be used in the development and/or evaluation of complex interventions. Each construct has a dynamic relationship with each other and the wider context of the intervention itself. The constructs of NPT can each be divided into 4 additional sub-constructs, which can be seen in Table 7.

Table 7 – Definitions of the subconstructs of NPT adapted from Huddlestone et al. (2020)

Construct	Subconstruct	Definition
Coherence (Sense-making)	Differentiation	Understanding how an intervention differs from others.
	Communal specification	A shared understanding of the aims, objectives, and benefits of an intervention.
	Individual specification	An individual understanding of their specific tasks and responsibilities around an intervention.
	Internalisation	Understanding the value, benefits, and importance of an intervention.
Cognitive participation (Relationship work)	Enrolment	Individual “buy in” to the intervention.
	Activation	Individual sustaining their involvement with the intervention.
	Initiation	Key individuals driving the implementation of the intervention.
	Legitimation	Individual belief that it is right for them to be involved in the intervention.
Collective action (Enacting work)	Interactional workability	The interactional work that people do with each other, with artefacts and with other elements of the intervention when they look to operationalise them in everyday settings.
	Relational integration	The knowledge work that individuals do to maintains confidence in an intervention.
	Contextual integration	The resource work needed to manage an intervention through the allocation of different kinds of resources and the executions of protocols, policies and procedures.

	Skill set workability	The allocation work underpinned by division of labour built around an intervention as it's operationalised in practice.
Reflexive Monitoring (Appraisal work)	Reconfiguration	How individuals or groups attempt to redefine the intervention.
	Individual appraisal	How individuals appraise the effects of the intervention on them and their work environment.
	Communal appraisal	How groups judge the value of an intervention.
	Systematisation	How the benefits or problems of an intervention are identified.

The application of NPT in healthcare research has expanded beyond its original focus on e-health and tele-health evaluation. Its utility in analysing implementation processes and informing recommendations for future implementation work is increasingly recognised by researchers (McEvoy et al., 2014). NPT provides a conceptual framework that explains implementation processes and informs study design and data analysis across various research methods (May et al., 2018).

NPT was selected as the appropriate theory to guide this research due to its emphasis on engaging multiple stakeholders and understanding their efforts to normalise an intervention. This aligns well with the aim of this research, which focuses on implementing safe and routine deprescribing in primary care involving various actors such as patients, domiciliary carers, GPs, pharmacists, and nurses. Additionally, considering the primary care context, NPT is recommended for its adaptability and responsiveness to diverse primary healthcare settings (de Brún et al., 2016). The presence of NPT constructs and sub-constructs provides a theoretical foundation for identifying specific elements of an intervention that can be enhanced to facilitate its normalisation. NPT has been increasingly employed to study the implementation of complex interventions in healthcare, particularly in primary care settings, and has been characterised as a flexible framework applicable at different stages of research to understand implementation dynamics (Tazzyman et al., 2017). This flexibility aligns

with the pragmatic nature of this research, aiming to utilise the most appropriate methods to address the research question.

In summary, the implementation-focused nature of NPT was deemed suitable for providing insights into current deprescribing implementation challenges and identifying strategies to enhance normalisation in primary care. It offers valuable understanding of the relationships and work required to normalise an intervention in practice, which is both novel and necessary in the field of deprescribing research. Furthermore, its flexibility allows the researcher to adapt and apply the theory as deemed fit to address the doctoral research question. Nonetheless, it is important to acknowledge the existence of other implementation theories, frameworks, and models that could have also been considered.

3.2.2. Other theories, frameworks and models considered

As previously discussed, the literature encompasses a wide range of implementation science theories, models, and frameworks (Birken et al., 2017). Given their potential relevance to this research project, several options were carefully considered. The subsequent section examines three notable candidates: The Systems Engineering Initiative for Patient Safety (SEIPS) model, Diffusion of Innovation theory, and The Behaviour Change Wheel.

3.2.2.1. Systems Engineering Initiative for Patient Safety 1.0, 2.0 & 3.0

The Systems Engineering Initiative for Patient Safety (SEIPS) model is a descriptive model that examines work systems and their impact on patient safety. Drawing on engineering concepts, the SEIPS model integrates human factors and healthcare quality models to explain how the design of a work system can influence employee and organisational outcomes, as well as patient safety (Carayon et al., 2006). Within this model, individuals (including patients, HCPs, and other employees) perform tasks using various tools and technologies within a specific physical environment and under organisational conditions. These factors dynamically interact through different processes to produce outcomes such as performance, safety and health, and quality of working life. In summary, the SEIPS model offers a systems approach that identifies relevant factors within a system pertaining to the topic under investigation, such as the implementation of new policies and patient safety research. However, it is important to note that while the SEIPS model provides insights into how work systems affect health-

related outcomes and can guide research and improvements, it is not explicitly an implementation model (Holden and Carayon, 2021).

The SEIPS model has undergone further development and modification to produce SEIPS 2.0. In this updated version, the model incorporates the representation of patients, healthcare professionals, and other relevant groups and individuals under the 'person(s)' component (Holden et al., 2013). Additionally, more emphasis is placed on the 'external environment' component, which encompasses societal, economic, ecological, and policy factors beyond the organisation. Furthermore, adaptions in outcomes to the work system are accounted for, considering factors such as anticipation/unanticipated nature, short/long-lasting impact, and intermittent/regular occurrence.

The most recent iteration of the SEIPS model, SEIPS 3.0, further expands on the complexities of the 'process' component. It focuses on the patient journey and their spatial-temporal interactions with different HCPs, friends, and family throughout their care (Carayon et al., 2020). In essence, the SEIPS 3.0 model examines patient safety over time and in various contexts. Additionally, a feedback loop is introduced to capture learning and improvements derived from outcome evaluation and the adaptation mechanisms previously outlined in the SEIPS 2.0 model.

The SEIPS model provides a comprehensive framework for examining work systems and identifying factors that may influence patient safety, including aspects related to deprescribing implementation. However, it does not offer guidance on whether changes in specific factors within the work system lead to particular patient outcomes, nor does it explicitly address intervention implementation, which is a focus of this research (Carayon et al., 2006). In contrast, NPT's constructs and sub-constructs directly contribute to the normalisation of interventions, influencing their potential for successful implementation. This emphasis on implementation gave NPT a theoretical advantage over the SEIPS model for this particular research. Nonetheless, this does not diminish the value of the SEIPS model, as it remains a suitable framework when investigating patient safety.

3.2.2.2. Diffusion of innovations

Diffusion of Innovations theory, originally introduced by Professor Everett Rodgers in his book "Diffusion of Innovations" in 1962, aims to explain the process of adopting new innovations and technologies. This theory focuses on the perception of an

innovation as new or unfamiliar within a social system and the subsequent flow of information about the innovation from person to person over time (Zhang et al., 2015).

According to Diffusion of Innovations theory, there are four fundamental elements that influence the diffusion of an innovation: innovation characteristics, communication channels, time, and the social system (Rogers, 2003). The innovation characteristics provide insights into the varying rates of adoption by examining factors such as:

Table 8 – Innovation characteristics as described by Rogers (2003)

Innovation Characteristics	Explanation
Relative advantage	The degree in which the innovation is perceived as better than the idea it supersedes.
Compatibility	The degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of potential adopters.
Complexity	The degree to which an innovation is perceived as difficult to understand and use.
Trialability	The degree to which an innovation may be experimented with on a limited basis.
Observability	The degree to which the results of an innovation are visible to others.

Communication channels play a crucial role in this process, with mass media channels being efficient in disseminating information about the innovation, while interpersonal channels can be more persuasive in influencing individuals' acceptance of the innovation. Time is also a significant factor, encompassing the duration between an individual's initial knowledge of the innovation and their decision to adopt or reject it, as well as the relative timing and rate of adoption within the social system. Innovativeness, which reflects the rate of adoption, categorises individuals into five adopter categories: innovators, early adopters,

early majority, late majority, and laggards. Lastly, social systems, such as families, hospital doctors, or populations in a country, consist of interrelated units working together to address common goals (Rogers, 2003).

In the context of health service delivery and organisation, Greenhalgh et al., (2004) conducted a systematic review to explore the application of Diffusion of Innovations theory. They emphasised the importance of understanding innovation diffusion within service organisations, as it significantly impacts service quality and efficiency. Their work identified additional characteristics that influence the diffusion of innovations in service organisations, including organisation size and structure, external conditions such as political directives and funding, leadership, culture, implementation process feedback, and communication. Based on their findings, a comprehensive model of Diffusion in Service Delivery was developed, which highlights various determinants of diffusion, dissemination, and implementation of innovations in health service delivery (Greenhalgh et al., 2004). The authors underlined the significance of considering the unique characteristics of service organisations when examining innovation diffusion and provided a conceptual model to guide this process.

In summary, the Diffusion of Innovations theory offers valuable insights into the adoption of innovations within social systems. However, it has limitations, such as its focus on a small group of innovators and its inability to address the work-related challenges associated with intervention implementation (Wani and Ali, 2015). In contrast, the NPT focuses on action and the practical aspects of work, making it more appropriate for examining the implementation of deprescribing interventions where the work conducted is a known barrier to implementation (May et al., 2009, Elbeddini et al., 2021).

3.2.2.3. The Behaviour Change Wheel

The Behaviour Change Wheel (BCW), initially introduced by Susan Michie in 2011, provides a robust framework for understanding human behaviour and designing effective interventions to facilitate behaviour change. The development of the BCW involved a systematic evaluation of existing frameworks for behaviour change interventions, assessing their comprehensiveness, coherence, and alignment with a

comprehensive model of behaviour change. Subsequently, a new framework was formulated to meet these criteria and address the identified gaps (Michie et al., 2011).

As a result of this process, the BCW introduced the COM-B system, which explains the dynamic interplay between capability, motivation, and opportunity in shaping human behaviour. The core components of the COM-B system, along with their respective definitions, are presented in Table 9.

Table 9 - Core components of the COM-B system as described by Michie et al. (2011)

COM-B Component	Definition
Capability	An individual's psychological and physical capacity to engage in an activity. Can be physical or psychological.
Motivation	The brain processes that energise and direct behaviour. Can be automatic or reflective.
Opportunity	Factors external to the individual that make the behaviour possible or prompt it. Can be social or physical.

Behaviour change intervention functions were integrated into the core components of the COM-B system, taking into account the characteristics of the interventions. These functions aim to address deficiencies in one or more components of the COM-B system and encompass activities such as restriction, education, persuasion, incentivisation, coercion, training, enablement, modelling, and environmental restructuring. Additionally, policies, defined as actions undertaken by responsible authorities to enable or support interventions, were incorporated into the framework. These policy categories include guidelines, environmental and social planning, communication and marketing, legislation, service provision, regulation, and fiscal measures. Collectively, these components constitute the BCW (Michie et al., 2011).

Subsequent updates to the BCW have incorporated the Theoretical Domains Framework (TDF), which provides a comprehensive assessment of barriers and facilitators to behaviour change and strategies for leveraging them (Ojo et al., 2019, Atkins et al., 2017). The TDF comprises theories and theoretical constructs of behaviour change condensed into 14 domains and 84 component constructs (Cane et al., 2012, Atkins et al., 2017)

The BCW has emerged as a valuable guide for understanding behaviour change and designing interventions to promote desired outcomes. Its application has gained recognition in healthcare research as a means to develop interventions that foster positive behaviour change (Clarke et al., 2019). However, despite the BCW's emphasis on behaviour change and its relevance to implementation research, NPT's focus on normalising interventions into routine practice aligned with the objectives of this project, which aimed to implement deprescribing as a routine practice. Consequently, NPT was deemed the most appropriate approach.

In summary, numerous implementation theories, models, and frameworks exist, some of which are highly endorsed in healthcare research. While various options could have been chosen to guide this research, the suitability of NPT was determined by its focus on implementing and normalising interventions in practice, as well as its provision of constructs that can be leveraged to enhance normalising potential. Moreover, the flexibility of the NPT framework resonated with the pragmatic nature of this study, aligning with its methodological approach.

3.3. Patient and Public Involvement and Engagement

Within the discipline of applied healthcare research, Patient and public involvement and engagement (PPIE) in research helps to ensure facets of healthcare that patients consider important remain at the core of research, with patients having a central role in how research is conducted. It focuses on research ‘with’ or ‘by’ patients and members of the public rather than ‘to’, ‘about’ or ‘for’ them. This can further align research goals and plans with that of those who would be affected by the research outputs, reducing the risk of the research becoming avoidable waste (Ioannidis, 2016). PPIE activity is recommended to improve the relevance and quality of research from the earliest research stages through to dissemination of the findings (Hoddinott et al., 2018). How patients are involved in research is flexible and depends on the topic being investigated, the research questions, the methods employed, and the resources available. This may take the form of patients contributing to decisions on research direction, advising on how to recruit a specific demographic of patients, how to disseminate findings to reach the necessary audience, or sometimes conducting aspects of the research themselves (Hoddinott et al., 2018).

It is important to distinguish PPIE from research involving patients as participants, such as co-design. PPIE involves a continuing and reciprocal relationship between researchers and patients, leading to decisions in research whilst in qualitative

research, for example, researchers aim to improve their understanding of a topic through collecting data using interviews and focus groups (Hoddinott et al., 2018). PPIE may also empower patients to contribute to society, gain new skills and provide a mechanism to share their personal experiences whilst influencing change (Tomlinson et al., 2019). With such benefits not only to the researching landscape but also to personal patient development, including PPIE to this project was desired.

The research was supported by PPIE members affiliated with the National Institute for Health and Care Research (NIHR) Yorkshire and Humber Patient Safety and Translational Research Centre (YHPSTRC). The YHPSTRC, a collaboration involving the University of Leeds, University of Bradford, and Bradford Teaching Hospitals NHS Foundation Trust, focuses on generating applied healthcare research that can be effectively translated into current healthcare practices. The doctoral research received funding from this centre, facilitating access to PPIE research support. The PPIE members involved in this research possessed extensive experience in supporting various healthcare research endeavours.

PPIE played a significant role throughout the research project. Each chapter of this thesis acknowledges the consideration of PPIE advice and whether it resulted in modifications to the research design. Additionally, PPIE was consulted early in the research design phase to gather insights on aspects related to deprescribing implementation that patients deemed significant. This exercise proved valuable in identifying potential patient concerns regarding deprescribing and the significance patients placed on deprescribing education and support provision. It became evident that patients may perceive deprescribing as a cost-cutting measure, accentuating the necessity of providing education on deprescribing. Furthermore, PPIE highlighted the potential sense of abandonment some patients might experience if a medicine was discontinued without adequate post-deprescribing support. Consequently, this feedback informed the identification and review of deprescribing patient education and support literature conducted in Chapter 2. The discussions with PPIE members also shed light on the potential impact of perceptions about the traditional role of pharmacists on the pharmacist-patient relationship and how this could influence the role of pharmacists in deprescribing. Moreover, the researcher found it reassuring that the PPIE members emphasised the importance and relevance of this research, as well as the potential benefits to patient safety it could yield. These interactions with PPIE formed the foundation of their involvement in the project and served as a basis for ongoing development throughout the research process.

3.4. Validity, reliability, and transferability of research

To ensure the highest quality research, it is important to consider the concepts of validity, reliability, and transferability in order to produce credible results with potential to be transferred to different environments, whilst minimising bias (Creswell and Clark, 2017). Strategies to uphold these concepts can be found within the methods section of each chapter, but a summary is briefly discussed here.

Throughout the course of this doctoral research, continuous dissemination of findings took place among the research supervision team, as well as among academics and healthcare professionals through research conferences and academic presentations. This practice served as a form of peer debriefing, allowing for feedback on methods and findings to enhance research conclusions and strengthen credibility and dependability of the research (Anney, 2014).

In the qualitative studies, research findings were disseminated to research participants, and were also shared with the PPIE representatives and HCPs during research presentations and discussions. This approach served as a member check, minimising potential research biases and ensuring that participants were content with the interpretations made (Anney, 2014)

It is important to note that purposive sampling was employed in the qualitative studies, which enhances the transferability of results, i.e., the degree to which research findings can be applied to other contexts (Anney, 2014). However, it should be acknowledged that this research focused specifically on the context of UK primary care and did not aim for transferability beyond this specific context.

Reflexivity and the use of a research journal were employed to facilitate reflection on the research process, including making field notes during data collection and recording new ideas and interpretations, as well as reconciling learning from relevant literature. These practices contributed to the confirmability of the research conducted (Anney, 2014).

Study-specific methods to enhance research quality are described in the relevant chapters; however, as a summary, in the systematic review, the research supervision team conducted blind screenings of random samples of abstracts, titles, and full-text articles to improve the rigor of the screening process. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed to ensure transparency in reporting the systematic review. In the qualitative studies, independent coding of interview transcripts was conducted by a member of the research supervision

team, and discussions were held with the researcher and wider supervisory team to enhance understanding of the coding process. Additionally, the findings of the qualitative studies were shared with research participants, as previously described.

While strategies aimed at minimising bias and upholding research rigour have been discussed, it remains of significance to acknowledge the persisting debates surrounding these concepts and terminologies within the domain of qualitative research. The notion of bias, traditionally rooted in the realm of quantitative research, has led to a general consensus among qualitative researchers that constructs such as rigour and trustworthiness find greater resonance within the subjectively oriented landscape of qualitative research (Galdas, 2017).

Nevertheless, dissenting viewpoints have emerged, debating that the maintenance of rigour in qualitative research presents a distinctive challenge, owing to the dearth of methodologies akin to those employed in quantitative research to counteract bias (Thirsk and Clark, 2017). Consequently, this perspective has prompted other researchers to place heightened significance to the transparency and reflexivity exhibited by qualitative researchers throughout the research processes (Galdas, 2017).

Conversely, an opposing standpoint theorises that the advocacy for research reliability and validity should be embedded intrinsically within the research progression itself, rather than relegated to a post-research evaluation, thereby constituting as an appropriate strategy to ensure research rigour (Morse et al., 2002). The ongoing discourse surrounding the facets of bias and rigour within qualitative research continues to this day. Within the realm of this research, the doctoral researcher has embraced the concept of augmenting the reliability and validity of research as a strategy to bolster research rigour.

Chapter 4 – Study 1: Barriers and facilitators of implementing proactive deprescribing in primary care: a systematic review

4.1. Introduction

This chapter constitutes the opening study conducted following the formulation of the research plan. Building upon the insights derived from the preceding scoping review discussed in Chapter 2, this chapter presents a systematic review that specifically examines the implementation of proactive deprescribing within the primary care setting.

Much of the current evidence for deprescribing in primary care focuses on the process of stopping a medicine. Little work has been done on how deprescribing should be routinely and safely implemented within current primary care systems. This is important as poor implementation planning has led to previous complex interventions failing to be established in primary care and could lead to the benefits of deprescribing not being realised (Lau et al., 2016). Therefore, to maximise patient gain from deprescribing, its optimal implementation within primary care needs to be addressed.

As described in Chapter 3, Normalisation Process Theory (NPT) is a theoretical framework focused on implementation that is used to explain why an intervention succeeds or cannot become normalised within practice. NPT comprises of four constructs: coherence – sense making of the intervention; cognitive participation – commitment and engagement to the intervention; collective action – the work needed to enable the intervention to happen; and reflexive monitoring – how participants reflect and appraise an intervention (Murray et al., 2010). Each construct is further divided into four sub-constructs providing rich description of factors associated with intervention implementation. NPT has been applied to analyse complex interventions in primary care, including through systematic review (Mair et al., 2012).

This review will address the initial stages of implementation planning, through identifying barriers and facilitators of safely implementing routine proactive deprescribing within primary care. This will be achieved through a systematic search of deprescribing literature, and application of NPT to the extracted barriers and facilitators to implementation to provide theoretical understanding on how they impede or enable deprescribing in primary care.

The aim for this systematic review was to identify the barriers and facilitators to routinely implementing proactive deprescribing within primary care.

The objectives were to:

- systematically review the literature to identify barriers and facilitators to implementing routine safe proactive deprescribing in primary care.
- determine the effect the identified barriers and facilitators enact on normalisation potential using NPT.

4.2. Methods

4.2.1. Research question

This systematic review was designed to answer the question “What are the barriers and facilitators to routinely implementing proactive deprescribing within primary care?”. Deprescribing was defined as:

> ‘ [A] *systematic process of identifying and discontinuing drugs where harms outweigh benefits within the context of an individual patient’s care goals, and their current level of functioning’* (Scott et al., 2015, p. 827).

Barriers and facilitators to implement deprescribing in primary care were defined as factors that either impede (barriers) or promote (facilitators) the routine incorporation of deprescribing or deprescribing interventions into daily primary care practice.

Components of the research question were broken down using the SPIDER mnemonic, which was constructed to help researchers compose mixed methods review questions (Methley et al., 2014). As this review considered quantitative, qualitative, mixed and mult- methods data, the SPIDER mnemonic was appropriate. This systematic review focused on deprescribing implementation, and it was thought that the appropriate literature identified, as well as the barriers and facilitators extracted may be qualitative or quantitative in nature. Such factors could be descriptive elements identified during deprescribing intervention implementation, such as factors that impeded intervention delivery, or numerical results identified within studies themselves. As a result, a multi-methods approach was chosen for this systematic review.

Table 10 – SPIDER components of review question

Sample	People in primary care
Phenomenon of **I**nterest	Deprescribing
Design	Empirical study designs
Evaluation	Barriers and facilitators
Research type	Qualitative, Quantitative, Mixed methods, Multi-methods

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 (PRISMA) was used to report this systematic review. PRISMA is an evidenced-based

minimum set of items for reporting in systematic reviews designed to ensure reviews are transparently reported in relations to why the review was conducted, how the review was conducted and what the results are (Page et al., 2021). This provided structure and guidance when conducting the review and reporting the results. The systematic review was registered on PROSPERO (CRD42021164658).

4.2.2. Search strategy

Phase one – initial search

An initial search was performed in MEDLINE and EMBASE using keywords developed from the scoping review presented in Chapter 2 along with knowledge of the field (Okeowo et al., 2022). Additional relevant keywords were then identified. A search strategy was constructed using these keywords, MESH terms and truncations, with expert input from a librarian at the University of Leeds. The full search strategy is presented in Appendix E.

Phase two – database search

A database search was conducted using search strategies developed for each database. The search was performed in MEDLINE, Embase, PubMed, CINAHL, PsychInfo, The Cochrane Library, Web of science and International Pharmaceutical Abstracts. The search was conducted in September 2020 with a date range of 1 January 1996–2020. The lower time range of 1996 was chosen to include articles that may discuss the withdrawal of problematic medicines without the direct terminology ‘deprescribing’ or ‘deprescribe’ being used which was originally described by Woodward et al., (Woodward, 2003). Articles dated prior to 1996 were not searched for because they were deemed unlikely to be relevant based on the doctoral researcher’s previous experience conducting the scoping review presented in Chapter 2 (Okeowo et al., 2022). In addition, earliest polypharmacy research dates back from 1998 but has progressively grown within the past 10 years, so it was expected that a greater number of relevant studies would be identified dated after the year 2000 (Masnoon et al., 2017, Bjerrum, 1998). The search was extended until May 2022 to identify any new and relevant literature. An example of the Medline search strategy can be seen in Table 11.

Phase three – reference searching

The reference lists of key studies included were assessed to identify relevant literature that was not identified through the database search.

Table 11 – Medline systematic review search strategy

Medline	
#1	deprescriptions/
#2	Inappropriate Prescribing/pc [Prevention & Control]
#3	"Medic* withdrawal".tw.
#4	"Medic* Cessation".tw.
#5	inappropriate* Prescri*.tw.
#6	Deprescrib*.tw.
#7	Inappropriate* medication*.tw
#8	“Treatment withdrawal”.tw.
#9	“Stopping medic*”.tw.
#10	discontin* adj3 (medication* or prescription* or drug*)
#11	Medic* adj2 (Cessation or stop* or withdraw*)
#12	Cessation of medic*.tw
#13	Stopping of medic*.tw
#14	General Practice/
#15	Community Medic*.tw.
#16	Community Health Services/
#17	Primary Care.tw
#18	General Practice.tw.
#19	GP*.tw
#20	General Practitioner*.tw.

#21	Primary Health Care/
#22	Community Dwelling .tw.
#23	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
#24	14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22
#25	23 and 24
	Hits = 1214

4.2.3. Eligibility screening, inclusion criteria & exclusion criteria

A two-stage screening process was used to identify studies meeting the inclusion criteria. The inclusion and exclusion criteria are presented in Table 12. Stage one was conducted by one reviewer (DO) who screened the literature identified by title and abstract. To ensure the quality of this screening, two random 20% samples of the search results were independently screened by two additional reviewers (DPA and STRZ). Both reviewers were blinded to each other's and the original reviewer's (DO) screening decisions. Any disagreements between the two reviewers were resolved by a third reviewer (DPA or STRZ).

Stage two involved a full-text screen of the shortlisted studies. This was conducted independently by one reviewer (DO) using the eligibility criteria described in Table 12. To enhance rigour, a random 10% sample of the shortlisted studies was also independently screened by another reviewer (BF) who was blinded to the decisions of the original reviewer (DO). Any disagreements were resolved by a third reviewer (DPA). Both stages of screening were facilitated using EndNote X9 and Microsoft Excel.

Palliative care and long-term care facilities were excluded due to the different treatment goals seen within these specialised care facilities, focused for example, on end-of-life management. Patient self-discontinuation and substance misuse were also excluded as they would not involve deprescribing as described in 4.2.1. This review focused on primary care, hence research involving deprescribing in secondary care and specialised care were excluded. Furthermore, in line with the rest of this thesis, proactive deprescribing was the focus of this review and so deprescribing as a result of an adverse drug reaction was excluded as these are often reactive in nature. Non-English language studies were excluded as it would not be feasible translating non-English language studies with the resources available for this review.

Table 12 – Systematic review inclusion and exclusion criteria

Stage 1 screening – title and abstract	
Inclusion criteria: • Literature discussing implementation of deprescribing or deprescribing interventions in primary care	Exclusion criteria: • Palliative care/life-limiting illness • Patient self-discontinuation • Deprescribing of medicine in reaction to an adverse drug reaction • Substance misuse • Deprescribing within secondary and specialised care • Long-term care facilities • Non-English language studies • Conference abstracts • Grey literature
Stage 2 screening – full-text	
Inclusion criteria: • Literature discussing implementation of deprescribing or deprescribing interventions in primary care	Exclusion criteria: • No Barriers or facilitators to implementing deprescribing found • Non-English language studies • Non-primary Care • Conference Abstracts • Unable to access full text • Narrative reviews • Non-empirical studies • Grey literature

4.2.4. Data collection

Data on the barriers and facilitators of implementing deprescribing or deprescribing interventions in primary care were extracted by DO using a standardised data collection form (Appendix F). The data collected included article name, authors, year of publication, country of publication, methodology (quantitative, qualitative, mixed, or multi-methods), study design, study population, and study focus (qualitative discussion around the concept of deprescribing or use of a specific deprescribing intervention). Once created, the data collection form was trialled on a few studies prior to the review to ensure that the relevant information was captured.

4.2.5. Data analysis

Once each barrier and facilitator was identified, they were tabulated and then mapped on to the constructs and subconstructs of NPT using a coding framework (Table 13) developed and adapted from a previous systematic review that used NPT to aid qualitative data analysis (Mair et al., 2012). The framework provided insight on how each barrier/facilitator affects the normalisation potential of deprescribing in primary care. The coding process was conducted by the doctoral researcher. As numerous barriers and facilitators were extracted from the literature, the data were condensed to summarise the key barriers and facilitators whilst capturing the meaning of each barrier and facilitator. This was achieved through grouping individual barriers and facilitators into major categories, with each category being clearly defined to describe what they encompassed.

Table 13 – NPT Coding framework for systematic review adapted from Mair et al. (2012)

Coherence **(Sense-making work)**	**Cognitive Participation** **(Relationship Work)**	**Collective action (Enacting work)**	**Reflexive Monitoring (Appraisal Work)**
Differentiation Is there a clear understanding of how a	**Enrolment** Do individuals “buy into” the idea of the deprescribing	**Skill set workability** How does the innovation affect	**Reconfiguration** Do individuals try to alter the new service?

deprescribing service/intervention differs from existing practice?	service/intervention ?	roles and responsibilities or training needs?	
Communal specification Do individuals have a shared understanding of the aims, objectives and expected benefits of the deprescribing service/intervention ?	**Activation** Can individuals sustain involvement?	**Contextual Integration** Is there organizational support?	**Communal appraisal** How do groups judge the value of the deprescribing service/intervention ?
Individual specification Do individuals have a clear understanding of their specific tasks and responsibilities in the implementation of a deprescribing service/intervention ?	**Initiation** Are key individuals willing to drive the implementation?	**Interactional workability** Does the deprescribing service/interventio n make people's work easier?	**Individual appraisal** How do individuals appraise the effects on them and their work environment?
Internalisation Do individuals understand the value, benefits and importance of the deprescribing	**Legitimation** Do individuals believe it is right for them to be involved?	**Relational integration** Do individuals have confidence in the new system?	**Systematization** How are benefits or problems identified or measured?

service/intervention ?			

4.2.6. Quality appraisal

The quality of each research article was appraised using the Mixed Methods Appraisal Tool (MMAT) Version 2018 (Hong et al., 2018). The MMAT has been designed to appraise and describe the methodological quality of qualitative, quantitative, and mixed methods research studies when conducting a systematic review. In summary, the tool consists of questions relating to the methodology quality of the research study being investigated. A 'yes', 'no' or 'can't tell' is used to address each question. This allows for a descriptive analysis on the quality of each study. This process was conducted by the doctoral researcher, however examples of MMAT decisions were shared and discussed with the research team.

As the MMAT is only suitable for research studies, it was anticipated that a different quality appraisal tool would be needed for quality improvement (QI) studies. The Quality Improvement Minimum Quality Criteria Set (QI-MQCS) version 1 (Hempel et al., 2015) was chosen as a suitable tool to appraise QI studies. The QI-MQCS is a 16-domain appraisal tool for QI intervention publications, particularly for projects within the discipline of healthcare research. This tool scores each QI study based on whether each domain is 'met' or 'not met', providing a minimal standard needed for a score to be given. It has previously been used in healthcare related systematic reviews (Fang et al., 2021). The MMAT was used for 53 research articles, whilst the QI-MQCS was used for 3 quality improvement articles.

Other quality appraisal tools were considered before the MMAT and QI-MQCS were chosen. The Quality Assessment Tool for Studies with Diverse Designs (QATSDD) was a potentially appropriate tool that could have been used to appraisal the methodological and evidence quality of qualitative, quantitative and mixed methods research studies (Sirriyeh et al., 2012). This was then updated into the Quality assessment for Diverse Studies (QuADS) in 2021. This updated version allowed for greater applicability to health services research when appraising the quality of methods, evidence and reporting in research (Harrison et al., 2021). Due to the heath service nature of this research, the QuADS has its advantages for this review compared to its predecessor, the QATSDD. However, there was a lack of literature

validating and appraising the use of QuADS tool for systematic reviews in comparison to the MMAT tool. As a result, the MMAT was chosen as the preferred tool.

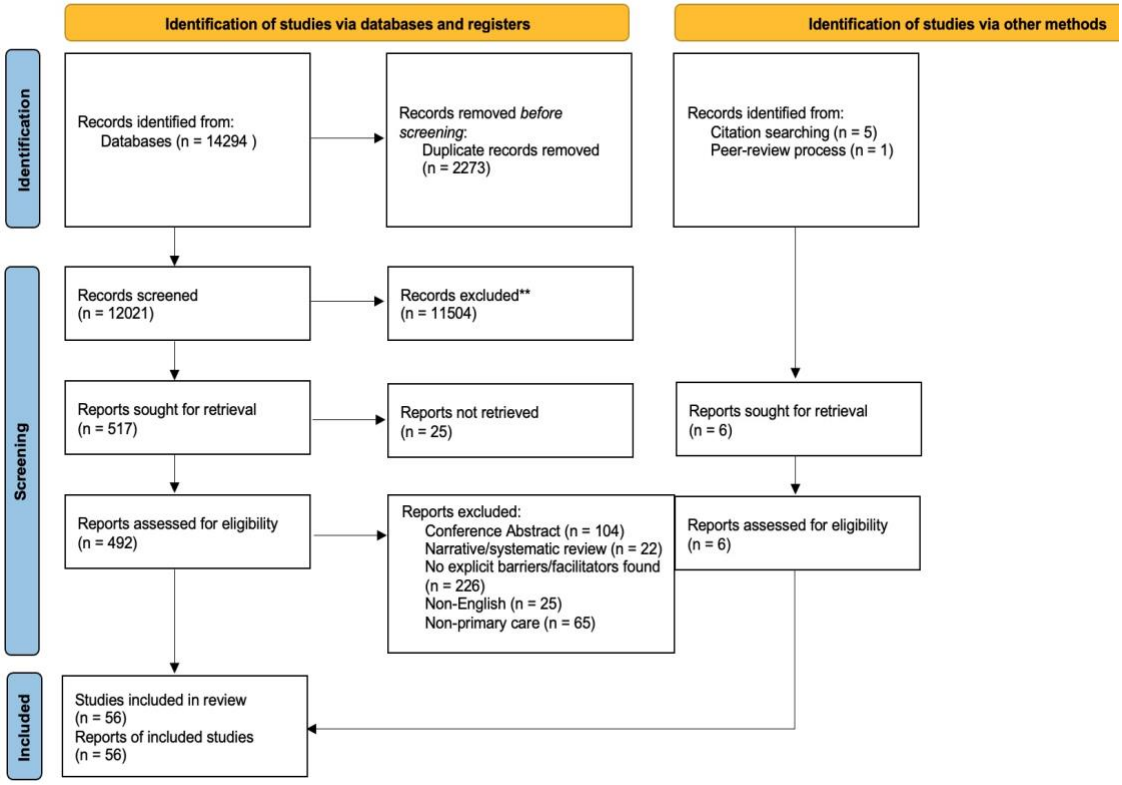
Assessment of risk of bias of studies is needed when synthesising and interpreting quantitative data from RCTs when conducing a systematic review (Sterne et al., 2019). However, this review did not aim to investigate the effectiveness of deprescribing intervention in primary care studies, and so was not concerned with the internal validity of each RCT. In addition, most of the studies included in this review did not investigate the effectiveness of deprescribing. As such, the risk of bias of RCTs included in this review was not assessed.

4.3. Results

4.3.1. Study selection

The search strategy retrieved 12027 citations once duplicates were removed. From 12027 citations, 11504 were excluded based on their title and abstract. A further 492 citations received a full-text screen and were excluded for reasons seen in Figure 4. In conclusion, A total of 56 articles met the inclusion criteria (Anderson et al., 2020, Bosman et al., 2016, Campbell et al., 1999, Carrier et al., 2019, Clark et al., 2020, Cole et al., 2020, Cook et al., 2007, Coronado-Vázquez et al., 2019, Dickinson et al., 2010, Djatche et al., 2018, Duncan et al., 2019, Eveleigh et al., 2018, Farrell et al., 2019, Gillespie et al., 2018, van de Steeg-van Gompel et al., 2009, Heser et al., 2018, Keith et al., 2013, Kennie-Kaulbach et al., 2020, Kuntz et al., 2019, Linsky et al., 2015, Linsky et al., 2017a, Linsky et al., 2019, Lopez-Peig et al., 2012, López-Sepúlveda et al., 2017, Luymes et al., 2016, Luymes et al., 2017, Luymes et al., 2018, Magin et al., 2015, Mantelli et al., 2018, Martin and Tannenbaum, 2017, Martin et al., 2018, Mulder-Wildemors et al., 2020, Murie et al., 2012, Nixon and Kousgaard, 2016, Nixon and Vendelø, 2016, Ocampo et al., 2015, Odenthal et al., 2020, Rieckert et al., 2019b, Rieckert et al., 2020, Rognstad et al., 2013, Schuling et al., 2012, Stuhec et al., 2019, Tannenbaum et al., 2014, Teal et al., 2011, Thompson et al., 2020, Turner et al., 2018, van der Meer et al., 2019, Vandenberg et al., 2018, Vicens et al., 2014, Wallis et al., 2017, Walsh et al., 2016, White et al., 2019, Donald et al., 2021, Jordan et al., 2022, Tangiisuran et al., 2022, Korenvain et al., 2020).

Figure 4 – Systematic review PRISMA Flow Diagram



4.3.2. Study characteristics

Of the 56 articles retrieved, 28 used quantitative methods (Anderson et al., 2020, Campbell et al., 1999, Clark et al., 2020, Cole et al., 2020, Coronado-Vázquez et al., 2019, Djatche et al., 2018, Eveleigh et al., 2018, Gillespie et al., 2018, Keith et al., 2013, Kuntz et al., 2019, Linsky et al., 2017a, Lopez-Peig et al., 2012, López-Sepúlveda et al., 2017, Luymes et al., 2018, Mantelli et al., 2018, Martin et al., 2018, Murie et al., 2012, Ocampo et al., 2015, Odenthal et al., 2020, Rieckert et al., 2019b, Rognstad et al., 2013, Stuhec et al., 2019, Tannenbaum et al., 2014, Teal et al., 2011, van de Steeg-van Gompel et al., 2009, Vicens et al., 2014, White et al., 2019, Rieckert et al., 2020), 21 used qualitative methods (Bosman et al., 2016, Carrier et al., 2019, Cook et al., 2007, Dickinson et al., 2010, Donald et al., 2021, Duncan et al., 2019, Heser et al., 2018, Jordan et al., 2022, Kennie-Kaulbach et al., 2020, Korenvain et al., 2020, Linsky et al., 2019, Linsky et al., 2015, Luymes et al., 2016, Magin et al., 2015, Nixon and Kousgaard, 2016, Nixon and Vendelø, 2016, Schuling et al., 2012, Tangiisuran et al., 2022, Thompson et al., 2020, Turner et al., 2018, Wallis et al., 2017), 3 articles employed mixed methods (Martin and Tannenbaum, 2017, Mulder-Wildemors et al., 2020, Farrell et al., 2019) and 4 articles used multi-methods (Luymes

et al., 2017, van der Meer et al., 2019, Vandenberg et al., 2018, Walsh et al., 2016). Most research articles originated from the Netherlands (n=9), USA and Canada (n=8) followed by Australia (n=6), UK and Spain (n=5), Germany and Denmark (n=3), New Zealand and Italy (n=2), and France, Switzerland, Norway, Malaysia and Slovenia (n=1). The study designs included randomised controlled trials (RCTs) (n=12), quasi-experimental studies (n=12), QI studies (n=3), interview studies (n=18), surveys (n=8) and observational studies (n=3).

4.3.3. Quality appraisal

When using MMAT, the quality of studies ranged significantly, making it challenging to provide an overarching assessment. Although MMAT scores do not directly translate to a description of literature quality such as 'poor' or 'good', a score closer to the upper limit of 5 indicated that the study addressed most, if not all, methodological quality criteria within the MMAT. Most studies identified scored between 3 – 5 (n=36), whilst a minority scored between 0 – 2 (n=17). Broadly, qualitative studies addressed most, if not all, of the MMAT appraisal domains, showing an overall good quality. However, several qualitative studies fell short because of a lack of in-depth description on the rationale for the qualitative approach, the appropriateness of their methods, or how findings were derived from their methods (Luymes et al., 2017, Nixon and Kousgaard, 2016, Nixon and Vendelø, 2016, Schuling et al., 2012, Thompson et al., 2020, Turner et al., 2018).

Mixed and multi-method studies were generally found to have deficiencies in terms of quality. To evaluate the quality of multi-method studies, the quantitative and qualitative components of the research were individually assessed using their respective quantitative or qualitative evaluation criteria within the MMAT, while the assessment specific to mixed methods studies was exclusively applied to those studies utilising mixed methods. Of the three mixed methods studies appraised using MMAT, one study was of good quality and met all the appraisal domains, whilst the other two studies lacked justifying their decision for using mixed methods, clearly showing how quantitative and qualitative results were integrated and having a weak qualitative or quantitative method when this was appraised separately (Martin and Tannenbaum, 2017, Mulder-Wildemors et al., 2020, van der Meer et al., 2019).

The quality of the quantitative research also ranged considerably. Some studies showed good quality and met all the quality domains highlighted by the MMAT. However, in seven of the RCTs, the outcome assessors were not blinded to the

intervention provided. With many of the quantitative non-randomised trials, it was not clear how representative the sample was to the target population or if confounding factors had been accounted for in the study design or analysis. Within the survey studies, it was unclear in many studies if the risk of non-response bias was low.

The three QI studies met most of the quality domains when assessed with the QI-MQCS tool, but none met all quality domains. Farrell et al., scored 9/16, however lacked: defining its study design, describing the timing of and adherence of the intervention, reporting patient health-related outcomes, and describing the reach, sustainability and spread of the intervention (Farrell et al., 2019). Walsh et al., scored 10/16, however lacked: defining its study design, describing comparator care processes, describing adherence, sustainability or potential spread of the intervention and reporting a limitation with its study design/evaluation (Walsh et al., 2016). Vandenberg et al., was the highest scoring study with 13/16 but lacked reporting health-related outcomes and describing the reach and potential spread of the intervention (Vandenberg et al., 2018). Quality appraisal scores for each study can be found in the appendices (Appendix G).

4.3.4. Distribution within NPT

A total of 178 barriers and 178 facilitators were extracted from the included articles. When mapped on to NPT, the number of barriers and facilitators within each construct is shown in Table 14. Each article's identified barriers and facilitators, mapped onto NPT, can be found in Appendix H. Collective action accounted for the most barriers and facilitators, followed by cognitive participation and coherence, respectfully. There were very few barriers or facilitators associated with reflexive monitoring.

Table 14 – Distribution of barriers and facilitators within NPT

Construct of NPT	Number of barriers	Number of facilitators
Coherence	29	26
Cognitive participation	35	37
Collective action	49	62
Reflexive Monitoring	3	1

4.3.5. Extracted barriers and facilitators

Once the barriers and facilitators had been grouped and summarised by their characteristics, 14 barriers and 16 facilitators remained (Table 15).

Table 15 – Barriers and facilitators to implementing proactive deprescribing in primary care

Construct of NPT	Barriers of implementation	Facilitators of implementation
Coherence	• Negative deprescribing perceptions • Patient and HCP strong belief in continuation of medicines • Limited understanding of HCP roles in deprescribing • Uncertainty and lack of information about how to deprescribe • Lack of interest in deprescribing	• Patients receiving deprescribing education • Structured education and training for HCPs on proactive deprescribing • Belief in the consequences of PIMs and ADRs • Deprescribing accepted as scope of practice • Prior agreement on deprescribing clinical decision rules
Cognitive participation	• HCPs apprehensive to discontinue medicines • Patient resistance to deprescribing recommendations • Lack of internal and external collaboration • Lack of proactively identifying patient needs	• Engagement of HCPs and patients • Positive relationships between HCPs and patients • MDT Involvement • Patient-centred approach

Collective action	• Sub-optimal deprescribing environment • Strong prescribing culture • Poor communication and information sharing • Lack of confidence to deprescribe	• Availability of deprescribing resources and support for HCPs • Supportive guidance for patients • Collaborative MDT sharing workload • Presence of pre-defined deprescribing process • Confidence in deprescribing • Requiring medicines to have an associated indication for use
Reflexive Monitoring	• Deprescribing tools not used as initially intended	• Individualised feedback on prescribing for GPs

4.3.5.1. Coherence

Barriers

Coherence, how participants make sense of an intervention, aided in providing a theoretical understanding of how patients and HCPs make sense of deprescribing interventions and how this affects intervention normalisation potential. Where there were negative perceptions concerning deprescribing, intervention implementation was challenging. These were broad but included deprescribing being perceived as an abandonment of care, a money-saving exercise, threatening to current stable conditions with a fear of alienating patients, deviation from standard therapy, and the perceived negative consequences of deprescribing.

In conjunction, scenarios where patients and healthcare professionals (HCPs) strongly believed in the continuation of a medicine, it negatively affected deprescribing implementation. Such reasons included PIMs not seen as problematic because of an absence of side effects, lack of concerns for medicine harms, previous reassurance about the safety of a medicine, a negative outlook to ageing by patients who had an

expectation of “pill for every ill’, psychological attachment to medicines, and the ambiguity associated with the potential effects of deprescribing being a reason to continue medicines.

Similarly, where there was a lack of coherence regarding how to deprescribe or the roles of HCPs during deprescribing, this negatively impacted successful implementation. This encompassed lack of agreement and evidence on deprescribing indications, uncertainty regarding taking an action (deprescribing), lack of risk/benefit information concerning deprescribing preventative medicines, low awareness of tools to improve prescribing, and limited understanding of the role of pharmacists in deprescribing and medicines management.

Facilitators

Facilitators to coherence were related to the provision of education about proactive deprescribing, as well as HCP believing deprescribing within their professional scope. This review found patients receiving deprescribing education and HCPs receiving structured education and training on proactive deprescribing aided the implementation of deprescribing interventions. The nature of patient education typically focused on the patient’s medical condition, risks associated with their medicine (including long-term use and side effects), a lack of evidence for medicine continuation with the oldest of adults, alternative treatment options and lifestyle modifications. Education and training for HCPs involved training on the rationale for proactive deprescribing, clinical guidance on deprescribing, the consequences of PIMs and ADRs and the appropriate indications for medicines. Unsurprisingly, patients and HCPs believing in the negative consequences of continued use of PIMs and the risk of ADRs positively affected the coherence of deprescribing interventions. Lastly, when HCPs accepted deprescribing as within their scope of practice, and prior agreements regarding clinical deprescribing decisions were in place, this aided deprescribing intervention implementation through improving HCPs coherence.

4.3.5.2. Cognitive participation

Barriers

Cognitive participation focused on how patients and HCPs interact with other HCPs and themselves during deprescribing. Patient-focused barriers involved resistance to deprescribing recommendations provided by HCPs, and HCPs not proactively

identifying patient treatment needs and goals. Patients often had low adherence to deprescribing recommendations and were reluctant to stop a medicine prescribed by a different HCP. Scenarios where HCPs were unaware of patients' treatment goals and preferences, and a lack of proactively inviting patients for discussions about deprescribing, contributed to this.

HCP-related barriers associated with cognitive participation were a lack of internal and external collaborations between HCPs and apprehensiveness towards stopping medicines. There was a lack of collaboration between pharmacists and GPs, between different healthcare organisations, and between HCPs with different mind-sets towards deprescribing, impeding implementation. HCPs being apprehensive to deprescribing was a broad barrier which included when a medicine was previously prescribed by a different doctor or specialist, other HCPs undermining attempts to deprescribe initiated by a different HCP, HCPs reluctant to start deprescribing discussions with healthy patients or assuming patients have no issue with polypharmacy or medicine burden, and anticipation that patients will resist deprescribing.

Facilitators

Cognitive participation facilitators broadly involved the engagement of HCPs and patients to deprescribing, positive relationships between both, support and involvement from a wider multi-disciplinary team and taking a patient-centred approach. Engagement of HCPs and patients to deprescribing involved the specific involvement of GPs to engage other HCPs and patients to deprescribing, as well as HCPs encouraging deprescribing to patients. MDT involvement related to the planning of implementation and the actioning of deprescribing interventions, with particular emphasis on pharmacists. Positive relationships between HCPs and patients allowed patients to initiate deprescribing conversations and aided HCPs to effectively action deprescribing.

A patient-centred approach was another broad facilitator identified. This involved actively identifying patient needs, allowing patient involvement in deprescribing discussions, and activating patients to be more involved in their medicines use. In addition, this involved HCPs harnessing patients' motivations to deprescribe and improving their self-efficacy to be involved in deprescribing.

4.3.5.3. Collective action

Barriers

The barriers to deprescribing implementation related to enacting work, collective action, related to factors that impeded the work of deprescribing. This included having a sub-optimal deprescribing environment, presence of a strong prescribing culture, poor communication and information sharing, and a lack of confidence to deprescribe.

Sub-optimal deprescribing environment was a broad barrier that included multiple well-established barriers to deprescribing: lack of clinician time to deprescribe, competing workloads, lack of adequate staffing, lack of a consistent deprescribing workflow, lack of financial support, workspace limitations for deprescribing discussions, working with multiple prescribers, and absence of routine medicines reviews. These well-known barriers continued with the theme of a strong prescribing culture. This encapsulated deprescribing being seen as additional work, so continuation of medicines was perceived as the easier option, clinical guidelines that promoted prescribing but rarely deprescribing, and HCP guilt due to not adhering to clinical guidelines.

Poor communication and information sharing concerned not only how clinical information is documented, but also how it is communicated to different areas of care. This included poor documentation in patient medical notes, lack of access to updated and accurate medical records (particularly for pharmacists), fragmentation of care and the poor flow of information, poor communication between GPs and pharmacists and inadequate overview of patient medicines when registering at a new GP practice. In addition, GPs being unsure that other prescribers respect their deprescribing decisions was evident in this group.

The final barrier was the lack of confidence to deprescribe, including a lack of HCP confidence communicating risks related to deprescribing to patients, and the fear of causing problems through deprescribing. From a patient perspective, this involved patients losing confidence in deprescribing prior to completing stopping medicines.

Facilitators

Facilitators associated with collective action were focused on deprescribing support for HCPs, including deprescribing resources and a collaborative MDT sharing workload, supportive guidance for patients during deprescribing, presence of a pre-defined deprescribing process, confidence in deprescribing and requiring all medicines to have a documented indication.

The availability of deprescribing resources and support for HCPs was the largest group compared to other facilitators and included interventions typically described in many deprescribing studies. This included: financial incentives to deprescribe, electronic medical record (EMR) reminders, tools to help identify and communicate medicine risks to patients, shared decision-making tools, PIMs lists, updated clinical guidelines to include deprescribing and managing co-morbidities, access to deprescribing advice from other HCPs, electronic decision support tools for comprehensive medicines reviews and templates to aid communicating deprescribing recommendations from pharmacists to GPs.

A collaborative MDT sharing deprescribing workload involved effective sharing of information between prescribers, access to accurate patient records, and receiving support with patient follow-ups. Pharmacist involvement in deprescribing contributed to this group through identifying PIMs or patients in need of medicines optimisation, conducting structured medication reviews, providing deprescribing recommendations to GPs, autonomy to switch patients to safer medicine alternatives, providing education to patients and prescribers, and conducting deprescribing audits.

The presence of a pre-defined deprescribing process aided in implementing deprescribing interventions. The beneficial attributes of such a process included being systematic, consistent, and convenient, and adaptable to HCPs' needs. It was important that implementation was not resource-heavy and that there was flexible support offered to patients afterwards. One article also highlighted the importance of at least one face-to-face follow-up appointment within three months of deprescribing (Murie et al., 2012).

Confidence in deprescribing was associated with different stages within the deprescribing process. This encompassed confidence in the deprescribing process, confidence in determining if patients cannot understand deprescribing material, GP confidence in handling adverse effects of deprescribing, lack of fear in deprescribing consequences and confidence in patient knowledge of deprescribing.

The final facilitators were supportive guidance for patients during deprescribing by HCPs or from their social environments and requiring all medicines to have a documented indication.

4.3.5.4. Reflexive monitoring

Reflexive action, how participants appraise deprescribing interventions, contained the fewest barriers or facilitators. There was a paucity of both barriers and facilitators to implementing deprescribing that were associated with appraisal work. The only barrier within this construct was instances where deprescribing tools were not used as initially intended. The only facilitator within this construct was individualised feedback on prescribing provided for GPs post deprescribing.

4.4. Discussion

4.4.1. Key findings

This is the first systematic review to focus on the barriers and facilitators to implementing proactive deprescribing interventions in primary care through the theoretical lens of NPT. A total of 178 barriers and 178 facilitators were identified and condensed into 14 barriers and 16 facilitators. Collective action was the most prevalent construct, whilst there were a lack of barriers and facilitators associated with reflexive monitoring. This review provides novel insight into implementing deprescribing through extraction of barriers and facilitators, with a theoretical connection to how these factors may affect normalisation potential of deprescribing through the constructs of NPT. It also highlights the lack of evidence around the appraisal of deprescribing interventions, and how little deprescribing implementation barriers and facilitators have been discussed. Such evidence has been called for to aid the implementation of safe and routine deprescribing in primary care (Thompson et al., 2019).

When looking at the distribution of barriers and facilitators within NPT, it was unsurprising that collective action was most prevalent. Much of the current evidence on deprescribing is focused on the process of conducting deprescribing and, subsequently, the work needed for deprescribing to happen. Scott et al.'s influential article discussing the process of deprescribing, led to research applying such principles within different healthcare contexts (Scott et al., 2015, Wong et al., 2021, Gazarin et al., 2020, Lee et al., 2019). The resultant effect is developed knowledge about the work, i.e. collective action needed to action deprescribing, for example, through the 5-step protocol proposed by Scott et al., (Scott et al., 2015).

A key finding was the lack of barriers and facilitators associated with reflexive monitoring, highlighting a gap in deprescribing research about how deprescribing should be appraised. Using NPT's reflexive monitoring sub-constructs, this would include understanding how individuals try to alter their practice, how groups and individuals judge the value of deprescribing interventions, and how the benefits or problems with deprescribing interventions are measured. Much of the deprescribing literature included in this review involved limited patient follow-up, ranging from 6 months–2 years, with minimal discussion on how the effects of deprescribing may be reflected on and appraised by patients and HCPs. The appraisal work that was found in a minority of studies comprised of individualised prescribing feedback for GPs. Providing feedback is important to identify a change in prescribing patterns resulting

from deprescribing but does not provide in-depth detail on the effect deprescribing implementation has on practice culture and cross-organisational system work and culture. Previous research has also highlighted this lack of evidence on how the downstream effects of deprescribing are evaluated, with a call to address this research need (Thompson et al., 2019).

Extracting barriers and facilitators to implementation from the literature was challenging. Most included studies did not explicitly discuss factors that aided or impeded intervention delivery, with brief detail provided when discussing study design limitations. More detailed research and reporting on the barriers and facilitators affecting the implementation of deprescribing in primary care is needed. Most intervention studies fail in reporting implementation aspects, leading to inadequate understanding of the effective mechanisms of the intervention or difficulties replicating studies (Bach-Mortensen et al., 2018). Deprescribing implementation evidence would enhance its implementation and diffusion within healthcare systems.

The overall quality of studies varied significantly and there is a need for higher quality research to inform its implementation in primary care (Duncan et al., 2017).

4.4.2. Comparison with existing literature

A previous systematic review by Reeve et al., highlighted patient barriers and enablers to deprescribing (Reeve et al., 2013b). While it focused on patients' perspectives of deprescribing, rather than its implementation, and it was not guided by theory, there are commonalities between both reviews. Disagreement with the appropriateness of deprescribing, issues with the process of deprescribing, negative influences from family/HCPs and the fears associated with deprescribing, such as potential negative consequences, were key patient barriers (Reeve et al., 2013b). These are comparable to the coherence barriers, negative deprescribing perceptions and patient belief in a continuation of medicines, and the collective action barrier sub-optimal deprescribing environment.

Reeve et al., identified agreement with the appropriateness of deprescribing, aspects of process of deprescribing such as follow-up care available, positive influences and a dislike for medicines as patient enablers to deprescribing (Reeve et al., 2013b). Again, these enablers closely matched the coherence facilitator 'belief in the consequences of PIMs and ADRs', cognitive participation facilitators 'positive relationships between HCPs and patients', 'taking a patient-centred approach', collective action facilitators, 'supportive guidance for patients' and 'presence of a pre-defined deprescribing

process'. In summary, Reeve et al., advocated the need for a patient-centred deprescribing process that involved patient education and included support, monitoring, and follow-up (Reeve et al., 2013b). This review reiterates the need for a patient-centred approach to deprescribing but provides a deeper theoretical understanding of why such relationship and engagement work (cognitive participation) is needed to normalise deprescribing in primary care. Focusing on such factors would enhance deprescribing implementation for the future.

Another systematic review investigated the barriers and facilitators of deprescribing in primary care, including residential care homes. This study separated barriers and facilitators by socio-ecological levels: individual, interpersonal, organisational, and cultural. Cultural barriers related to a prevailing culture of prescribing medicines, with little financial incentive to address polypharmacy, similar to the collective action barriers identified in our review (Doherty et al., 2020). Interpersonal barriers were broad but related to fragmentation of care, poor collaboration between prescribers, uncertainties and lack of knowledge and GPs reluctance to stop medicines stopped by a specialist. These barriers were identified in this review. However, they were associated with multiple constructs of NPT, explaining how these barriers may impede implementation through their effect on coherence, cognitive participation, and collective action. Individual barriers related to patients not knowing why they were taking a medicine, lack of knowledge of or concern for medicine harms, and patients and HCPs less inclined to stop a medicine (particularly if taken over many years) (Doherty et al., 2020). These barriers were attributed to how patients and HCP make sense of deprescribing, and therefore coherence, in this review.

Organisational facilitators, identified by Doherty et al., called for improved clinical guidelines addressing multi-morbidity and deprescribing, and guidance to improve skills, tools, and knowledge of HCPs to deprescribing. In this review, this was identified as structured education and training for HCPs on proactive deprescribing within coherence and availability of deprescribing resources and support for HCPs within collective action. Similar to barriers, interpersonal facilitators were broad but involved improved communication between HCPs, positive relationships between HCPs and patients, the importance of continuity of care, provision of education to patients and the involvement of a wider MDT – especially community pharmacists (Doherty et al., 2020). The individual facilitators were 'improved information and guidance on deprescribing for GPs' and the 'ability to seek guidance from experienced colleagues', 'a patient-centred approach to deprescribing' and 'patient trust in their GP' (Doherty et al., 2020). Again, these facilitators emerged within this review and were attributed to affect

normalisation of deprescribing through coherence, cognitive participation, and collective action.

The approach taken in this review allows for further understanding of why these barriers and facilitators influence deprescribing implementation and normalisation, through their effect on the constructs of NPT. This approach, and NPT's implementation focus, has allowed for deep exploration of implementation barriers and facilitators, identify gaps in the deprescribing evidence-base and identify future research directions. However, this review has also highlighted how factors needed to normalise deprescribing in primary care have yet to be fully explored, particularly how deprescribing is appraised by those involved in the process. Facilitators identified in this review should be considered and incorporated within deprescribing implementation proposals to enhance the normalisation potential of interventions. On the other hand, it would be beneficial to plan how to overcome or minimise the effects, of the barriers identified, on the coherence, cognitive participation, collective action, and reflexive monitoring of deprescribing interventions. NPT has been useful in making theoretical connections between components of deprescribing interventions within literature and how they might affect the real-world implementation processes. Such evidence is needed to implement safe and routine deprescribing in primary care.

4.4.3. Implications for research and practice

Proactive deprescribing is an essential part of good prescribing practice and is needed to combat problematic polypharmacy. However, its safe implementation into routine practice is complex, involving understanding how patients and HCPs make sense of, engage with, conduct, and reflect on deprescribing. This review highlights several future research gaps that need to be addressed to ensure effective deprescribing implementation:

- Future research should identify and explore factors that impede or facilitate the routine implementation of deprescribing interventions in primary care. Furthermore, there is a need for improved reporting of implementation factors of deprescribing interventions, to enhance the ability to replicate such interventions within healthcare.
- There is a paucity of deprescribing research into the appraisal of deprescribing interventions in primary care. Future research should investigate how different stakeholders appraise the effects of deprescribing and how deprescribing interventions are adapted once implemented into practice. This would enhance

the deprescribing literature, through highlighting how stakeholders reflect on deprescribing and how this can be augmented to optimise implementation approaches.

- Deprescribing is being implemented in UK primary care through the use of structured medication reviews (SMRs). Post-implementation research of deprescribing, through theoretical lenses, will be important to ensure deprescribing is conducted safely and routinely. Use of theoretical approaches when considering implementation, such as the use of NPT in this review, can provide a clearer understanding to how and why implementation of a healthcare service succeeds and aid future replication (Nilsen, 2015).

4.5. Conclusion

Safe and routine deprescribing is needed to combat problematic polypharmacy, but its implementation into primary care is complex with limited supporting evidence. This review has identified barriers and facilitators to deprescribing implementation and provides novel understanding on how they affect normalisation of proactive deprescribing. It has also recognised the need for greater appraisal of deprescribing and its impact on patients and HCPs. This review supports the need for improved focus and reporting on implementation factors within deprescribing research. Such evidence is needed to replicate safe and routine deprescribing implementation across healthcare settings. Furthermore, this review highlighted significant barriers and facilitators to deprescribing implementation, in conjunction with the lack of knowledge on deprescribing appraisal in literature, to further explore with patients and HCPs in the subsequent qualitative work.

Chapter 5 – Study 2: Patient interviews

5.1. Introduction

This empirical study builds on the findings of the scoping review and systematic review in previous chapters and focuses on patients. This study was designed in combination with the study in Chapter 6 which focuses on HCPs. This chapter looks to understand the education required when the topic of deprescribing is introduced to patients. It also seeks to understand the support patients deem necessary when experiencing deprescribing, and their views on different HCPs that could be involved in the deprescribing process. These views were identified by conducting semi-structured interviews with patients and utilising framework analysis to analyse the data (Gale et al., 2013). In this study, NPT played a pivotal role in shaping the data collection phase: several interview questions were mapped to the theoretical underpinnings of NPT. NPT was also leveraged to provide context to why the empirical findings influence deprescribing implementation in primary care.

5.1.1. Aims, objectives, and research questions

The overarching aim of this study was to explore the perspectives of patients regarding the implementation of safe and routine deprescribing in primary care. This encompassed examining the specific educational and support needs identified by patients and their viewpoints on the involvement of different healthcare professionals (HCPs) in the deprescribing process.

Objectives were to:

- identify optimal methods of introducing and actioning deprescribing from the patient's perspective.
- understand the nature of support patients require during deprescribing.
- identify patient views on the involvement of different healthcare professionals in deprescribing.

Research questions:

- What information should be incorporated in patient education programs on deprescribing?

- What nature of support do patients perceive as essential for safe deprescribing in primary care?
- How do patients perceive the potential roles of HCPs, with a particular focus on pharmacists, in the context of deprescribing in primary care settings?

5.2. Methods

5.2.1. NHS Health Research Authority (HRA) Ethical approval

NHS Ethical approval was required to conduct research with NHS patients and NHS organisations such as general practices. Research study details were populated in the Integrated Research Application System (IRAS) and submitted to the relevant research ethics committee (REC) for proportionate ethical review. Following this review, the REC highlighted ethical issues and considerations to be addressed, and so further referred this study to be reviewed by a full REC. Prior to the full REC review, responses to the ethical considerations identified were drafted and provided to the REC (Appendix I). Although there were numerous considerations highlighted, there were a few key considerations which are discussed here.

One aspect highlighted by the REC concerned patient confidentiality during online focus groups. The REC expressed concerns regarding the potential disclosure of sensitive information by patients about their medical conditions. The participant materials lacked sufficient information to caution participants about the risk of disclosing sensitive information in a group setting, and there was no requirement for participants to sign a non-disclosure agreement (NDA). Consequently, confidentiality could be compromised. In response, participants were explicitly informed about the limited confidentiality within the patient focus groups and instructed not to share any information from the group outside of the group. The participant information sheet (PIS) and consent form were subsequently revised to reflect this clarification. Additionally, any safeguarding discussions with patients would be conducted separately from the focus groups, and participants were encouraged to consult their own HCP for further support. It was not felt that an NDA was appropriate and proportionate which was accepted by the REC.

Another consideration raised by the REC pertained to the handling of personal identifiable data. While the original PIS indicated that such data would not be shared with the transcription company, the REC deemed video data as personally identifiable, thereby breaching confidentiality. To address this concern, only anonymised audio recordings of interviews and focus groups were sent to the transcription company. The PIS and consent form were accordingly amended to reflect this revised approach.

Furthermore, the REC raised questions regarding the feasibility of participants aged 65 years and older accessing the Microsoft (MS) Teams® software for online focus groups and interviews. The REC suggested the need for clarification regarding the

exploration of alternative media platforms, as limiting the choice of platforms could potentially impact participant recruitment and compromise the representativeness of the study population. It was explained that Zoom® had been considered but was deemed inappropriate due to a security breach reported in 2020. MS Teams®, as the authorised meeting software within the university, was selected for its availability, approval for handling highly confidential information (including medical discussions), and its compatibility with mobile phones, telephones, and web browsers. To support participants, a step-by-step guide was developed to assist participants in connecting to interviews and focus groups. Additionally, participants were offered the option of a trial run with the researcher to practice connecting to MS Teams®. Telephone interviews were also considered as a backup option if the use of Microsoft Teams was deemed unsuitable.

Following the full REC review, the study received ethical approval by the East of Scotland Research Ethics Service (EoSRES) (ref no. 21/ES/0020) (Appendix J).

5.2.2. Inclusion and exclusion criteria

The inclusion and exclusion for recruiting patients are shown in Table 16. It was decided that patients aged ≥65 years old taking ≥5 medicines was the appropriate study population due to their increased risk of problematic polypharmacy, as discussed in Chapter 1 (Gao et al., 2017). Community-dwelling patients were recruited and patients within care homes and palliative care were excluded as such speciality of care fell outside the remit of this research.

Table 16 – Patient inclusion and exclusion criteria

Inclusion criteria
UK patients
≥65 years old
Taking ≥5 medicines
Community-dwelling
Capacity to provide consent
Exclusion criteria
Patients living in care homes
Patients whose care is currently managed through palliative care

5.2.3. Recruitment

A purposeful sampling technique was used, as this was appropriate to identify patients who met the inclusion criteria in Table 16 (Bryman, 2016). The target sample size ranged from 27 to 42 total participants, encompassing a distribution of 15 to 24 patients and 12 to 19 HCPs (Chapter 6). This sample size threshold was chosen as it aligned with previous qualitative literature in the field of deprescribing, wherein similar cohort sizes had been successfully employed for participant recruitment (Linsky et al., 2015, Donald et al., 2021, Turner et al., 2018). Due to the COVID-19 pandemic, recruitment methods were adapted to comply with social distancing guidelines. As a result, patient recruitment had to be flexible and diverse in approach to achieve the required number of participants. Recruitment posters and a patient information sheet were developed to promote the study and brief patients on the study's nature (Appendix K & L). A meeting was held with the NHS West Yorkshire Research and Development (R&D) team to identify how to circulate the research opportunity to patients across the region. Research active GP practices across West Yorkshire were contacted by the R&D team, asking to circulate the study with their service user groups. Once a practice responded with an expression of interest, the doctoral researcher contacted the practice to introduce themselves and the nature of the study, what was expected of the practice (to display recruitment posters and share study details with patient participation groups within the practice), and when the study would begin. This opportunity was used to send electronic copies of the recruitment posters and

information sheets via email to the interested practices to circulate. It was advised that potential participants should contact the researcher directly to be registered onto the study. In total, 60 research active GP practices in West Yorkshire were contacted.

In addition, an infographic (Appendix M) inviting patients was shared on Twitter and within patient network groups and charities. This included:

- School of Healthcare Experts by Experience in Education and Research Group at University of Leeds.
- Yorkshire Quality and Safety Research patient panel
- Safety in Numbers group (SING) in the NIHR PSTRC
- Leeds Older People's Forum
- Cross Gates & District Good Neighbours' Scheme
- Care75+ - an experimental research cohort of community-dwelling older people aged 75 years and over involved in a longitudinal study to understand the process of ageing and frailty (Heaven et al., 2019).

When all planned routes of recruitment had been exhausted, the study was also shared on the NIHR People in Research website which highlights opportunities for public involvement in NHS, public health, and social care research.

Once patients expressed interest in participating in the study, they were provided with an information sheet, if they had not already received one from a general practice, and a consent form (Appendix N). A relationship was established with the participants through the researcher contacting them and introducing the nature of the research. Simultaneously, patients were asked for their age, gender, number of medicines they take, and ethnicity to ensure they matched the inclusion criteria and to aid in recruiting a range of genders and ethnicities. On completion of their participation, patients were provided with a £20 Amazon voucher as compensation for their time, in line with the NIHR INVOLVE guidelines (INVOLVE, 2020). Recruitment continued until the research team decided a sufficient sample size was reached based on available resources, reaching the lower range of the target sample size, remaining timelines, and repetition of emerging themes during ongoing data analysis.

5.2.4. Interview guide

An indicative interview guide was developed based on the findings of the scoping and systematic review conducted by the researcher (Appendix O). It was then further refined through discussions with the research supervision team and PPIE

representatives to enhance appropriateness for patients. Furthermore, the interview guide was piloted with fellow doctoral researchers to ensure interview questions made sense.

In the interview guide, a hypothetical deprescribing scenario was presented to patients, with subsequent questions based on patient education, patient support, and the potential role of pharmacists in deprescribing in primary care. A hypothetical scenario was utilised so that patients could imagine a deprescribing scenario, instead of discussing the possibility of stopping their own medicines, which could have posed ethical issues. In conjunction, two questions were influenced by NPT concerning cognitive participation (legitimation) and collective action (relational integration). These questions were around patient involvement and confidence in deprescribing and were included to understand factors needed to normalise deprescribing in primary care. These interview questions were selected based on the researcher's careful consideration of their appropriateness and relevance to the role of patients in deprescribing. The decisions regarding these specific questions were informed by prior research findings from Chapter 2 and 4, and meaningful discussions with the PPIE representatives. By focusing on these aspects, it was anticipated that any identified deficiencies could be effectively addressed and leveraged to enhance the process of normalising deprescribing in primary care.

5.2.5. Data collection

Informed participant consent was collected via the electronic consent form provided with the information sheet, or verbal consent was recorded before the interview or focus group as an alternative. Participants demographics were recorded whilst checking each participant matched the inclusion criteria.

Patients were invited to focus groups or semi-structured interviews, depending on their preference and availability. Focus groups were up to 90 minutes long and conducted online via MS Teams®, whilst semi-structured interviews were up to 60 minutes and conducted online via MS Teams® or telephone. Patients were able to choose if they wanted a telephone or online interview. Online interviews and focus groups were digitally recoded using the meeting record function in MS Teams® or using a digital tape recorder for telephone interviews. Interviews were conducted by the doctoral researcher, however a PPIE representative or research supervisor was available to assist in facilitating focus groups. Audio files were transcribed by an approved external transcription company, 1st Class Secretarial.

To prepare participants for interviews, each participant was provided with a step-by-step guide on how to join a MS Teams® meeting and provided the MS Teams® meeting invite well in advance and just prior to the interview if needed. Participants were also offered an opportunity to practice joining a MS Teams® with the researcher if they desired. Participants were also allowed to have a non-participant with them to provide technology support, however they would need to agree with the confidentially rules as described in the information sheet. The researcher also made field notes during the interviews and focus groups to note any relevant observations and allow personal reflections on the process.

The study findings of Chapter 5 and Chapter 6 were comprehensively reported in adherence to the Consolidated Criteria for Reporting Qualitative Research (COREQ), a widely recognised reporting guideline tailored for qualitative research (Appendix Q) (Tong et al., 2007).

5.2.6. Data analysis

Interviews and focus group data were analysed using the framework analysis method (Gale et al., 2013), following a systematic and rigorous approach. The researcher began by immersing themselves in the data, carefully reviewing and listening to the initial interview recordings and reading transcripts. This enabled a comprehensive understanding of the data, including the participants' responses. Reflective field notes, documenting the researcher's observations during data collection, were also reviewed to provide additional insights during the analysis phase. Open coding was then conducted, with the researcher assigning relevant codes to the identified data segments. This process was facilitated using NVIVO®. To enhance the validity of the coding process, the research supervisors were also involved in independently coding the same transcripts. Subsequently, the researcher engaged in discussions with the supervisors, exploring the rationale behind their assigned codes. Through collaboration, the codes were further refined and organised into groups based on their characteristics and similarities. This iterative process resulted in the development of an analytical framework comprising distinct code categories. An example of the analytical framework can be found in the appendices (Appendix P). The established analytical framework was then applied to the remaining transcripts. During this iterative process, if new information emerged that did not align with the existing framework, appropriate adaptations were made. Throughout the application of the analytical framework, the researcher identified emerging themes within the data, noting their significance and

relevance to the research question. Subsequently, the data were charted into a framework matrix using NVIVO®, enabling a summary of data categories for each transcript. The interpretation of the data involved the researcher critically reviewing the compiled codes and categories in relation to the research question. This process was further refined through in-depth discussions with the supervision team, exploring the relationships between the categories of codes and the data encapsulated within them.

NPT was used in this process to guide interpretation during the framework process, particularly of the NPT derived questions, and to contextualise findings. By following this rigorous analytical process, a comprehensive understanding of the data was achieved, supporting the exploration of key themes and sub-themes relating to the research question.

5.2.7. PPIE involvement

Patient and Public Involvement and Engagement (PPIE) played a crucial role in the planning and execution of this study. The insights and recommendations provided by PPIE representatives significantly influenced various aspects of the research process.

During the development of the interview guides, PPIE advice was sought to enhance the interview experience. It was suggested to incorporate house rules at the beginning of the interviews to create a friendly and conducive discussion environment. This recommendation, endorsed by the supervision team, was integrated into the interview guides. Furthermore, PPIE representatives emphasised that some patients might not have recent experiences of stopping medicines. To facilitate discussions, it was recommended to use scenarios rather than discussing personal medicines. This approach not only encouraged reflection but also minimised the potential risk of patients stopping their own medicines.

PPIE representatives also provided valuable input regarding the terminology used in the interview guides, recognising that some individuals refer to pharmacists as "chemists". The researcher took note of this feedback and adjusted the interview guide to ensure clarity when discussing community pharmacy.

Feedback from PPIE representatives was sought on recruitment posters, information sheets, and consent forms. Their expertise ensured that the language and visual presentation were appropriate and accessible to patients. The materials were shared with the Yorkshire Quality and Safety Research patient panel, who expressed

satisfaction with the clarity of the information provided. Additionally, the reimbursement amount for patient participation was deemed sufficient.

PPIE discussions also addressed the recruitment strategies during the COVID-19 pandemic. Optimal approaches to reach eligible participants were explored, and PPIE identified patient groups, such as the Safety in Numbers group, to disseminate the study information on behalf of the researcher.

PPIE members were consulted in relation to the logistics of conducting online interviews with older patients. Considerations were made to accommodate patients who might not feel confident using online communication platforms. As a result, telephone interviews were established as an alternative option, and patients were offered the opportunity to participate in a trial run to familiarise themselves with joining a MS Teams® meeting.

The involvement of PPIE ensured that the research process was responsive to the needs and perspectives of patients, enhancing the overall quality and relevance of the study.

5.3. Results

5.3.1. Participant characteristics

A total of 20 patients were recruited with 10 online and telephone interviews each conducted. No repeat interviews were conducted. The patient demographics of the study sample can be seen in Table 17. Overall, the majority of the study population consisted of female participants, and the most common ethnicity was white British. Only one participant (patient 20) attended the interview with a non-participant, who was the patient's daughter. Interview duration ranged from 23 minutes to 71 minutes with and average time of 46.75 minutes. Although transcripts were not returned to participants for corrections, findings were disseminated to participants to provide opportunity for feedback. However, no substantial feedback was received that warranted a change in findings.

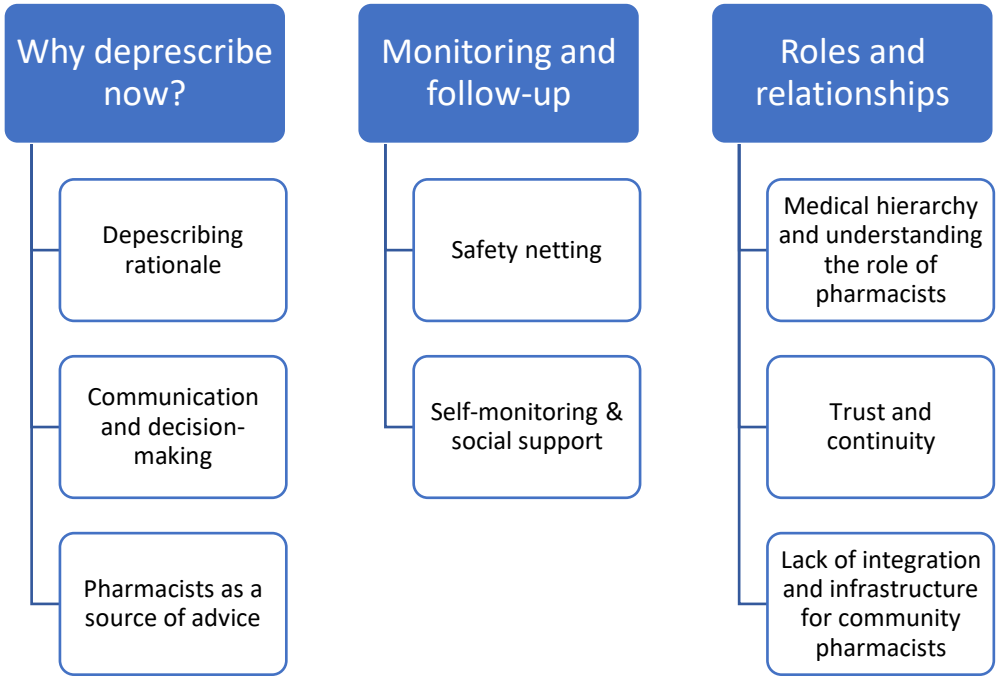
Table 17 – Study 2 Patient demographics

Patient	Age	Gender	Ethnicity	Number of Medicines taking
1	88	M	White British	8
2	66	M	White British	6
3	76	F	British Indian	8
4	70	F	White British	10
5	73	F	White British	10
6	86	F	White British	5
7	83	F	White British	5
8	67	F	White British	10
9	79	F	White British	8
10	87	F	White British	13
11	66	F	White British	6
12	74	M	White British	5
13	77	F	White (other)	5

14	66	M	White (other)	6
15	76	M	White British	9
16	68	F	British Pakistani	12
17	74	F	White British	12
18	72	F	White British	8
19	72	F	British Chinese	5
20	70	F	White British	8

5.3.2. Findings from Framework Analysis

Figure 5 – Thematic map derived from Framework analysis of patient interviews



Following framework analysis, three themes were developed from the data, with eight associated subthemes. These main themes were: 'Why deprescribe now?', 'Monitoring and follow-up', and 'Roles and relationships'.

5.3.2.1. Why deprescribe now?

This theme presents the information patients would like when the idea of deprescribing is introduced. It is presented in the following subthemes: 'deprescribing rationale' highlighting the importance patients place on understanding why deprescribing is being

proposed, ‘communication and decision making’ describing how patients would want deprescribing consultations to work and how involved in these decisions they want to be, and ‘pharmacists as a source of advice’ describing the additional sources of information patients may consult when deciding if deprescribing is right for them.

5.3.2.1.1. Deprescribing Rationale

The first piece of information patients wanted to know, when the idea of proactive deprescribing was proposed to them in a hypothetical scenario, was the rationale behind the recommendation. Patients explained that they would be curious about what may have changed in their health to trigger HCPs to consider stopping a medicine. This was especially the case if the patient had been taking the medicine for a long period of time and felt the medicine was still beneficial. This led to patients then wanting to know what harm would occur if they were to continue the medicine instead.

> *“I’d want to know all the reasons why it was being stopped in the first place, what had caused it to be stopped. If I felt it was doing me benefit, then I would want to know why it were being stopped. If it’s presumably because it was going to start doing me harm, and what that harm was.” [Patient 1, male, 88]*

> *“I would always ask the question why, why now, why this, what do you expect would happen?” [Patient 9, female, 79]*

Patients also highlighted why understanding the rationale for deprescribing is critical to accepting deprescribing. They had previously been told their medicines were ‘for life’ so the idea of medicines being stopped seemed to go against this and so patients were sceptical of the idea of deprescribing. One patient, who had experienced having a medicine deprescribed previously, explained how the idea of deprescribing came as a shock.

> *[In response to previous deprescribing experience] “Which I was quite surprised at, because when I was given them, I was told that you'll be on these for life. And just to say stop taking them it came as a bit of a shock.” [Patient 2, male, 66]*

Patients expressed how the deprescribing rationale would need to be provided in relation to their current health and condition. This meant that the rationale was supported through objective assessments of their condition and through relevant investigations such as blood tests. It was explained that this would be a logical way to justify deprescribing to patients. One way that this was proposed was that the

deprescribing recommendation was split into two consultations, first to introduce the idea and take the necessary clinical observations needed to review their condition (relating to the medicine to be deprescribed), and the second consultation to discuss the results of the observations in light of deprescribing, and then to initiate deprescribing.

> *"Well, I'd like [a] review of my condition. And whether that's further tests, x-rays, scans, whatever, I don't know, blood tests and so forth. And then a second consultation basically saying, your blood whatever levels are now okay, you don't particularly need this particular drug anymore. Give some logical reason why it's going to be stopped." [Patient 15, male, 76]*

Furthermore, it was essential for patients to understand whether the decision to stop a medicine was financially motivated. Numerous patients disclosed that they would hold a suspicion that deprescribing was predominantly due to the NHS wanting to save money, as opposed to putative clinical benefit. It was described that this was due to their own experiences with medicine changes as a result of cost savings, such as medicine brand switches. One patient further highlighted a lack of trust in GPs due to a perception of their financial motivations, and so described how they would approach deprescribing negatively as a result.

> *"I would suspect them of going for a cheaper medicine because basically GPs [are only] interested in financial returns. I don't trust GPs at all … Why he's doing it because I would want to make sure that it's not just a question of using a cheaper medicine." [Patient 12, male, 74]*

> *"I'm assuming that simply stopping, and this is being a bit cynical, is for my benefit and not the budget's benefit." [Patient 17, female, 74]*

After discussing the rationale for deprescribing, patients noted that they would want to know about the plan of how the medicine would be stopped i.e., whether this would be a gradual dose reduction or an abrupt stop, whether another medicine would need to be introduced as an alternative, and the potential side effects or benefits they might experience as a result of stopping the medicine. This helped patients to understand the deprescribing process and what they might experience as a result. Patients clarified that this provided further information that would help to decide on whether they would want to have a medicine stopped or not.

> *"Probably timelines. Was it going to be something that it would just stop, bang? Is it something that's a gradual phasing out? Is it necessary for washout if he wanted to put me on a different tablet?" [Patient 14, male, 66]*

"[Are there] any potential side effects we're looking for in terms of general health? … …anything that really is debilitating? … Adverse effect on your life? … Are you going to feel the other side effects that are beneficial? Are you going to feel more active?" [Patient 11, female, 66]

A few patients highlighted they were interested in the evidence behind the deprescribing rationale. For them, they would be more convinced to be involved in deprescribing if provided scientific evidence behind the benefit, so that they could understand why it might benefit them specifically. These patients expressed that they were driven by evidence, hence placed more emphasis on deprescribing evidence as part of the rationale. In addition, the support for deprescribing by professional healthcare organisations such as the National Institute for Health and Care Excellence (NICE) would further help justify the deprescribing rationale.

"I think, if the doctor told me that NICE had updated its guidance for that particular medication, and it was supported by the Royal College of Physicians and the Royal College of GPs. And presented me with a paper or something that's in the British Medical Journal to that effect, regarding the lack of efficacy for that particular medication, I would be convinced. Because I'm driven by evidence." [Patient 13, female, 77]

"If there is some, I mean, obviously research, I'd want to know the source of that." [Patient 7, female, 83]

When asked what would help people feel confident about deprescribing, patients voiced how being provided with, and sufficiently convinced by, the rationale for deprescribing would address this. Moreover, a key element of a convincing rationale for patients was around knowing that the continued use of the medicine would be detrimental to their health and what the possible risks of deprescribing were. This would be a source of confidence for patients to undergo deprescribing.

"Yeah, the thing that would make me feel most confident, if I was given good convincing advice as to the reason for stopping that medication … In other words, continued use of it would result in consequences that were damaging to my health." [Patient 1, male, 88]

[On being asked on what would provide confidence in deprescribing] "That I knew what the effect would be of it being stopped, why it was being stopped…. Why didn't you stop it before now?" [Patient 8, female, 67]

Supplementary to being convinced by the deprescribing rationale, patients noted that learning about other patients' experiences with deprescribing would help improve their confidence in the process. This could be through word of mouth or reading about other patient's deprescribing experiences. Knowing that other patients had been through a similar situation safely was described as motivating, relatable, and provided confidence that patients would not be alone in their deprescribing journey.

> *"Well one thing that would help is if I knew someone who'd already been through it previously … So, if there was a friend or neighbour or somebody else who'd stopped the medication and had no problems stopping the medication that might make me think, well, I think I want to give that a try. So, it's a bit of word of mouth." [Patient 14, male, 66]*

> *"Other people's experience… Because other people's experience of taking a lot of medication like myself and have to slowly reduce it, it makes me feel better that I have something I can relate to. You have got some back-up...it is just peace of mind… Confidence in yourself that you are not alone with it and other people have experienced it." [Patient 18, female, 72]*

5.3.2.1.2. Communication and decision-making

As well as the information content delivered by HCPs, patients placed emphasis on how the deprescribing information should be communicated. Patients preferred that deprescribing conversations were verbal, either face-to-face or via telephone, and supplemented with written information about what was discussed from the deprescribing consultation. The provision of written information after the consultation was further expressed through patients wanting to be signposted to additional information sources, such as websites, that they could access in their own time. It was highlighted that having this written information available was beneficial to help remember what had been discussed, to further explain the consultation to carers or family members who had not attended the appointment, and to aid their decision-making after the consultation.

> *"I'd like it face-to-face and also at the same time to be given a leaflet so that when you're actually with somebody you don't always take all the facts onboard. So, to have face-to-face and then to be given a written explanation as well." [Patient 10, female, 87]*

"I think personally I'm okay with verbal, but I accept that quite a lot of people would like it written, not for themselves but for family members to understand." [Patient 2, male, 66]

"There's so much online now and he [GP] could even point you towards a particular website which would explain all these things and you could actually read it yourself and investigate it yourself." [Patient 12, male, 74]

This provision of written information to aid their decision making aligned with patients wishes to be adequately prepared for deprescribing consultations, so they could be more involved in these conversations. They described how this could be through notice of the consultation so that the patient could have time to prepare their thoughts, or through the consultation being split into two parts, where the first consultation would focus on information sharing supplemented with written information (or sign-posted to further resources), and the second consultation would be when a decision would be made, with time in between for patients to reflect on the information and prepare for a decision in the second consultation. Patients placed emphasis on being able to a prepare their own questions about deprescribing before a decision was made.

"I would like a consultation. I would have liked notice of a consultation. In other words, so that I can be prepared. Because I'm afraid I have got older and wiser and realised that sometimes you need to have your own argument." [Patient 17, female, 74]

[How patient imagines doctor would introduce deprescribing] "I'll give you the online information… We'll make an appointment in two weeks' time and then we can come in and we can review. Once you've had a chance, we can talk through it." [Patient 11, female, 66]

Patients placing significance on being adequately prepared for deprescribing conversations complimented the fact that all-but-one patient believed that they could and should be involved in deprescribing conversations. Most patients felt they were ready to be involved in deprescribing conversations.

"I should be involved [in deprescribing discussions] … I believe I can now." [Patient 10, female, 87]

Finally, patients made it clear that there would need to be clear communication between patients and HCPs, especially between those involved in their care, to ensure that deprescribing recommendations were not inconsistent between HCPs. This meant that if an HCP had recommended or conducted deprescribing, another HCP would not

discourage or immediately reverse the decision. Ideally, a decision to deprescribe a medicine would be communicated to all HCPs actively involved in that patient's care and someone would act as a central coordinator to conduct deprescribing.

> *"I think it would be … if [patient's GP] good practice to send that [deprescribing decision] to all the consultants that I'm under the care of, so that they all are in the know, in case I lost the piece of paper. I mean, it's all part of the communication and it's only fairly… a matter of courtesy for one doctor to tell the other what each one of them has done." [Patient 16, female, 68]*

> *"Just to know who's coordinating [deprescribing], rather than have the doctor say one thing and then a pharmacist saying another… And knowing that they're communicating with each other." [Patient 19, female, 72]*

5.3.2.1.3. Pharmacists as a source of advice

When deciding if deprescribing was right for them, most patients highlighted that they would seek advice from a pharmacist, either community- or practice-based. There was an expectation that pharmacists would be able to provide additional advice on the importance of or reasoning for deprescribing, what this might mean to the patient's medicines regimens and any practical changes around medicines management that might need to be considered, such as the supply of medicines post deprescribing. For most patients, the reason for this expectation was because they believed that any type of query or issue related to medicines was best directed to a pharmacist.

> *"Well, I would expect them [community pharmacists] to be able to assist me to, with advice on the effects of [deprescribing], the effects of diminishing the supply and so on." [Patient 1, male, 88]*

> *"I think I would probably go to the GP [when discussing deprescribing] and if they talked about medication, I think I might go to a pharmacist to ask more." [Patient 2, male, 66]*

> *"If I have any queries I would go to a pharmacist in the local chemist." [Patient 10, female, 87]*

The involvement of pharmacists in providing deprescribing advice was also favourable to patients as they valued the idea of additional HCPs being involved in their care. Patients felt that pharmacists could potentially highlight things that had been missed by their GP, and therefore enhance patient care. As a result, patients would welcome the opportunity for pharmacist involvement.

"Yes, definitely, because the thing is, that means they're looking after my welfare, which would be important. I would hate to think they'd … hesitate if they knew something and maybe thought, well, I wonder if the GP knows this, because no one of any profession can keep up with absolutely everything all the time… I'd be happy with that as well." [Patient 7, female, 83]

One patient, who described how they see community pharmacists as a source of medicines-related information, proposed the idea of accessing deprescribing leaflets in community pharmacies. With this idea, the leaflets would act as a gentle introduction to deprescribing which could then be followed up with a consultation with the community pharmacists in the consultation room if the patient had more questions.

"Well information sharing firstly, and a leaflet would probably be fine for that. I don't know whether there are any leaflets about it in the pharmacy, in the chemist shop, I don't know. But to me that would seem a likely place to start. Just to introduce the subject very gently at first. And then perhaps a more one to one talk in the little office when he's got time to ask more questions about it." [Patient 14, male, 66]

When asked about the potential roles of community pharmacists, some patients appreciated the idea of their community pharmacists identifying and communicating deprescribing recommendations to their GP. In this capacity, patients would want community pharmacists to discern the necessity of their medicines to identify potential medicines that could be deprescribed once referred to the patient's GP. However, patients expressed that for community pharmacists to be utilised in this capacity, there had to be a discussion between the pharmacist and the patient about the deprescribing recommendations before the recommendations were sent to their GP. Furthermore, a subsequent consultation with the GP about the recommendations should occur before deprescribing was then initiated.

"'Do I need to be taking these?', and they [community pharmacist] could perhaps contact the doctor and just say he's brought this up, I think there may be some justification, could you see him and even advise and they could take it from there, even could you have an appointment with [the patient]." [Patient 2, male, 66]

"But I wouldn't have a problem [with community pharmacist providing recommendations of suitable medicines to stop to GP], again, as long as … the pharmacist or one of the pharmacists from that chemist is going to have to be

involved in the discussions…with the GP and with myself on the same basis again." [Patient 11, female, 66]

However, patients thought that community pharmacists would need to clarify how they reached such deprescribing recommendations with patients, as some patients were aware that community pharmacists do not have access to full medical records. Due to this, they were unsure how the community pharmacist could make deprescribing recommendations.

"I think it would depend on why they [the pharmacist] were recommending it… Because they don't have your medical records… How he's made the decision that that would be a suitable medication for you to stop?" [Patient 2, male, 66]

5.3.2.2. Monitoring and follow-up

This theme presents the nature of support patients believe they require from HCPs during and after a medicine has been deprescribed. This includes the sub-theme 'safety netting' discussing the frequency of follow-ups post-deprescribing and which HCPs patients would prefer to provide such support. It also includes the subtheme 'self-monitoring and social support' introducing the idea of empowering patients to self-monitor post-deprescribing and social support considerations related to deprescribing.

5.3.2.2.1. Safety netting

Most patients voiced how they felt it was necessary for HCPs to follow-up with patients during and after deprescribing to ensure safety during the process. However, there was a lack of consensus on an agreed follow-up frequency, ranging from weekly and bi-weekly follow-ups to monthly and yearly. Ultimately, patients deemed this was dependant on the medicine being deprescribed, the patient's current clinical status and results from any clinical tests conducted, such as blood tests. In many cases, patients were content to delegate this for the HCP providing support to decide, as they were equipped to decide on this.

"So, I would hope that my doctor would say something like, 'I will see you again in three months' time or whatever and see how it is going. If you have a blood test just before then we will know where we are and then we will take it from there. And then maybe another three months or six months or two weeks or

whatever. There would be that kind of plan and aftercare as it were from the decision to stop." [Patient 8, female, 67]

When deciding who was best to provide support during follow-ups, most patients showed no real preference about who provided this support, as long as they were qualified to do so and that it had been communicated to the patient that the chosen HCP would be providing support. A fundamental reason for this was that patients expressed they may not completely understand the roles, responsibilities, and skills of different HCPs, and so were not able to dictate who was best qualified to provide deprescribing support.

"Oh, well whoever's best equipped at that time. Obviously, there's very little method of understanding the ability of a doctor, or a pharmacist, or a nurse, you know, we're not qualified to be judge and jury on all those professions, they're there to advise us and guide us in what's best for us." [Patient 1, male, 88]

"Anyone who had the knowledge and skills and expertise to be able to assist me. So that could be the pharmacist, it could be the GP, or it could be a practice nurse." [Patient 7, female, 83]

When discussing the potential role of pharmacists in deprescribing, patients also valued the idea that community pharmacists could act as a safety net during deprescribing. This involved community pharmacists contacting patients during or after deprescribing to check how they were feeling, or the community pharmacy being a place for patients to attend if they felt unwell after deprescribing. This provided patients with a contact who would be aware of the deprescribing and would be able to help the patient with queries or if they needed reassurance. One patient compared the idea of this to their experience with the current NHS New Medicine Service (NMS), and so was content to apply this to deprescribing.

"If I have everything in writing, I'm happy with that, then I'll stop the medicine, that's fine. If I realise a week later that I'm not feeling well or I think this may be due because I've stopped the medicine or whatever, I can just walk to my community pharmacy and ask the pharmacist and have a chat." [Patient 12, male, 74]

"I've had that where when I went on the metformin the pharmacist said we'll give you a ring … it's a either a week or a fortnight, just to make sure [everything is ok]. Yeah, fine." [Patient 2, male, 66]

5.3.2.2.2. Self-monitoring and social support

Although follow-up was seen as essential to ensure safety of deprescribing, patients were also cautious that regularly scheduled follow-ups, especially when patients were well, may be unnecessary and increase patient anxiety. Patients were also aware of clinicians having constrained time whilst practicing, as a result of the current NHS workload, and so felt unnecessary follow-ups would exacerbate this. As a result, patients emphasised that it would be beneficial to empower patients to self-monitor after deprescribing, and then consult with an HCP when they felt things were not right. One method of doing so was for patients to keep a personal diary and to record how they felt post deprescribing, and then take this to a scheduled appointment. A patient noted this was a form of patient activation and could help patients to be more involved in their own care, and therefore, help to improve healthcare outcomes.

> *"I wouldn't want to encourage unnecessary check-ups because for some people it's not a good thing, increases the anxiety." [Patient 16, female, 68]*

> *"We're not talking about complex medicines, dangerous medicines here, so there is really not a need to check up unless patient says I can't take it, I'm feeling worse... It could be at the next consultation, or it could be just sending an email back to the GP surgery... But just keep a little journal. Keep a little diary of what happened, your symptoms. That, to me, is very important because, again, that's patient activation, it's getting patients to take care of themselves, to have their own agency." [Patient 12, male, 74]*

Equally, to be best equipped to self-monitor, patients explained that they needed to know potential red flag symptoms to look out for, what to do if these were to occur and the knowledge that if needed, the deprescribed medicine could be restarted. Patients also wanted a point of contact, who did not necessarily have to be their own GP but was aware of the deprescribing and could answer patient queries related to it. This was vital for patients who voiced concerns regarding difficulties contacting HCPs during the COVID-19 pandemic and would not want to be in similar situation during deprescribing.

> *But with the provision that in two or three weeks' time, if I felt that there was something not quite right then I can go back and say you took me off this and I'm feeling this, and perhaps look at reintroducing it." [Patient 2, male, 66]*

> *What I would like is some way of saying there's a dedicated number you can call, where you can leave a message … where presumably, let's say it goes to the nurse … There's some point of contact where if you are feeling concerned you can get through and say, please call me." [Patient 11, female, 66]*

"I think to have the means of easy contact if you're concerned about something, not to have to go through trying to get an appointment, which in itself is a hassle... If I'm in that situation where there's a possibility of something arising I would like to know, who I can turn to immediately?" [Patient 17, female, 74]

The social support available for patients experiencing deprescribing was also discussed. Patients highlighted the potential need for emotional support or counselling as they may be emotionally attached to their medicine and having to stop taking them may disrupt their lifestyle and cause anxiety as a result. In addition, there may be ongoing or acute stressful situations that a patient is experiencing that HCPs are not aware of, which may be intensified by deprescribing. Patients also voiced a possible request for counselling to help with living with their long-term condition. This could then be further expanded to help patients learn of non-pharmacological treatment options that could be combined with deprescribing, such as coping strategies to deal with pain if analgesics were deprescribed.

"I'd hope that the GP looks a little bit further than a script, to be able to support individuals. Now, if I was feeling anxious [about deprescribing], maybe there might be a low intensity therapist that's skilled in people that are subject, or live with long term conditions." [Patient 13, female, 77]

"some people might feel that they want some sort of counselling … but if you're really anxious about this… there may be other things of course that are feeding into the equation… let's say someone was taking some psychotropic drug and the doctor decided that they didn't think they really needed it, but the doctor might not know that in the background, let's just say hypothetically, an abusive husband or something, and there are children to be looked after. So maybe that…there is a reason that he's not aware of that the patient might want to continue." [Patient 17, female, 74]

"So, I mean for example, if it is pain relief [being deprescribed], then there might be other temporary mechanisms they could teach me, like mindfulness or other coping strategies… if they're not the ones that have the time or skills to tell me about those coping strategies, referring me to someone who can." [Patient 19, female, 72]

5.3.2.3. Roles and relationships

This theme describes patient views about the roles and responsibilities of HCPs involved in deprescribing. The subtheme ‘medical hierarchy and understanding the role of pharmacists’ identifies how and why patients placed emphasis on the involvement of different HCPs in deprescribing. The subtheme ‘developed trust and continuity of staff’ presents the interpersonal skills patients felt important for routine deprescribing in primary care. The final subtheme ‘lack of integration and infrastructure for community pharmacists’ describes patient perceptions about current healthcare system readiness to accept and action deprescribing in primary care. This was around the current system barriers that inhibits the routine adoption of deprescribing, particularly for community pharmacists.

5.3.2.3.1. Medical hierarchy and understanding the role of pharmacists

Although participants discussed the involvement of different HCPs, it was evident that patients placed importance on the involvement of their GP in deprescribing. In many cases, patients explained that they would only be happy to accept deprescribing if their GP specifically agreed with the recommendation. In addition, patients expressed how they did not want other HCPs, such as practice pharmacists, to conduct deprescribing independently from their GP and that the patient’s GP had to be involved in the discussions. Some patients stated that they would prefer their GP to propose deprescribing which could then be followed up by another HCP. They key idea was that other HCPs would be working as a team around the GP.

> *“If the GP was happy, I would be happy as well.” [Patient 20, female, 70]*
>
> *“As long as I had that assurance that they are working together as a team.” [Patient 16, female, 68]*
>
> *“I would, if it was advised by the doctor, I would be happy for the GP pharmacist to oversee the reduction or stopping of medication, but I don’t think I would be happy with them initially instigating the process.” [Patient 3, female, 76]*

Patients valued the involvement of pharmacists in different stages of deprescribing, whether practice or community based. Patients recognised pharmacists as medicines specialists, based on their qualifications and training, and could recall positive experiences discussing medicines queries with pharmacists in different settings. As a result, as deprescribing involves medicine use, patients found it ideal that a pharmacist would be involved in the process.

"[receiving] Information. I found that local pharmacists are usually very helpful. You only have to say, can I ask you a question and they either say, yes certainly what is it? Or they say, just a minute I am in the middle of something, are you able to wait a couple of minutes? Yes, they are usually very helpful. There is usually somebody, a pharmacist, who will come and listen to your questions and answer them if they can. Yes. I don't think I have ever found a pharmacist who hasn't been helpful." [Patient 8, female, 67]

A unique advantage of the involvement of practice pharmacists, expressed by patients, was that there is an assumed close working relationship with their GP, which was perceived as beneficial. This again highlighted the importance patients placed on the involvement of their GP. In comparison with practice pharmacists, a unique advantage of the involvement of community pharmacists was the accessibility of community pharmacies which made it easier for patients to get in contact with them. An example given by a participant was if patients needed quick advice regarding deprescribing, they could easily get in contact with their community pharmacist. Again, this view was expressed in light of the COVID-19 pandemic where patients highlighted difficulty getting in contact with other HCPs. In addition, the fact that community pharmacists are independent of GPs, some patients thought that their advice would be impartial and therefore beneficial if they had doubts concerning their own GP's decision.

"If they were a GP-based pharmacist, yeah, I would be fine with that, because the GP there is in close communication." [Patient 3, female, 76]

"I would say the community pharmacists because it would be easier in terms of practicalities. It would be easier for the patient to go to the community pharmacy … you know, having to have yet another appointment putting more work onto the GP surgery for something which is not really that vital." [Patient 8, female, 67]

"Whereas my community pharmacist, I know they don't always agree with GP prescribing, but they're independent from the GP." [Patient 12, male, 74]

Conversely, not every patient welcomed the idea of pharmacist involvement in deprescribing. Some patients explained that they did not fully understand the current role of pharmacists, referring to how they previously understood the responsibility of pharmacists when they were solely in dispensing roles. Some patients thought that the new and developing roles for pharmacists may start to dilute the roles of GPs and that, as pharmacists were viewed as "in the back checking things" [Patient 13], they may

lack interpersonal skills to speak with patients due to a lack of exposure. This reduced patient confidence that pharmacists should be involved in deprescribing.

> *"I don't know the role of the pharmacist really. At one time they were there dispensing medicine. And now they seem to have taken the role that at one time was the GP's. So I don't know whether I'd be comfortable with a pharmacist stopping the medicine." [Patient 4, female, 70]*

> *"I'm not sure about a pharmacist. I have not got the same confidence in pharmacy as I have with nurses and with GPs. And that's purely because I don't think they get the exposure talking to people, pharmacists. You go in the pharmacy, you give your name, you pick up your pills and the pharmacist is in the back checking things for the dispensers and so forth, he's not constantly talking to people." [Patient 15, male, 76]*

One patient explained that some type of professional backing or certificate would be a potential way to help ease the mind of patients about this. Having this on display would help to indicate that a pharmacist is qualified to be involved in deprescribing and can provide reassurance for patients.

> *"If they are happy to, with the cooperation and support from the GPs, that is very good, and, again, if there is a certain cause that tells me as a patient that they are eligible and accredited to do that, I would like and welcome that reassurance. Again, put it on the wall … Yes, and a certificate from the Royal Pharmaceutical Society would be helpful." [Patient 16, female, 68]*

5.3.2.3.2. Developed trust and continuity of staff

Whilst discussing the involvement of different HCPs in deprescribing, patients placed emphasis on the pre-existing developed relationships and trust between patients and HCPs. This developed relationship and trust was pivotal to accepting deprescribing recommendations or support, and when this trust/relationship had previously been perceived as compromised, patients held negative perceptions on the involvement of that HCP. Therefore, in many cases, it was not necessarily important which HCP should be involved in deprescribing based on their profession or skills, but the pre-existing relationship between that HCP and the patient.

> *"Provided I was able to be convinced that the doctor was… or whoever professional, was acting in my best interests which, as I explained in the case that I dealt with, they weren't. Provided I've got that trust in that person then I*

would be satisfied with that guidance... trust is the foundation of keeping the patient and professional relationship going." [Patient 1, male, 88]

"I mean I'm 87 now and I've been taking tablets for 30 odd years, so I'll just be guided by what [the patient's GP] says, I mean I'm just in his hands, he has kept me going all this time... I have, I have great trust in him." [Patient 10, female, 87]

"I think the relationship you've got with them got to be paramount in [deprescribing]. And my GPs can be a little bit matter of fact, where the pharmacist I have a much better relationship, I see him more often." [Patient 14, male, 66]

Patients were concerned with the lack of continuity in seeing the same HCPs involved in deprescribing. Patients articulated how they would want to see the same HCPs involved in deprescribing to be able to build a therapeutic relationship with them if this was not already present. There was a particular concern around continuity with pharmacists, with patients at times feeling that the pharmacist "doesn't know" them due to a lack of history interacting with them, especially if the pharmacists covered multiple practices or community pharmacies.

"Not the pharmacist because a pharmacist doesn't know me. I know they do have a lot to do with medicines in the surgeries." [Patient 5, female, 73]

"But in a tiny GP surgery where the pharmacist is basically working for three different GP surgeries in a week, that doesn't really work. So, if a GP pharmacist, whom I don't know, stopped a medicine, I would... Well, of course I would need something in writing." [Patient 12, male, 74]

[When discussing community pharmacist checking up on patient after deprescribing]

"No, I think I would prefer it coming from the practice … It's, again, continuity of individuals" [Patient 11, female, 66]

There was also concern regarding a potential conflict of interest between practice pharmacists and GPs. One patient believed that, as practice pharmacists work for the GP, practice pharmacists would have to agree to clinical decisions and recommendations made by a GP or else face consequences with their job. This potential conflict of interest would then be detrimental to the patient's trust concerning deprescribing.

"And also, don't forget [practice pharmacists] work for the GP surgery as well. So, they have a conflict of interest. If they don't agree with the prescribing that a GP is doing, they can't really do much about that because they find themselves without a job or involved in a big fight." [Patient 12, male, 74]

Finally, there was also some concern around the involvement of community pharmacy staff other than the pharmacist. Although satisfied with the involvement of community pharmacists in deprescribing, some patients highlighted they would not want to involve other community pharmacy staff such as counter assistants. Patients expressed that they did not trust these staff members and would not want to discuss confidential information with them.

"As long as it was the pharmacist and not just one of the assistants standing behind the counter who was helping." [Patient 10, female, 87]

"There's no guarantee…I would certainly…the only ones I would want contacting me would be the pharmacists… Not the normal sales staff." [Patient 11, female, 66]

5.3.2.3.3. Lack of integration and infrastructure for community pharmacists

One of the key concerns highlighted by patients, when considering how community pharmacists may help with deprescribing, was the lack of integration with wider primary care. This was predominately in the form of lack of access to complete medical records and clinical services, such as ordering and being able to review blood tests. Because of this, multiple patients found it difficult to imagine how community pharmacists might help in deprescribing, as their involvement would be limited by not knowing the patient's full clinical history, or their clinical actions would be limited through not being able to connect with wider primary care services. Conversely, the superior integration seen by practice pharmacists, predominantly being able to access full medical records as highlighted by patients, was favourable for their involvement in deprescribing.

I think the difficulty we have with that is [community] pharmacists can't order, for example, a blood review. So, it would have to go back to the surgery for somebody to authorise blood reviews ... So that would be difficult for me to take in that he or she could simply say, we can stop this." [Patient 15, male, 76]

"No, I don't think they've [community pharmacists] got the knowledge to stop things, because they wouldn't have records of my tests, my blood tests, my high

blood pressure, all of it, whatever, they don't have it, I don't think, all I think they have is what the doctor prescribes for me?" [Patient 9, female, 79]

[Community pharmacists recommending deprescribing] "I'm not sure … Because they don't have your medical records, the pharmacist in the GP surgery would have your medical records and would be able to review those before he made the decision." [Patient 3, female, 76]

The physical environment in which HCPs operate was also important to the implementation of deprescribing. Patients described how it would be important to have a private area available to discuss deprescribing and that, if community pharmacists are to be involved in deprescribing, they would have to have a private consultation room. Patients feared having to discuss their medical history, especially concerning deprescribing, over the counter in a community pharmacy and so a consultation room was essential for these conversations.

"I wouldn't want to be discussing deprescribing with someone waiting to get their prescription or someone who's just queuing up to get cough medicine." [Patient 17, female, 74]

"Well, to have somewhere where the conversations can happen. So, at the moment, and I said earlier, [my community pharmacy] haven't got a room so, you know, I wouldn't really want it to happen over the counter with other people around." [Patient 19, female, 72]

5.4. Discussion

5.4.1. Key findings

5.4.1.1. The importance of a strong deprescribing rationale

When the hypothetical deprescribing scenario was presented to patients it was evidently clear that one of the major questions regarding deprescribing was the motive behind the action. Even when introducing the topic of this research study to patients, patients placed heavy emphasis on knowing how or why deprescribing could be possible. For many patients, they held concerns that it was simply stopping a medicine to help with the NHS budget as opposed to their own health. An NHS priority is to make the best use of limited resources available (Owen et al., 2011). One way this has been achieved is through medicine brand switching where a particular brand is switched to a generic variation due to cost benefits (Ewbank et al., 2018). Many of the participants involved in the interviews had experienced medicine brand switching, and in some cases, without any discussion prior, and understood this to be a financially motivated decision. As a result, they assumed deprescribing was based on the same premise and therefore, were initially dubious about the idea. It was not until it was discussed how deprescribing differs from brand switching, highlighting it is for clinical benefit, did patients then start to appreciate why deprescribing could be beneficial.

In conjunction with fears that deprescribing was a cost-saving exercise, patients also questioned how viable deprescribing is. This was because many patients could recall being told when initiating long-term medicines, that those medicines would be “for life” and so the prospect of then stopping them unlikely. It is important that HCPs address the terminology used when prescribing medicines as this can influence how deprescribing is subsequently perceived. If patients are provided with strong messaging that they should be taking a particular medicine for the rest of their life, and emerging evidence suggests this is no longer the case, it may be difficult to then convince patients otherwise. The practice of evidence-based medicine, which entails a systematic approach to clinical problem-solving by integrating the best available evidence, patient values, and clinical expertise, has undergone continuous evolution (Sackett et al., 2000, Chloros et al., 2022). This evolution is particularly evident in how we approach clinical problems, specifically in the realm of prescribing decisions, because of the growing body of new research in the field of medicine. The increasing awareness of patient safety risks associated with the long-term use of medicines has further strengthened the need to re-evaluate prescribing practices (Nehra et al., 2018,

Chang et al., 2019, Gibson et al., 2022). This is further emphasised by the emerging understanding of the risks associated with problematic polypharmacy, as discussed in Chapter 1 (Dagli and Sharma, 2014). One must also consider the physiological changes that occur as a result of ageing, as well as possible changes in patient treatment goals which can occur alongside ageing (Tinetti et al., 2021). Hence, there is a need to strike a balance between establishing the importance of patient adherence to treatment, but also the possibility that the same medicine prescribed may need to be stopped or changed in the future. Strong messaging of a medicine being for life may make this challenging and places more emphasis on the need of a strong rationale when introducing deprescribing to patients.

In many cases, the importance of a strong deprescribing rationale was further reiterated through patients wanting to be able to take time and consider the evidence around deprescribing before deciding whether to stop a medicine. In multiple cases, patients described how they would prefer a two stage deprescribing consultation where the initial consultation introduces the topic, where information is provided and/or relevant clinical observations are taken, and another consultation where the patient has had time to consider deprescribing and the results of the clinical observations can further justify the need for deprescribing. Within this, patients being provided time to consider the information about deprescribing before making a decision was important. Literature has highlighted the importance of shared decision-making for deprescribing to be enacted effectively (Reeve et al., 2014b). Patients become more informed about potential outcomes as a result of shared decision-making and as a result, often choose conservative treatment options, such as taking fewer medicines, which facilitates deprescribing (Stacey et al., 2017, Jansen et al., 2016). To facilitate shared decision-making, it is crucial to afford patients adequate time to evaluate the evidence presented to them and carefully reflect on the potential benefits and risks associated with deprescribing. This notion aligns with the National Institute for Health and Care Excellence (NICE) guideline on promoting shared decision-making, which emphasises the importance of allowing patients the necessary time to make informed decisions about their treatments (The National Institute for Health and Care Excellence, 2021). In the context of deprescribing, it is similarly essential to provide patients with sufficient time to consider the available evidence before reaching a decision, following the initial introduction of the concept. In juxtaposition, it is important to consider the increased workload to primary care as a result of deprescribing consultations being split into two, as described by patients in this study. Increases in the number of patient consultations in primary care with a lack of HCP recruitment to match this, has led to increased

workloads and compounds added pressures to the NHS (Hobbs et al., 2016). For deprescribing consultation to be routine in primary care, the effect they have on current workloads must be negotiated with the opportunity to allow patients time to reflect on the information provided and encourage their involvement in shared decision-making.

Confidence in the concept of deprescribing plays a vital role in its successful implementation, as it influences the willingness of both patients and HCPs to engage in the necessary work associated with deprescribing and facilitates its normalisation within the primary care setting. Within the context of NPT, confidence emerges as a significant concept within the sub-construct of relational integration, which contributes to the collective action required for deprescribing. To promote the normalisation of deprescribing in primary care, it is crucial to ensure that patients possess the necessary confidence in this approach. Through the analysis of interviews, it became evident that one key factor in instilling confidence among patients was their conviction in the rationale behind deprescribing. Therefore, it is crucial to allocate sufficient time to help patients comprehend why deprescribing is being recommended to them, the process involved, and the potential effects of continuing or discontinuing their medicine. By addressing these aspects, patients can develop the confidence needed to embrace deprescribing as a valid and beneficial approach to their healthcare.

5.4.1.2. Self-monitoring and a reverse NMS

When discussing safety concerning deprescribing, patients felt it was important they had some type of follow-up appointments scheduled with HCPs involved in deprescribing as a form of support. Patients had described that this would be to ensure negative outcomes of deprescribing could be caught before making any relevant condition worse. Interestingly, there was no agreed consensus on how often these follow-up appointments should be, with patients conceding that this would be dependent on the medicine deprescribed, the patient, and potential risk factors. Evidence has underscored the importance of monitoring and following up with patients after medicine withdrawal, especially to maximise patient adherence to deprescribing (Scott et al., 2012). Therefore, it is imperative that a monitoring system is in place when deprescribing in primary care to promote safety. However, the exact nature of such monitoring is likely dependent on the resources available, such as HCPs available, and the clinical context in question. This means, factoring for potential risk factors, the medicine being stopped and the patient themselves.

Interestingly, many patients placed emphasis on being able to self-monitor post-deprescribing. This involved knowing about possible symptoms that would require immediate medical attention, having a point of contact who could help if patients were worried about deprescribing or had deprescribing-related queries, and the possibility of patients keeping a personal diary to record their experiences during the deprescribing journey. Suggestions for patients to self-monitor emerged with some patients debating that the type of medicines that could be deprescribed would not be complex due to their long-term nature, such as antihypertensives. Due to this, non-complex medicines being stopped may not warrant frequent follow-up appointments, which could potentially cause more anxiety than be beneficial if patients were otherwise healthy. In addition, some patients were weary of the constrained time HCPs have for appointments, and so would not want to further burden HCPs with frequent deprescribing follow-ups which were not needed. Like deprescribing consultations, it is important that the additional workload generated from deprescribing follow-ups is balanced with the current resources available in primary care. Deprescribing safety should not be compromised due to the risks attached to the process. But in order for deprescribing to be normalised into primary care, the work associated with deprescribing, including the monitoring required, must be balanced by the impact it has on resources and division of labour, as this can hinder collective action and subsequently normalisation, as explained through NPT (Murray et al., 2010). Healthcare has changed from a paternalistic model, where the doctors were dominant and patients were passive recipients of their care, to a shared decision-making model (Driever et al., 2022). This provides opportunity for patients to be more involved in their care, for example through self-monitoring of long-term conditions (Renskers et al., 2020). Self-monitoring after deprescribing is a form of patient self-management, defined as any action taken by patients to monitor and manage their health conditions, and may encompass aspects of medical, behavioural, or emotional management (Dye et al., 2018). Evidence has shown that empowered patients involved in self-management, especially for chronic conditions, tend to lead to improved health outcomes and reduces the cost of care (McBain et al., 2015). Therefore, the incorporation of self-management within deprescribing in primary care should be harnessed to potentially enhance deprescribing health-related outcomes and limit care costs where possible. The nature of self-monitoring in deprescribing, and how patients can be informed and empowered to be engage with this, should be explored to aid routine deprescribing in primary care.

Several patients expressed their thoughts on the potential role of community pharmacists facilitating as a deprescribing safety net and drew comparisons to the current NHS New Medicine Service (NMS) in the UK. The NMS is a free service that offers follow-up appointments with community pharmacists to support patients who have been prescribed new medicines, particularly for long-term conditions (NHS, 2023). The process typically involves an initial conversation when the patient collects the medicine, during which the community pharmacist explains the service and the patient can choose to participate or decline. Subsequently, two follow-up appointments are scheduled, the first occurring two weeks later and the second two weeks after that, allowing patients to discuss any issues they have encountered since starting the medicine. If patients experience difficulties during this period, the community pharmacist can offer advice on management or refer them back to the prescriber for further consultation (NHS, 2023). Patients drew parallels between this service and the idea of community pharmacists providing support post-deprescribing, envisioning regular contact from the community pharmacist to ensure patients are not encountering any challenges and offering the community pharmacy as a resource for assistance. As a result, patients could envision a similar role for community pharmacists in deprescribing, which has the potential to contribute to the promotion of safety in routine deprescribing within primary care, similar to their involvement in supporting patients when new medicines are prescribed.

5.4.1.3. Patient view on involving pharmacists in deprescribing

During this study, patients described numerous ways in which they envisioned how pharmacists may be involved in deprescribing in primary care. In most cases, this was centred around pharmacists being a source of medicine-related information around deprescribing, due to their medicine specialist background. This included community pharmacies being a starting place for educational deprescribing material for patients such as having leaflets. Patients could recall speaking to community and practice pharmacists about their medicines and envisioned similar roles within deprescribing. In addition, the accessibility of community pharmacists supported patients' views on why they would want such HCPs involved and in what capacity. How patients saw pharmacists is a testament to how the role of pharmacists has evolved from a focus of medicine dispensing to provisions of pharmaceutical services, patient information, and education (Worley et al., 2007, Bradley et al., 2018). In community pharmacy, this has been reflected through changes in professional services, payment structures and

undergraduate education, whilst dispensing process are increasingly handled by trained assistants, freeing up pharmacist time to provide patient focused services (Anderson, 2000, Hindi et al., 2017). This has been further complimented by the introduction of pharmacists into general practice with the goal of improving medicine management in primary care (Bradley et al., 2018). This capacity for patient-facing roles provides opportunity for pharmacists to be more involved in the management of medicines in primary care, which includes deprescribing. Evidence has shown the involvement of pharmacists in deprescribing can be vital to deprescribing success, especially utilising educational interventions and medication reviews (Martin et al., 2018, Ailabouni et al., 2016). Therefore, it is encouraging that patients also hold the view that pharmacists may have an important role in the implementation of routine deprescribing in primary care.

For a few patients, they were happy for pharmacists to be involved in deprescribing in any capacity, if the decision to do so was communicated to them prior and that there would be continuity with the HCPs involved. Patients wanted to know who they could expect to be involved in the deprescribing, and so if a pharmacist was to be involved, this was fine if they had received this information prior. The emphasis patients placed on this communication of those involved in their care goes in hand with how older patients tend to worry about how prescribing decisions are communicated between HCPs, especially at transfers of care (Moen et al., 2009, Ozavci et al., 2021). In addition, patients wanted continuity of the HCPs involved to develop therapeutic relationships. Fragmented care, including poor communication between HCPs and patients, is a known interpersonal barrier to deprescribing in primary care and so it is understandable as to why patients would be concerned about this (Doherty et al., 2020). This was particularly the case for community pharmacists, where patients noted they often interact with different pharmacists working within their pharmacy, making it challenging to develop a therapeutic relationship with them. For these patients, they did not want the pharmacist involved in deprescribing to constantly change as frequently as they have experienced in their local community pharmacy. Therefore, when considering the involvement of community pharmacists in deprescribing, it would be beneficial to understand how this would work in pharmacies that employ multiple pharmacists frequently, such as locum community pharmacists.

On the other hand, some patients questioned the appropriateness of pharmacists being involved in deprescribing entirely. These patients highlighted the fact that they were used to the traditional roles of pharmacists, focused on dispensing duties, and felt that the new evolved roles of pharmacists dilute GP roles. Due to this, they held

reservations about pharmacist being involved in deprescribing. Similarly, there were elements of the medical hierarchy explored, with many patients wanting their GP to be the forefront of the deprescribing care provided. This meant that GPs would initiate deprescribing and other HCPs would not operate without the GP overseeing their actions. For these patients, it will be important that there is understanding on why other HCPs would be involved in deprescribing, and the role their GP plays, especially if they are not the HCP conducting deprescribing.

Understanding patient perceptions of the role of community pharmacists in primary care is crucial for assessing the acceptability of their involvement in deprescribing. Hindi et al., (2017) conducted a systematic review to explore patient and public perspectives on community pharmacy services in the UK. Their review included 30 studies identified through a comprehensive search of eight electronic databases, covering the period from 2005 to 2016. Thematic analysis was employed to synthesise the data (Hindi et al., 2017). The review revealed a low level of public and patient awareness regarding extended pharmacy services, with limited recognition of community pharmacies beyond traditional dispensing roles. Clinical services offered by community pharmacies, including the NMS, were also poorly understood and underutilised. Lack of awareness was attributed to a lack of promotion of these services (Saramunee et al., 2014). One study included identified resistance to acknowledge pharmacists as an essential member of the health-care team, with patients questioning appropriateness of the extended roles of community pharmacists, with perceptions of pharmacists “behind the counter” with roles limited to dispensing and minor conditions. Concerns were raised regarding potential commercial affiliations, financial motives, and perceived limitations in knowledge and training beyond dispensing. Despite this reluctance, participants recognised the expertise of pharmacists in medication-related matters. Common features that enhanced the use of pharmacy services included ease of access and convenience, while perceived lack of privacy and confidentiality acted as barriers. The review highlighted a theme of doctor supremacy, with respondents favouring doctor involvement over pharmacist involvement regardless of the service provided. Patients perceived doctors as possessing superior knowledge and training, and their perceived authority influenced patient acceptance of pharmacist recommendations. Patient trust in pharmacists was often inspired by doctors' confidence in them (Hindi et al., 2017). The review concluded that although patient and public perceptions of community pharmacy services were generally positive, there was a lack of awareness regarding services beyond medicine

supply. The authors recommended further research to explore this area (Hindi et al., 2017).

These findings align with the results of this doctoral study, particularly the recognition of the benefits of community pharmacy expressed by patients. However, the hierarchy of GPs in deprescribing decision-making and patients' limited understanding of pharmacy roles beyond medicine supply were also observed, emphasising the need to increase awareness of the suitability of community pharmacists in deprescribing interventions. There is also the need to build therapeutic relationships and trust between community pharmacists and patients to enhance patient utilisation of pharmacy services.

5.4.2. Implications for intervention design

- To aid patient confidence in deprescribing, it is important to establish a clear rationale for deprescribing. This should include the risks and benefits of deprescribing, how deprescribing will be conducted and red flag symptoms to look out for.
- Patients are motivated to self-monitor after deprescribing. However, to harness this, they require to have a point of contact who is accessible for questions or advice when needed.
- Patients generally accepted the involvement of community and practice pharmacists in deprescribing. However, it must be made clear to patients the nature of their involvement, the suitability to be involved in such capacity, and how their actions will still be overseen or reported back to the patients' GP.

5.4.3. Chapter summary

This chapter has presented the results of the qualitative analysis of 20 interviews conducted with community-dwelling older patients taking ≥5 medicines. Patients highlighted their views on the nature of information to provide when discussing deprescribing, the support they believe is required to keep deprescribing safe, and their views on which HCPs should be involved in the process. Participants highlighted the importance of the deprescribing rationale, including relating this to objective assessments, providing patients an opportunity to consider information about deprescribing prior to a decision, the importance that the decision to deprescribe is communicated with other HCPs involved in their care, and that patients would consult a

pharmacist for further information. Participants also described how they are motivated to monitor themselves post-deprescribing, although this was under the stipulation that there should be a point of contact aware of their deprescribing, who they could access if they had concerns or questions. Participants also expressed that they were content with multiple HCPs being involved in deprescribing, if this had been communicated to them, there is continuity of care, and the patients' GP would still be involved in some capacity.

These findings help to provide initial ideas on how routine deprescribing may be normalised in primary care. In the next chapter (Chapter 6), the findings from focus groups and interviews with HCPs concerning the implementation of routine deprescribing in primary care will be explored. The findings of Chapter 6 will be synthesised with the findings of this chapter, which will inform the co-design study in Chapter 7.

Chapter 6 – Study 2: Healthcare professional interviews

6.1. Introduction

This chapter aims to examine the perspectives of healthcare professionals (HCPs) about the optimal implementation of safe and routine deprescribing practices in primary care. Building on the findings of previous scoping and systematic reviews in Chapters 2 and 4, this empirical study investigates the current state of deprescribing within the healthcare system, the factors necessary for deprescribing to become routine practice, and the safety considerations involved in the process from the viewpoint of HCPs. The data were gathered through semi-structured interviews and focus groups with a diverse group of HCPs, and analysed using the framework analysis method (Furber, 2010).

6.1.1. Aims, objectives, and research questions

The overarching aim of this study was to explore the perspectives of HCPs regarding the implementation of safe and routine deprescribing in primary care.

Objectives were to:

- investigate the current challenges and issues that healthcare professionals face when considering deprescribing in primary care.
- examine the safety measures and strategies employed by healthcare professionals during the deprescribing process in primary care.
- explore the factors that would facilitate the routine implementation of deprescribing practices in primary care from the perspective of healthcare professionals.

Research questions:

- What are the perceptions of healthcare professionals towards deprescribing practices in the current healthcare system?
- What strategies and changes to current healthcare practices can be identified through the perspectives of healthcare professionals to enable deprescribing to become routine practice?
- What are the safety considerations that healthcare professionals could employ to ensure routine and safe deprescribing practices in patient care?

6.2. Methods

6.2.1. NHS Health Research Authority (HRA) Ethical Approval

As this study was designed in combination with the previous study in Chapter 5 involving patients and NHS organisations, this necessitated obtaining ethical approval from the NHS HRA. The ethical approval process is outlined in detail in Section 5.2.1, with reference to REC reference number 21/ES/0020.

The study adhered to ethical principles such as informed consent, confidentiality, the right to withdraw, potential benefits and risks of participation, and provision of IT support, as detailed in 5.2.1. The online format of the study was expected to minimise the burden on HCPs, as participants could partake in the study from the comfort of their own environment, as well as facilitate recruitment of busy HCPs who could not commit to traveling to an interview venue. Additionally, the researcher was able to debrief with academic supervisors immediately after the focus groups or interviews, in case any difficulties were experienced during the study.

6.2.2. Inclusion and exclusion criteria

The inclusion and exclusion for recruiting HCPs are shown in Table 18. Given the central role of GPs in primary care medicines use, their inclusion in this study was deemed essential (Nixon and Vendelø, 2016). Furthermore, the potential benefits of involving pharmacists, as highlighted in Chapters 2 and 4, and the expanding role of practice pharmacists in primary care, justified their inclusion (Peterson et al., 2018). Additionally, to explore perspectives on deprescribing implementation at a senior management and policy level in primary care, Clinical Commissioning Group (CCG) staff responsible for commissioning medicine services were sought. HCPs involved primarily in secondary and tertiary care, as well as those engaged solely in non-patient facing roles, were excluded due to the specific focus of this doctoral research on primary care and patient-related aspects.

Table 18 – Study 2 HCP inclusion and exclusion criteria

Inclusion criteria
GPs including prescribing leads
PCN/Practice Pharmacists with patient-facing roles including reviewing patients' medicines
Community Pharmacists
CCG staff – Involved in the commissioning or provision of prescribing/medication review services e.g. Heads of Medicines Optimisation or involved in the medicines management system
Exclusion criteria
Healthcare professionals whose workload was focused on secondary or tertiary care
Healthcare staff involved solely in non-patient-facing roles

6.2.3. Recruitment

Similar to the previous study, a purposeful sample strategy was utilised to identify and recruit participants that matched the inclusion criteria in Table 18 (Bryman, 2016). As described in 5.2.3, the target sample size ranged from 27 to 42 participants, encompassing a distribution of 15 to 24 patients (Chapter 5) and 12 to 19 HCPs. Recruitment strategies for this study were adapted in accordance with social distancing guidelines during the COVID-19 pandemic, as outlined in Section 5.2.3. A flexible recruitment approach was employed to ensure the success of the recruitment process. To promote the study and provide HCPs with an understanding of its nature, a recruitment poster and information sheet (Appendices R and S) were developed and distributed. The process of disseminating the study to research-active GP practices in West Yorkshire, as described in Section 5.2.3, was utilised to recruit HCPs. Each practice was encouraged to share the study details with eligible HCPs and potential participants were directed to contact the researcher directly to express their interest in the study. The study details were also shared on Twitter and within professional networks of the researcher and academic supervisors.

Once HCPs expressed interest in the study, they were provided with an information sheet and consent form to sign (Appendix T). HCPs were asked to provide their age, gender, ethnicity, and job title to ensure that they met the inclusion criteria and did not

fall within the exclusion criteria. This also facilitated recruiting a range of HCPs ages and genders in order to recruit a diverse sample based on these characteristics. Recruitment continued until the research team decided a sufficient sample size was researched based on available resources, reaching the lower range of the target sample size, remaining timelines, and repetition of emerging themes during ongoing data analysis.

6.2.4. Interview guide

The semi-structured interview guide was developed based on the findings of the scoping review and systematic review conducted in Chapter 2 and 4, respectively (see Appendix U). The guide began with an introduction to differentiate between reactive and proactive deprescribing using a clinical example and to focus participants' thoughts on proactive deprescribing. The guide then explored the barriers and facilitators of implementing deprescribing in primary care, aiming to understand the HCPs' views on how these barriers could be minimised and facilitators promoted. Additionally, the guide examined HCPs' views on the nature of patient education and support and clinician training required for routine and safe deprescribing to occur in primary care. Furthermore, the guide allowed space for discussion on what else may be needed for the optimal implementation of deprescribing in primary care, views on how patient safety may be maintained in deprescribing, and the organisational support available for HCPs to conduct deprescribing. The potential role of pharmacists in deprescribing in primary care was also explored. The interview guide included seven questions that were derived from constructs and sub-constructs of NPT. The construct of collective action was represented by the sub-constructs of contextual integration, which focused on organisational support, and skill set workability, which focused on education and training. The construct of coherence was reflected in the sub-construct of internalisation, which aimed to assess understanding of the value of an intervention. The construct of cognitive participation included the sub-constructs of legitimation, which explored involvement with an intervention, and enrolment, which examined individual buy-in to an intervention. These questions aimed to capture the perspectives of HCPs on the importance and consensus of deprescribing, strategies to enhance engagement with deprescribing, the availability of organisational support for deprescribing, and the education and training needed for deprescribing to become routine. The selection of these sub-constructs and constructs was guided by the researcher's consideration of potential deficiencies in deprescribing implementation,

informed by the findings of Chapters 2 and 4, as well as discussions with the research supervision team.

The interview guide was revised and refined through discussions with the academic supervision team and was piloted with two pharmacists who were not involved in the study. The interview guides for one-to-one interviews and focus groups were identical.

6.2.5. Data collection

Similar to Chapter 5, informed participant consent was collected via the electronic consent form provided with the information sheet, or verbal consent was recorded before the interview or focus group as an alternative. Participants demographics was recorded whilst checking each participant matched the inclusion criteria.

Depending on their preference, HCPs were invited to attend a semi-structured interview or focus groups. Focus groups were up to 90 minutes and conducted online via Microsoft (MS) Teams®, whilst semi-structured interviews were up to 60 minutes and conducted online via MS Teams® or telephone. Interviews and focus groups conducted via MS Teams® were visually recorded using the meeting record functionality and then converted into audio files, whilst telephone interviews were audio recorded using a digital tape recorder. Interviews and focus groups were conducted by the doctoral researcher, whilst a research supervisor was assisted in facilitating focus groups. The researcher also made field notes during the interviews and focus groups to note any relevant observations and allow personal reflections on the process. Audio files were transcribed by an approved external transcription company, 1st Class Secretarial.

6.2.6. Data analysis

The analysis of the interview and focus group transcripts followed the framework analysis approach as described in 5.2.6 (Furber, 2010). An example of the HCP analytical framework can be found in the appendices (Appendix V). The analysis was conducted using the NVIVO®. NPT was utilised in this process to guide the development of interpretations during the framework process, particularly of the NPT derived questions, and to contextualise findings.

6.3. Results

6.3.1. Participant demographics

A total of 30 HCPs were recruited with three online focus groups, eight online interviews and one telephone interview conducted. No repeat interviews or focus groups were conducted. Participant characteristics are shown in Table 19. Overall, the most common age range of participants was 31 – 40 (n=15), whilst more female HCPs were recruited (n=17) than male HCPs (n=13). A diverse range of 8 ethnicities was recruited, with white British being the most common. No non-participants were present during data collection. Focus group duration ranged from 82 minutes to 84 minutes with an average time of 83 minutes. Interview duration ranged from 33 minutes to 63 minutes with and average time of 52.1 minutes. Although transcripts were not returned to participants for corrections, findings were disseminated to participants to provide opportunity for feedback. However, no substantial feedback was received that warranted a change in findings.

Table 19 – Study 2 HCP demographics of study sample

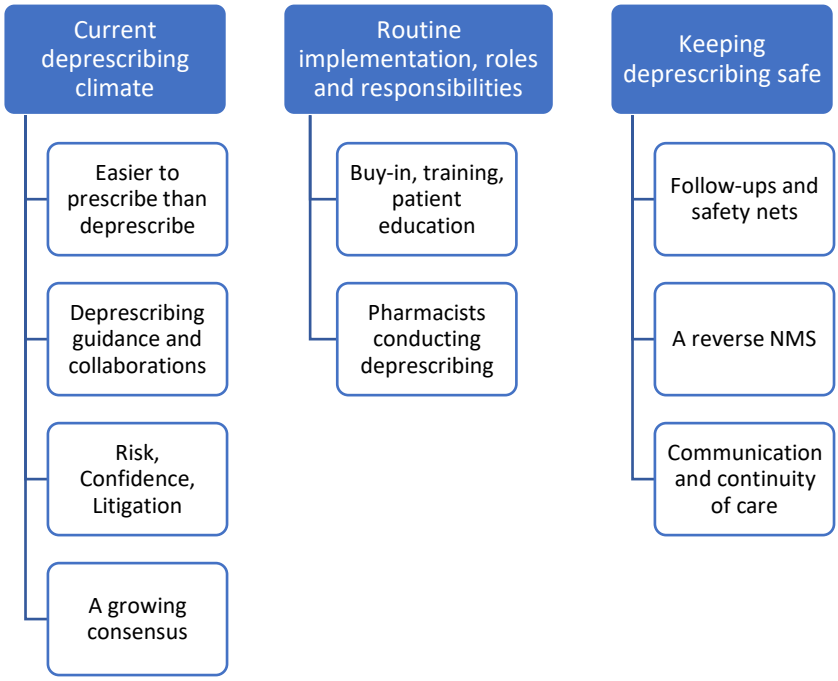
HCP	Age band	Gender	Ethnicity	Job Title	Interview (I) or Focus group (FG)
1	31-40	Male	British Iranian	Practice pharmacist	FG
2	31-40	Male	British Iranian	Practice pharmacist	FG
3	31-40	Male	Indian	Practice pharmacist	FG
4	31-40	Male	White British	Practice pharmacist	FG
5	31-40	Male	Pakistani	Practice pharmacist	FG
6	41-50	Female	White British	Practice pharmacist	FG
7	21-30	Male	British Pakistani	Practice pharmacist	FG
8	41-50	Male	White British	GP	FG
9	31-40	Female	White British	GP	FG
10	51-60	Male	White British	GP	FG
11	51-60	Female	White British	GP	FG

12	31-40	Female	White British	GP	FG
13	31-40	Female	Black African	GP	FG
14	41-50	Female	White British	GP	FG
15	41-50	Female	White British	GP	FG
16	31-40	Female	White British	GP	FG
17	31-40	Female	Black British	Community pharmacist	I
18	21-30	Female	White British	Community Pharmacist	I
19	21-30	Female	White British	Community Pharmacist	I
20	31-40	Male	White British	Community Pharmacist	I
21	21-30	Male	White British	PCN pharmacist	I
22	31-40	Female	White British	PCN pharmacist	I
23	31-40	Male	British Pakistani	Head of Medicines Optimisation	I
24	41-50	Female	British Asian	Community pharmacist	I
25	21-30	Male	White British	Community pharmacist	I
26	21-30	Female	British Asian	PCN Pharmacist	FG
27	31-40	Female	British Pakistani	PCN Pharmacist	FG
28	31-40	Female	Arab	PCN Pharmacist	FG
29	21-30	Male	Indian	PCN Pharmacist	FG
30	31-40	Female	British Pakistani	PCN Pharmacist	FG

6.3.2. Findings from framework analysis

Three themes with nine associated subthemes emerged from the data analysis. The theme ‘Current deprescribing climate’ contained four subthemes ‘Easier to prescribe than deprescribe’, ‘Deprescribing guidance and collaborations’, ‘Risk, confidence, and litigation’, and ‘A growing consensus’. The theme ‘Routine implementation, roles and responsibilities’ comprised of two subthemes ‘Buy-in, training, patient education’ and ‘Pharmacists as a vehicle for deprescribing’. The final theme ‘Keeping deprescribing safe’ encompassed three subthemes ‘Follow-ups and safety nets’, ‘A reverse NMS’ and ‘Communication and continuity of care’.

Figure 6 – Thematic map derived from Framework analysis of HCP interviews



6.3.2.1. Current deprescribing climate

This theme describes HCP views on the current state of deprescribing within healthcare. This comprises of the subthemes: ‘Easier to prescribe than deprescribe’ exploring how elements within current healthcare promote medicine continuation rather than discontinuation, ‘Deprescribing guidance and collaboration’ highlighting the need for guidance and working with other HCPs, patients, and families for deprescribing to occur, ‘Risk, confidence and litigation’ detailing the difficulty quantifying deprescribing risk, the fear of litigation and the influence confidence has in this, and ‘A growing

consensus' describing the growing, collective understanding for the need of deprescribing by stakeholders in primary care.

6.3.2.1.1. Easier to prescribe than deprescribe

When discussing the current barriers of deprescribing with GPs, pharmacists, and CCG staff members, they described multiple factors that impacted on current resources and workloads, making it challenging to routinely deprescribe in primary care. This involved lack of time to routinely deprescribe, competing workloads and pressures that they perceived took priority when compared to deprescribing. In addition, a lack of adequate staffing and funding made it difficult for HCPs to incorporate deprescribing into their current workload. This was particularly problematic for community pharmacists (CP) who were yet to have a defined and established role in deprescribing whilst simultaneously being "under-funded and under-staffed" [HCP 18] and so these factors also served as barriers to having a role in deprescribing.

> *"And also, the time, you know, we've got lots of tasks to deal with and your time might prevent you from putting in the extra minutes to investigate something further." [HCP 6, PP]*

> *"Because, looking at* [community pharmacists] *right now, they're majorly under-funded, under-staffed, really stretched, huge pressures to do everything else in their job description. I don't know if they physically can do it, like, logistically, I mean." [HCP 18, CP]*

Deprescribing was commonly viewed as unguided work, characterised by the need for judgment-based decisions informed by limited information that varied for each patient case. The perception of deprescribing as unguided work stemmed from the requirement to tailor deprescribing strategies to each patient's situation, relying mainly on HCPs' professional expertise, while lacking specific support or guidance for deprescribing decisions. The absence of clear guidance on factors to consider, monitor, or modify during deprescribing led to concerns among HCPs that their decisions may lack adequate support. This stands in stark contrast to the prescribing process, where comprehensive guidance is readily available, enabling structured approach to decision-making based on easily accessible information.

> *"If you look at NICE, there's very specific sort of guidance on there about starting [medicines] stuff. But stopping stuff, it's very much a sort of play it by*

ear and patient…you know, treat each patient individually really. So it's not quite as structured and set in stone, so it comes very much down to opinion." [HCP 6, PCN]

With deprescribing decisions being predominantly judgement-based with a lack of guidance available, HCPs expressed how differences in their views on deprescribing further made it challenging to routinely deprescribe in primary care. HCPs noted that their deprescribing decisions were often resisted, undermined, or changed by other HCPs, particularly senior HCPs who did not agree with deprescribing, leading to demoralisation among HCPs and a sense that their deprescribing efforts were not worthwhile.

"And some GPs are quite resistant to any deprescribing, even things I would think that's absolutely fine like I'd be happy just to take that off myself, but they'd be resistant to it." [HCP 22, PCN]

"Me and XXX have worked together with doctors who have undermined a younger and more proactive opinion in practice…It's a little bit demoralising when you're trying to do what you know to be modern good practice and maybe the more senior partner goes back to medicine of 30 years ago." [HCP 6 PCN]

Another obstacle to routine deprescribing in primary care identified by participants was how medicines had been introduced to patients on initial prescribing. HCPs expressed how patients received education when initiating some medicines with emphasis that the medicine would be "for life" [HCP 23]. It was described that this then led to patients being attached to their medicines, especially after numerous years, making it difficult to change this mindset when the medicine risks outweighed benefits. Furthermore, because of such messaging, patients may see deprescribing as HCPs giving up on their care as they had previously believed the medicine was needed to stay alive. This change of patient mindset away from a medicine being for life was highlighted as necessary for deprescribing to occur, but the sudden switch in mindset was described as hard for patients to make.

"Especially things like aspirin and statins, they said, right, you're on this for life. To take that away from a patient then it's like something's gone wrong in their eyes. Yeah, I think that phrase there 'for life', that needs to go away, that needs to disappear, absolutely." [HCP 23, CCG]

"Another one is maybe patients' attitudes towards it, being like sometimes no matter how much you explain how a medicine is probably going to be doing more harm than good and they've been told they've got this medicine lifelong or

something like that, that that's stuck in their mind, that they're going to take it for the rest of their life." [HCP 21, PCN]

Clinical inertia, described within these interviews as the concept of medicines being easier to continue rather than discontinue, even if deprescribing would benefit the patient, was a prominent factor impeding deprescribing. HCPs described how it felt easier to continue patients on medicines, even if they were no longer providing benefit, because they would rather not do anything that could potentially disrupt the patient's health stability. In many cases, HCPs would rather deal with the acute presenting problem, which normally required prescribing or continuing a medicine, rather than potentially cause more issues through deprescribing. In addition, some HCPs were hesitant to have difficult conversations about deprescribing as it was easier to avoid these conversations instead. This was especially the case if there was uncertainty regarding the time to benefit from a medicine. It was explained that the basis of this clinical inertia was that, if an adverse event were to occur as a result of deprescribing, the HCP would feel like it was their fault. If they had not acted and an adverse event occurs, they felt less likely to be seen at fault.

"I think part of is the clinical inertia… I'm now going to say, well, I think you're getting very frail and I don't know if you're going to live long enough for this medication to work, it's easier to just not have the conversation and move on to the next thing." [HCP 13, GP]

"And it can go both ways but when you've taken an action then the reaction feels like your fault, when you haven't taken an action then you can't be blamed for the reaction almost." [HCP 11, GP]

"I think there's a worry about upsetting the apple cart, that something's going to go terribly wrong ... So, everybody just goes to stable and on they go...I suppose, it's a bit of the inertia but it's more of the fear factor of it." [HCP 10, GP]

6.3.2.1.2. Deprescribing guidance and collaborations

When exploring factors needed for routine deprescribing to occur, HCPs expressed how having access to advice, guidance, relevant prescribing tools, and support for deprescribing was key. HCPs explained that, to encourage deprescribing at a national level, clear and specific guidance on deprescribing needs to be in place to support and encourage deprescribing decisions. This was necessary to help aid their decision

making about deprescribing and provide structure to the practice, shifting away from deprescribing decisions being predominantly judgement-based with minimal support. This also included explicit tools to identify medicines suitable for deprescribing, which further supported their deprescribing decisions. HCPs could recall instances they have been encouraged to stop a medicine which was helped by having clear guidance available.

> *"I think advice is really helpful, you know, whether it's in the form of guidelines." [HCP 12, GP]*

> *"I think it's really useful having certain tools that are available. They're really supportive. Things like STOPP START, being able to calculate anticholinergic burden, you know, and actually seeing in front of you that's a really high score, there's something we need to do about it." [HCP 22, PCN]*

> *"I think if we want to manage or encourage deprescribing on a national scale, there should be, where possible, some clear-cut guidance for deprescribing. I think in the events where we've been encouraged to stop medicines, those have been medicines that have had that criteria in place". [HCP 5, PCN]*

HCP stressed the critical role of a supportive MDT in facilitating deprescribing in primary care. According to HCPs, an MDT that provides deprescribing guidance can assist in making informed deprescribing decisions. Such guidance serves to reinforce HCPs' deprescribing choices and helps HCPs feel supported by their colleagues. Additionally, it allows for the sharing of additional workload arising from deprescribing interventions with other team members. Furthermore, a supportive MDT fosters an environment of reflection and learning, which ultimately improves deprescribing practices.

> *"There's support from the consultant pharmacist, he can take cases too, that you're struggling with or even if it's a retrospective case, you can discuss and see maybe what you could've done differently and then try and learn things that you can implement in the future." [HCP 21, PCN]*

> *"Like an MDT, some kind of clinical team to be able to send tasks in to or send questions in to directly and be able to get a response from them to then know that actually, yeah, we've made this decision together as a multidisciplinary team and it's backed by a doctor or someone specialist in a particular area." [HCP 3, PCN]*

Working with patients and their family and/or carers when deprescribing and involving them in decisions was described as useful in facilitating deprescribing. Through discussions with patients and their carers/family, HCPs were able to understand the patient views on medicines, particularly if the patient believed the medicine to deprescribe was still providing benefit. Patients' families were a source of support for deprescribing for HCPs when they shared similar views on wanting to stop unnecessary medicines. This provided encouragement to HCPs to proceed with deprescribing.

> *"I've also found for elderly patients, talking to the carers, you know, or the family was so helpful because I came across one patient and her daughter had been wanting some of her medicine stopped for quite a long time and just wasn't...getting nowhere with it.*
>
> *And I came along and kind of spotted they were suitable to stop, and she was so grateful, but having her support that she thought it was the right thing as well, that really kind of increased my confidence that it was the right thing to do." [HCP 22, PCN]*

6.3.2.1.3. Risk, confidence, and litigation

Many of the factors that affected how routine deprescribing was considered or conducted were influenced by the confidence and/or experience HCPs had relating to deprescribing. The relationship between confidence and experience was described as dynamic and influential to how involved HCPs would be in deprescribing. This meant that, when HCPs had little experience deprescribing (or prescribing in general), low confidence to deprescribe followed and HCPs were reluctant to deprescribe. The reason for this low confidence was particularly around fear of negative outcomes because of their deprescribing interventions. There was a particular fear of compromising patient safety when deprescribing preventative medicines. The lack of confidence was further exacerbated if the medicine had been prescribed in secondary care. One HCP noted that not being an experienced prescriber also added to a reduced confidence to deprescribe with autonomy.

> *"I think confidence is a big issue for a lot of GPs. So, a lot of the medications that we're considering deprescribing have been started in secondary care and certainly a lot of GPs are fearful about reducing perhaps cardiac medications for secondary prevention for angina, heart failure." [HCP 15, GP]*

> *"I'd say another one is I'm not a prescriber myself yet, I've just completed the prescribing course, but I'm not registered yet, I feel like often it's having to discuss with a prescriber first before stopping a medicine because I'm not at that confidence level where I can just go ahead and do it myself." [HCP 21, PCN]*

However, as HCPs gained more deprescribing experience, their confidence to deprescribe improved. Reasons for this related to HCPs being able to see the positive effect deprescribing had made for patients, but also the lack of adverse reactions from deprescribing. As HCPs gained more experience with deprescribing, especially the follow-ups and monitoring required, they felt they were able deprescribe more routinely. In addition, most, if not all, HCPs could not recall an experience where patient safety was jeopardised through deprescribing.

> *"As times gone on and I have done some deprescribing I feel like that's built my confidence, … Now I do feel more confident now that I've got the experience. I know more about monitoring, and how to monitor and follow up patients that kind of thing. This helped me to deprescribe more routinely." [HCP 28, PCN]*

> *"If you're working very closely with some patients and you keep going back and revisiting them, that would increase your confidence in being able to deprescribe things." [HCP 22, PCN]*

Another factor that impeded HCPs' confidence to deprescribe, affecting how routinely they considered this intervention, was the uncertainty and risks associated with deprescribing. HCPs found it difficult at times to calculate the risks associated with continued medicine use (especially for preventative medicine) and communicating this to patients. Similarly, the uncertainty of the effects of deprescribing added to the risk factors HCPs associated with deprescribing. Because of this uncertainty, HCPs found it difficult to justify the risk of deprescribing compared to the risk of continuing potentially inappropriate medicines (PIMs), which subsequently hampered the confidence needed to routinely deprescribe. As it was difficult to quantify the risk of deprescribing, HCPs also explained how they struggled to then communicate the potential risks and benefits of deprescribing to patients.

> "*What I really don't like deprescribing is preventative things, because you don't know if when you stopped it that was the cause of something or It would have happened anyway, so for example, aspirin for primary prevention. There is no rationale to keep that on, but every time I deprescribe it, even now after I've been in general practice for nearly five years, I'm hesitant thinking how do I*

know that me stopping that isn't then going to lead to a heart attack at some point?" [HCP 26, PCN]

"And individually you can say, yes this will reduce your chance of this and this will reduce your chance of this, but in combination you're on ten tablets, in combination we know that you're just going to get poorly – but you can't quantify that very well." [HCP 11, GP]

When discussing risks and confidence relating to deprescribing, HCPs also explained how they felt about litigation due to deprescribing. HCPs feared legal action if a medicine, particularly for prevention of cardiovascular events, is deprescribed and an adverse reaction were to occur, or a patient became angry about the decision. This fear of the legal consequences would sit on the conscience of HCPs and was made worse by the lack of readily available evidence to support deprescribing decisions, particularly in a legal context. As a result, this would hinder HCPs routinely engaging with deprescribing and would rather continue PIMs instead. HCPs were unsure where they stood legally regarding deprescribing decisions and potential consequences.

"I'll be honest, for me, one of the biggest issues is litigation. I don't want to stop something, the patient gets angry or something happened and end up with, you know, a lawsuit on my hands. Or even the risk of one, I don't want to lose sleep over it, I'll be honest…so it's easier for me to press that button and issue it." [HCP 5, PCN]

"The biggest, biggest fear was … we'll stop the aspirin. Well, are you going to take the blame if they have a TIA? Are you going to take the blame if this happens? Statin was the bloody hardest thing to stop, you know, because obviously the lack of evidence around by deprescribing. Litigation is a big fear." [HCP 23, CCG]

"Litigation. The unwanted consequences. Now I know that obviously you can't…I don't think anyone has actually been sued post a cardiovascular event but it would sit on your conscience wouldn't it if you stopped a patient's cardiac meds." [HCP 7, PCN]

6.3.2.1.4. A growing consensus

HCPs highlighted a recent but growing consensus on the awareness, benefits, and importance of deprescribing in primary care. Increased national focus on the negative impact of polypharmacy on patients and the healthcare system, coupled with the use of

deprescribing in Structured Medication Reviews (SMRs), has helped to drive this consensus through greater awareness of deprescribing as a prescribing decision. As a result, HCPs explained that deprescribing is now being seen as an area of practice that should be embedded into routine practice.

> *"I would say yes. More so now, I think we feel more confident now more so than ever… it's almost like it's a national lever that's been pulled. So, you have stuff that gets done in place and in local areas. And try as you might, you will get some buy-in and sometimes you don't. But when you've got a big national lever like NHS England coming in and dropping a DES* [Network Contract Directed Enhanced Service] *like that, that says yes, you must look at polypharmacy and deprescribing in your structured medication reviews, it does add that heft to it." [HCP 23, CCG]*

> *"Yes, I think so. But I think that's just quite recently. I think if you asked me that five years ago, I probably wouldn't have agreed as much with you. I think deprescribing is becoming a thing and what I mean by that is it's becoming an area of practice, and I think it's recognised that it needs to be embedded within routine practice, like prescribing and reviewing and monitoring." [HCP 19, CP]*

However, although HCPs agreed with the need for deprescribing to combat problematic polypharmacy, it was not believed that a complete consensus on deprescribing has been reached. HCPs described how they believe only a minority of HCPs place a priority on implementing deprescribing into their own practice. Factors concerning deprescribing, predominantly how the routine practice should be implemented into primary care and whether HCPs believe it's their responsibility to be involved in deprescribing, were areas that HCPs have yet to reach consensus on. This was highlighted within the interviews where community pharmacists did not believe other community pharmacists would see deprescribing as their own responsibility. Other HCPs also described how HCPs may see deprescribing as important but something that will be addressed at a later stage for the patient by a different HCP.

> *"So, I think everybody would see it as important, but what my niggle is, whether they see it as something that they can do. You know, you can recognise something's really important, but whether it's your job or not, is kind of different." [HCP 19, CP]*

> *"I think you'll find individual pockets, you find champions for deprescribing. You find people who are really interested in it and really want to push the agenda. But I don't think there's consensus. As a profession, we are a lot more*

obsessed with trying to solve the problem at hand, which is adding in more prescriptions …and then somebody else is going to review that polypharmacy at a later stage. But does anyone review that polypharmacy at a later stage? That's yet to be seen." [HCP 7, PCN]

"What I found is, you get GPs who are really passionate about medicines and they're really, really kind of like really hot on the topic [deprescribing] *... Other GPs, maybe not so. And I feel as if the former group is in the minority." [HCP 23, CCG]*

In relation to patients, although there were variations, most HCPs recalled positive responses to deprescribing conversations by patients. HCPs experienced patients welcoming deprescribing due to expressing a preference to take fewer tablets, particularly as they grew older. HCPs mentioned that some patients would want to take fewer tablets but would not tell anyone, until the topic of deprescribing was introduced, allowing for this preference to be discussed. This would then help encounters around deprescribing to be productive for both patients and HCPs.

"I have a lot of patients that say, I hate taking tablets, I hate taking tablets... Especially as I think people get older as well, they don't like rattling with tablets." [HCP 20, CP]

"Yeah, I think there is a big range, there are patients who just take what they've been told to take but they're not too happy about it but they've never mentioned it to anybody. When you do go in and say, maybe there's a chance we could stop this or maybe it's not doing that much good for you anymore and they are keen to stop it, those encounters always go quite well 'cause it's a positive outcome for everyone." [HCP 21, PCN]

HCPs have acknowledged the significance of enhancing patient consensus on deprescribing. It was found that patient understanding is crucial in establishing the notion that deprescribing is not merely a cost-cutting exercise, similar to how patients perceived undertaking brand switches. Furthermore, patients must comprehend the benefits of deprescribing to recognise that it is not abandonment of care. HCPs recounted instances where patients raised such concerns, often prompted by rumours from other patients, which consequently necessitated a defensive approach from HCPs towards deprescribing decisions.

"Whereas some are very defensive and they feel like it's a cost-cutting exercise or they feel like you're sort of giving up on them. I've had a few elderly patients who have had conversations about stopping medicines… I think they

sometimes take that as, well, that's it, that's the end of my life, you're giving up on me kind of thing." [HCP 2, PCN]

"I think some patients can be a little bit negative in the respect that I know I've heard before, is it because the NHS can't afford it, is that why you're taking me off my medication? Is it because it's a postcode lottery and I can't have it anymore because my postcode doesn't fit it." [HCP 14, GP]

6.3.2.2. Routine implementation, roles and responsibilities

This theme explores HCP views on what is needed for deprescribing to become routine practice and the roles and responsibilities needed for this to happen. This includes two subthemes: 'Buy-in, training and patient education' exploring the need for stakeholder investment into deprescribing and the nature of HCP training and patient education required for routine deprescribing, and 'Pharmacists conducting deprescribing' discussing HCP views on the role pharmacists have in implementing routine deprescribing in primary care.

6.3.2.2.1. Buy-in, training and patient education

When discussing how the implementation of routine deprescribing could work in primary care, HCPs expressed the importance of stakeholder buy-in by those who would be involved in deprescribing. Stakeholder buy-in was broadly described as the willingness to support and/or participate in deprescribing interventions within primary care. This was important to ensure any service developed did not compete with other services already offered or negatively affect staff workload. In addition, deprescribing would need to be viewed in a positive light by policymakers, patients and HCPs and promoted internally with all staff so that staff would routinely consider it within their practice.

"The first thing to do would be to get buy-in from the rest of primary care. So the first thing to do would be to sit down with GPs, nurses, whoever, to say right, this is the problem we've got around complex polypharmacy. We are thinking about developing a service, what does that service look like?" [HCP 19, CP]

"And that means as an organisation we have to actually believe this to be a good thing and actively promote it throughout our staff." [HCP 13, GP]

Another key aspect was training for current and future healthcare professionals. This encompassed considering deprescribing from "day zero" [HCP 23], when prescribing or circumstances where HCPs are reviewing medicines, even during opportunistic situations for other presenting concerns. It was described that such teaching would be useful in the independent prescribing course for pharmacists or as learning modules for continued professional development. The aim of such teaching was to increase knowledge about how to deprescribe effectively and safely, and to help HCPs make a transition from addressing every clinical problem with a prescription to being more judicious when considering starting a new medicine.

> *"I would say the only way I can see it being instituted on a regular basis would be…it's about day zero prescribing. So it's about educating a new generation of GPs that…when they're starting new medicines, to be really cautious and wary about why they're starting it and move away from a prescription culture" [HCP 23, CCG]*

> *"Education. It would be useful to have modules in the prescribing qualification for pharmacists. It would be useful if the people that run educational training events for pharmacist like CPPE* [Centre for Pharmacy Postgraduate Education]... *if they had modules on deprescribing courses, virtual events, evening events." [HCP 22, PCN]*

Similarly, for community pharmacists to be involved in deprescribing, HCPs highlighted a particular need for community pharmacists to have deprescribing training. This was important to ensure a consistent deprescribing message from different HCPs to avoid confusing patients and so that community pharmacists involved with deprescribing do not default to addressing patient problems by suggesting another medicine (whether over-the-counter or to be prescribed). One pharmacist suggested this should consist of two components: clinical deprescribing knowledge and how to enact/be involved in deprescribing. This would provide the clinical knowledge and skills needed to be involved in deprescribing, but also training to know which protocols to follow within a deprescribing service.

> *"If we're going to do this training, then they* [community pharmacists] *need to be part of that training as well. Because if they are still looking at solifenacin* [medicine for incontinence] *is a good, good, good drug, and it reduces your chance of wetting the bed, and not looking at its anticholinergic burden, then we're having two different conversations with the same patient, who just goes home confused" [HCP 7, PCN]*

"Yeah, I think [community pharmacists] *should. I think I'd probably break it up into two bits. I'd break it up into knowledge. So thinking about complex polypharmacy, thinking about how medicines are potentially more risky in older people… Thinking about the process of deprescribing, about how they should do it. And even if you develop a service, I think it's important to train them about the specifics of the service. So about what protocols would they follow? How would they communicate it? How would they document it? How would they follow it up? So that would be required of the training" [HCP 19, CP]*

HCPs explained that it was essential that patients were also recipients of educational messages about deprescribing. Accordingly, patients should understand what deprescribing is, the different models of deprescribing, for example (slow titration or complete stop), the benefits of deprescribing and why an HCP might suggest it for them. Educational messaging for patients on the need for deprescribing may also empower patients to be a stimulus for deprescribing through initiating deprescribing or medication review conversations. However, it was important that the nature of deprescribing education did not encourage patients to simply stop taking all their medicines, leading to non-adherence to essential medicines. Therefore, deprescribing education would need to strike a balance between the importance of stopping unnecessary medicines and the need to continue necessary medicines. HCPs suggested this patient education could be through patient information campaigns involving posters, leaflets, or built-in education within the NHS app.

"I suppose education and material for patients … why couldn't the act of deprescribing, why couldn't the act of a review of their medicines be initiated by a patient as well? Some sort of posters, campaign that patients can see, are you on more than whatever it is, 10, 15 medicines, do you feel your medicines are a burden on you, would you like to discuss this with somebody who has the skills and the knowledge to be able to review the appropriateness of that?" [HCP 7, PCN]

"I think if you get too involved with stopping medication and trying to reduce tablet burden, I think sometimes patients feel like they need to stop all their medicines and they end up stopping stuff that…really needs to be carried on. So, I think it's just giving that sort of education." [HCP 2, PCN]

"Why not have it in that NHS app? I feel like there's so much potential for integrating different functionalities within there, and if there was a tab where it

was like, this is my recent consultations, and these are the things I've had recently done to my medicines, it would fit perfectly in there." [HCP 18, CP]

6.3.2.2.2. Pharmacists conducting deprescribing

HCPs explained that PCN pharmacists are currently best situated to identify and conduct deprescribing due to deprescribing being part of SMRs. As such, this meant that PCN pharmacists should have protected time to conduct extensive SMRs that address the necessity of every medicine a patient is taking to highlight potential deprescribing opportunities. This identified PCN pharmacists as a primary HCP responsible in ensuring routine deprescribing occurs in primary care.

> *"So the PCN pharmacists and pharmacy technicians, so that's what they would do. So they're enacting on the structured medication review DES* [Network Contract Directed Enhanced Service]*, which is obviously heavily focused on that" [HCP 23, CCG]*

> *"[PCN Pharmacists] are doing the structured medication reviews now … you're looking at what can be deprescribed. So, it's part of that process. So, for every patient that has a structured medication review, deprescribing should be considered" [HCP 22, PCN]*

However, there was discussion about community pharmacists identifying patients who might benefit from deprescribing to refer onwards. This included through conducting medicines reviews and discerning the indication of medicines, providing an opinion about whether the medicine is needed or by identifying ADRs experienced by patients. Similar to the former Medicine Use Review Service (MUR), which involved community pharmacists conducting annual consultations with patients to discuss their medicine use, community pharmacists have the potential to provide feedback to GPs based on their findings for subsequent action (Latif, 2017). GPs noted that such a role would be important through being able to link medicines to the reasons they were initiated, so that they could make a more educated deprescribing decision. Various community pharmacist interviewees were keen on this role as they believed their knowledge in medicine use made them appropriate HCPs to identify when medicines were being used longer than typically necessary.

> *"I think the main role that we [community pharmacists] could have is first of all highlighting the medications that we think, hmm, I don't know whether this is necessary, so that's one of the roles." [HCP 17, CP]*

"I see community pharmacy as more of like an identifying sort of stage or even like a messenger type of stage … kind of what used to happen with the old MUR feedback forms. So when they did an MUR, if there was something that wasn't quite right, you would get a feedback form in general practice and it would say, please can you have a word with Mrs Jones." [HCP 5, PCN]

"I think community pharmacists could be involved in undertaking medication reviews, within a structured framework... Certain medications we know, you take them for a long time and the benefits are not really there… So having those discussions about actually when was the last time you tried to reduce them. What happens when you try to reduce them? So I think some sort of structured discussion about those medicines potentially looking to determine with the patient are they still needed?" [HCP 19, CP]

However, although such a role was described as useful and needed, barriers to community pharmacist involvement were often raised. Barriers included the limited access community pharmacists had to complete medical records which could impair their ability to know why a medicine was prescribed, limited communication with other health teams, and a potential conflict of interest due to reduced dispensing volumes and associated income. Also, without community pharmacists having access to full medical records and a complete picture of a patient's care, there was concern this could lead to excessive non-indicated referrals, unnecessarily increasing the workload of other HCPs.

"I think there's a bit of a conflict of interest with some of the community pharmacists, they get paid for dispensing and so it's a bit difficult. And often they don't have full access to the patient's notes so they're not seeing the patient in a round, they're just seeing a load of medication." [HCP 10, GP]

"I think that's the issue we're getting at the moment, in some places we get some pharmacists, who are clearly very knowledgeable but they're also very keen and have a sensitive trigger finger to refer everybody. And we tend to get some really inappropriate referrals… I think it's finding that balance between avoiding that sensitive trigger finger to send everybody on, you shouldn't be on this, you shouldn't be on that…I think the information plays a huge part in that because if they have the ability to have a look at the patient as a whole and then make a clinical decision, it would be a more sensible decision." [HCP 5, PCN]

6.3.2.3. Keeping deprescribing safe

This theme explores the perceptions and attitudes of HCPs regarding the maintenance of safety during deprescribing in primary care. It encompasses three subthemes: "Follow-ups and safety nets," which explores how the use of follow-up interventions and adequately preparing patients to manage potential adverse effects can promote deprescribing safety, "A reverse New Medicine Service (NMS)" which outlines the potential involvement of community pharmacists in an intervention that would follow-up with patients and provide feedback on deprescribing interventions, and "Communication and continuity of care" emphasising the significance of effective communication and continuity of care in ensuring the safety of deprescribing practices.

6.3.2.3.1. Follow-ups and safety nets

Most HCPs expressed a nuanced appreciation of deprescribing's safety risks. Specifically, HCPs acknowledged the potential for adverse outcomes resulting from deprescribing a medicine that was providing therapeutic benefit to the patient, leading to exacerbation of symptoms or disease progression. Additionally, HCPs also recognised that deprescribing could result in the loss of long-term therapeutic benefits of a medicine, withdrawal symptoms, and reduced patient confidence in the event of unfavourable outcomes. Given the possibility of such risks, some HCPs expressed concerns that patients may become reticent to attempt deprescribing in the future.

> *"There's the risk that the patient was actually getting a benefit from the medication that you're deprescribing and then you take it away and they lose that and it's like, well why have you stopped this, I want to restart it, they've lost a bit of confidence and maybe be a bit more reluctant to stop medications in the future." [HCP 21, PCN]*

> *"I think the main risk is, if you stop it, and they should still be on it, what happens? So, it all depends on the indication for the medication. Like, why do they even need it in the first place and then what's the result from that." [HCP 18, CP]*

HCPs highlighted that the main way they would look to mitigate such risks was to ensure patients were adequately monitored through organising follow-ups with patients. The nature of these follow-ups would depend on the medicine being deprescribed and the potential adverse effects of deprescribing it. So, medicines, such

as opioids, would have a different nature of follow up due to the risk of withdrawal symptoms in comparison to other medicines not typically associated with withdrawal symptoms, such as statins.

> *"I've always tried to follow it up. Things that jump to mind what I've stopped recently are things like amitriptyline for nerve pain. And I do try and arrange some sort of follow-up in a few weeks. I think that does help with the patients' perspective and, you know, checking that they have got some sort of follow-up booked." [HCP 2, PCN]*

> *"So I think safety netting is one thing that's really important, to monitor patients. To again, not just have, if you like, a one-off deprescribing episode. To follow the patient up regularly." [HCP 19, CP]*

> *"if you deprescribe opioids or something like that, you know if you don't do it the correct way you'll start getting withdrawal symptoms. I think it depends on the medication really." [HCP 27, PCN]*

These follow-up procedures were deemed crucial by the participating HCPs in ensuring the safe implementation of deprescribing. Furthermore, follow-up appointments enabled HCPs to monitor patients' deprescribing progress, gather insights from the experience, particularly in relation to the associated safety elements and the absence of ADRs, and subsequently improve their deprescribing practices. Conversely, when HCPs were unable to allocate sufficient resources or time for arranging deprescribing follow-ups, they may have been hesitant to initiate the deprescribing process, concerned that they would be unable to ensure the patient's safety.

> *"I generally I'm quite happy to deprescribe most things, it's just when it's things like that where I can't follow up and check on something and in terms of what makes you more comfortable, I suppose XXX said, it's that experience and it's the fact that when you follow up after the change, the patient still alive and nothing bad happened." [HCP 3, PCN]*

> *"The follow-ups* [making deprescribing safer] *and then I suppose to facilitate that, you need the resource to be able to do it. I think XXX said earlier was very honest in that sometimes you may deter yourself from having that discussion because there is no capacity to follow up. And I think having that capacity to be able to follow up because at the end of the day, we all want to give patients that gold standard and if you don't have capacity, you don't have the resource, how do you?" [HCP 7, PCN]*

To minimise the risks of deprescribing and promote safety, HCPs also expressed the importance of adequately safety-netting patients after deprescribing. This intervention diverged from the previously discussed follow-up measures and centred on ensuring that patients were well-informed about where to seek assistance and guidance in the event of any adverse effects or concerns related to deprescribing. The initiative would also encompass contingency strategies for resuming the discontinued medication if deemed necessary.

> *"If [the patient] need to go back to the dose that you were on, I will have a safety net plan and I'm going to follow up with like an appointment in three weeks and then let me know what was going on." [HCP 27, PCN]*

> *"I think, yeah, follow ups and to check how they're doing once the medication's been stopped … And having someone to contact if they do need support in between those follow up calls or visits." [HCP 21, PCN]*

6.3.2.3.2. A reverse New Medicine Service

When discussing potential roles of community pharmacists in deprescribing, the idea of community pharmacists being a safety net or involved in a follow-up system was consistently raised. An idea developed of a service where community pharmacists would follow-up with patients who had recently had a medicine deprescribed. In addition, the community pharmacy would also be a place for patients to ask questions or visit if they had issues, they believed stemmed from deprescribing. This idea was likened to the current New Medicine Service (NMS), where community pharmacists organise follow-up appointments with patients starting a new long-term medicine to check on the patient's wellbeing, as it would follow similar timelines and responsibilities of the current NMS service (NHS, 2023).

> *"But I definitely think there's a role for* [community pharmacists] *in terms of following up. So for example, if you stopped a medicine and if a service was put in place, like the NMS, NDM? newly deprescribed medicine service? And as part of that service, they would follow up the patient in four weeks and then ring them up again, just like they do in NMS, how are you getting on, has your reflux come back, you know, how's your blood pressure, come in and we'll do your BP as well." [HCP 1, PCN]*

> *"Let's say, a medication was stopped by the GP, that could be flagged up by them to the community pharmacy for them to follow up, so it would be then*

handled in a similar way as the new medicine service in terms of you would then contact the patient, okay, fine, I understand that this medication has been stopped, I'm going to just give you a series of phone calls or you can come in, we can discuss and just monitor how you're getting on. And then reassuring them as well that whatever you report, I'm going to report back to the GP just to make sure that they're aware and we're following up on issues to do with deprescribing.

So I think it would work well just the same as the new medicine service, deprescribing monitoring could work very similarly" [HCP 17, CP]

HCPs described how this would be helpful to patients because community pharmacies are accessible, and therapeutic relationships were already developed between pharmacists and patients. HCPs expressed that it is helpful that patients obtain their medicines from community pharmacies and so this could be a convenient environment and location to accommodate deprescribing conversations. It was also viewed as within the current scope of practice for pharmacists by multiple HCP roles within the interviews.

"Think that would be a good idea, absolutely. I think that's a point of call for that because, as I say, then the GP, you know, they can carry on focusing on the other clinical side of things and the patient wouldn't have to make an appointment. They could just pop in." [HCP 20, CP]

"I think that's not an outlandish idea, I think it falls within the current scope, there's already a basis for it. I think the good thing about that then as well is, I think the community pharmacist is ideally placed then to have that conversation. Now that you've stopped your painkillers, now that you've stopped your statins, now that you've stopped your muscle rubs... How are you actually feeling? Are you getting those hypos? Those conversations that you don't necessarily get to have with a GP, I think that's actually a very good idea." [HCP 23, CCG]

"Yeah, I think that'd be quite good 'cause patients usually have a good relationship with their pharmacist, they might see them if they're going to collect their medicines, things like that. It would be a good opportunity for it to be followed up that way." [HCP 21, PCN]

However, HCPs explained that it would be important for community pharmacists to be equipped to conduct the necessary monitoring for the deprescribed medicine within this service. For example, being able to take blood pressure measurements when an anti-hypertensive has been deprescribed, in which this form of clinical measurements

already occurs in community pharmacies. However, this was as opposed to taking blood tests, which is not performed within the current NMS service or within community pharmacy in general but may be required to adequately monitor some discontinued medicines. And if an adverse reaction were to arise, community pharmacists should have a variety of tools and non-pharmacological interventions available to them to address these where possible, rather than simply recommending another medicine and re-contributing to polypharmacy or an automatic referral back to the GP.

> *"I suppose, the only difficulty for me is that if an answer for them is another drug, not so keen on that, whereas I think what you need is other tools in your toolbox so, you know, to help your insomnia or your bladder stuff. And so, some of that needs to have a slightly more clinical focus, I suppose, than more tablets." [HCP 10, GP]*

> *"Yes. It would depend on the medicine, I think. But for example, if you were to stop a blood pressure medication, could a pharmacist check somebody's blood pressure? Yeah, absolutely. I think that would be a perfect role for them... Anything that really requires something like maybe a blood test or something. Something like that, the community pharmacists tend not to get involved in." [HCP 19, CP]*

6.3.2.3.3. Communication and continuity of care

HCPs explained how they mitigated deprescribing safety risks through the style and content of deprescribing discussions with patients and their families. This was regarding how they delivered the decision to deprescribe to patients (and ensuring patients understand why the HCP has come to that decision), understanding patients' thoughts on the deprescribing rationale, considering what patients can expect following deprescribing and ensuring patients were central in these discussions.

> *"I think it's also about communication again with the patient, and letting them know what to expect, so for example, like, stopping the PPI* [Protein Pump Inhibitor] *it's telling them to expect a bit of a rebound of symptoms. And I think if the patient knows what's going to come, they are more likely to be on board with it and continue with it and persevere through with it." [HCP 9, GP]*

> *"If we think about that relationship* [deprescribing] *risk, it's having the discussions correctly with the person that's at the centre. So, it's all about the language you're using, the consultation style, the way you communicate*

verbally and non-verbally. But there's also an element... So, I think being safe in that manner, you know, acting as a professional." [HCP 18, CP]

HCPs stressed the significance of effective communication and continuity of care among HCPs involved in deprescribing, as it was considered integral to ensuring patient safety. Maintaining a sense of connectedness and ongoing engagement with patients during the deprescribing process, as well as preventing other HCPs from reinstating the deprescribed medicine without a clear understanding of why it was ceased, were deemed crucial. HCPs asserted that adequate documentation and seamless communication among healthcare providers were essential in achieving these objectives.

"I think with mitigating risk I think continuity of care is really important because patients often find sometimes they're quite abandoned if we stop something and then if, like, a rebound symptoms happens then they speak to somebody else or… You know, a good example is a patient that's well known to our practice who we ring every day. And we stopped so many medications, so his complications start and stop, the main thing is bowel pain and then all he does is rings out of hours and they prescribe the very same thing we stopped." [HCP 8, GP]

"So, make sure that everybody is informed about the decision that needs to be. So, the patient knows, carers know, family know, GP's aware, that it's documented well in the journal... That's what I find very difficult, is when things just get stopped and there's no explanation." [HCP 22, PC].

6.4. Discussion

6.4.1. Key findings

6.4.1.1. Overcoming the barriers to implementation

This qualitative study elucidated the factors that impede deprescribing efforts in current healthcare settings as perceived by HCPs. HCPs expressed concerns about the lack of comprehensive deprescribing guidance and resources, which contributed to a perception of deprescribing as a judgment-based practice with limited supporting information. This led to a sense of unstructured and unguided decision-making and practice, with minimal materials available to justify and substantiate deprescribing choices. The resistance to deprescribing was further exacerbated by varying opinions among HCPs, with some more senior professionals undermining deprescribing attempts. These factors contributed to clinical inertia, as HCPs found it easier to continue prescribing medicines rather than discontinuing them. Challenges in assessing the potential risks associated with ongoing medicine use, as well as fears regarding the consequences of deprescribing, including patient safety and the possibility of litigation, further influenced HCPs' initial confidence in deprescribing.

Conversely, instances where HCPs were provided with clear and concise deprescribing guidance, enabling them to structure their deprescribing approach and support their decision-making, resulted in more frequent instances of deprescribing. Additionally, collaborative efforts with other HCPs as part of an MDT in deprescribing work proved beneficial. This collaboration provided access to advice from additional HCPs, distributed the deprescribing workload, and fostered an environment of reflection and shared learning among HCPs. As HCPs gained more experience in deprescribing, their confidence in engaging with the practice increased, leading to greater involvement in deprescribing activities.

Similar findings have been identified in literature, with insufficient tools and resources for deprescribing being consistent barriers reported in deprescribing literature, especially within primary care environments (Doherty et al., 2020). This encompassed staffing difficulties such has shortages and high staff turnover rates. It is well established in literature that the effective use and deployment of HCPs is vital to ensure service delivery in terms of cost, quality and quantity (Ozcan et al., 1995). Sufficient staffing levels play a critical role in establishing a congruence between patient needs and the competencies of HCPs, thereby often resulting in enhanced patient safety outcomes (Halm, 2019). Nevertheless, it is equally important to consider

the capabilities, opportunities, and motivations of HCPs in order to comprehend their behaviours towards complex healthcare interventions (Michie et al., 2011).

Despite the extensive literature available on the impact of inadequate staffing levels and its consequential effects on patient safety and care quality, the majority of evidence is situated within the context of nursing homes when in primary care, or secondary and tertiary care settings entirely (Ree and Wiig, 2019, McKeown et al., 2019, Hariyati et al., 2022). However, there is a paucity of literature specifically investigating the influence of staffing levels on primary care services for community-dwelling patients, such as general practices. Nonetheless, it is plausible to gather insights from the findings and experiences within nursing home contexts to shed light on this aspect.

A qualitative study, exploring overprescribing of psychotropic medicines in nursing homes in Australia, investigated the organisational climate factors that influenced psychotropic medicine use. This study conducted semi-structured interviews with 40 on-site and visiting staff in various nursing homes, which included specialist medical practitioners, GPs, pharmacists, nurses, and nursing home managers. The study found that on-site staff were requesting the initiation of psychotropic medicines for patients to help cope with high workloads as a result of inadequate staffing (Sawan et al., 2017). Dose reductions and stopping psychotropic medicines was also unwelcomed by staff due to the belief this would increase behaviour disturbances and further increase staff workload (Sawan et al., 2017). Such evidence perpetuates how inadequate staffing can not only lead to the prescribing of problematic medicines, but also discourage the deprescribing of medicines due to the subsequent increase in workload. Nevertheless, it is crucial to acknowledge the limitations inherent in making direct comparisons between the context of this study and the specific focus of this doctoral research. Nursing homes offer a more intensive care service characterised by close supervision and medicines management by HCPs, which differs from the care provided to community-dwelling patients who typically manage their medicines independently. However, it is important to take into account the detrimental impact of insufficient staffing on the discouragement of medicine discontinuation and the prescribing of potentially inappropriate medications (PIMs), as well as the body of literature exploring the associations between inadequate healthcare professional staffing and resulting compromised quality of care services and patient safety concerns (Hariyati et al., 2022, Ree and Wiig, 2019).

Workforce challenges in the NHS present a threat to the efficient deployment of current and future health services, such as deprescribing. A Kings Fund report in 2018

explored the factors contributing to the current NHS workforce shortage and identified poor workforce planning as a significant contributor (The King's Fund, 2018). This report also highlighted that if staff shortages continue, healthcare providers may not have staff able to deliver commissioned additional services. For deprescribing to become routine practice, even as a commissioned service, it is important that it does not exacerbate NHS staffing shortages and can be implemented with the current available workforce, or it will continue to face difficulties in being actioned. Workforce planning, described as ensuring that '*the right people with the right competences are in the right jobs at the right time*', must be utilised to minimise further exacerbation of staffing concerns within the NHS (Willis et al., 2018). Required areas to be considered through workforce planning include defining all HCPs involved in deprescribing within primary care, what roles they would have and the resources available to fund such roles.

Adequate workforce planning would also be required to enrich MDT involvement in deprescribing in primary care. However, there is a paucity of evidence investigating MDT approaches to deprescribing in primary care involving community-dwelling patients. A study by Kua et al*.,* investigated the effect of an MDT approach to deprescribing within older adults in primary care nursing homes in Singapore. In this multicentre stepped-wedge RCT, the MDT intervention approach involved pharmacists conducting medication reviews and identifying PIMs, discussing the feasibility of deprescribing with nurses involved in residents' care, communication through nurses to physicians to review and action deprescribing recommendations, and all three disciplines were involved in monitoring the patient post-deprescribing (Kua et al., 2021). The study found a reduction in mortality (HR 0.16, 95% CI 0.07, 0.41; $p < .001$) and number of hospitalised residents (HR 0.16, 95% CI 0.10, 0.26; $p < .001$) as a result (Kua et al., 2021). Overall, this study advocated for an MDT approach to deprescribing and was able to identify the potential benefits of such approach. This provides a challenge as evidence advocates for MDT involvement, however this must be balance with current staffing obstacles in the NHS. However, translating the findings from this study to a UK primary care context may not be simple. As previously mentioned, a nursing home environment involves different medicine management process compared those experienced by community-dwelling patients in the UK. Within this study, this included the frequent visitation by nurses, pharmacists, and doctors to residents, which would not be common in a community setting.

HCPs identified a lack of resources and guides as a barrier to deprescribing in clinical practice. However, increasing the availability of deprescribing resources may not be

sufficient alone and the importance of evaluating the use, feasibility, and impact of deprescribing resources should not be overlooked. Reeve et al., (2020) conducted a review of deprescribing tools and guidelines, highlighting their potential benefits for addressing barriers to deprescribing. The review identified seven types of tools: general deprescribing guidance, generic (non-drug specific) deprescribing frameworks, Drug-specific deprescribing guidelines/guides, electronic clinical decision support systems, tools for identifying PIMs), tools for engaging patients and others (Reeve, 2020). This variation in deprescribing resources highlighted diverse ways and domains within the deprescribing process where HCPs can be supported through the utilisation of these resources. Yet, only a few had been evaluated in practice and their effectiveness in increasing deprescribing is unclear (Reeve, 2020). Furthermore, while deprescribing tools and guidelines may help address some barriers, such as a lack of awareness of PIMs, they may not be effective for other barriers, such as time limitations (Reeve, 2020). These findings come in a timely manner where the availability of deprescribing tools and resources has been increasing and introduces the risk of ineffective deprescribing tools saturating the available choices for HCPs. Future research should continue to explore and evaluate the optimal utilisation of deprescribing resources in primary care.

6.4.1.2. Making deprescribing normalised practice

A major factor hindering the implementation of deprescribing in primary care was the pervading prescribing culture. In this study, this was identified as the phenomena whereby HCPs find it easier to prescribe compared with deprescribing due to the current pressures, influences, and structures of modern-day healthcare. Many of the drivers of polypharmacy, as described in Chapter 1, influence this culture such as an ageing population and the use of single disease clinical practice guidelines that rarely consider deprescribing (Bennett et al., 2021). The perception that patient satisfaction is dependent on whether a medicine is prescribed or not also contributes to this (Martinez et al., 2018). There is a need for a culture shift away from simply providing prescriptions and towards patient-centred care with the focus of patients being on the minimum effective number of medicines as possible.

As described within this study, a possible route away from prescription culture is through stakeholder buy-in to deprescribing interventions. The idea of ‘buy-in’ within healthcare typically involves personal and professional commitment to actively engage in a process, task or initiative and without this, HCPs are unlikely to commit to a level of

which is needed for active engagement (French-Bravo and Crow, 2015). Stakeholder engagement has also been identified within the MRC guidance for developing complex healthcare interventions to enhance adherence and end user adoption of the intervention (Shrestha et al., 2022, Skivington et al., 2021). Within deprescribing, key stakeholders are patients, carers, HCPs, and policy makers actively engaging with the idea of deprescribing or deprescribing interventions. Understanding work needed to enrol individuals to engage, and so buy-in, with a new practice resides in the construct of cognitive participation within NPT (Finch et al., 2012). By focusing on the construct of cognitive participation in NPT, there are four theoretical domains in which stakeholder buy-in into deprescribing may be enhanced, derived from the four sub-constructs of cognitive participation (Table 20).

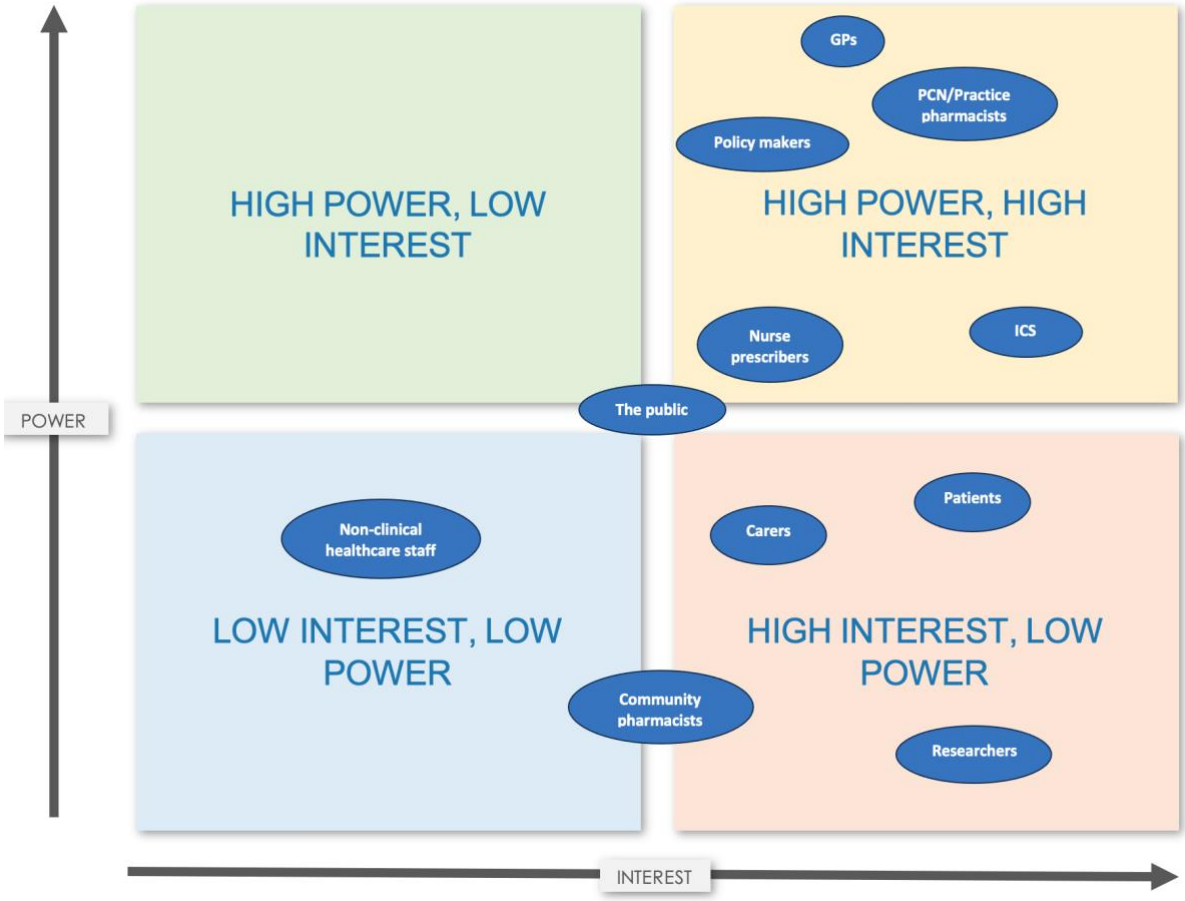
Table 20 – Subconstructs of cognitive participation and their application to deprescribing adapted from Huddlestone et al. (2020)

Sub-construct	Application to deprescribing
Enrolment	Do stakeholders believe they are the correct people to drive forward deprescribing implementation in primary care?
Initiation	Are stakeholders willing and able to engage others in the implementation?
Activation	Can stakeholders identify what tasks and activities are required to sustain deprescribing in primary care?
Legitimation	Do stakeholders believe it is appropriate for them to be involved in deprescribing in primary care.

Under the sub-construct of enrolment, stakeholders must believe they are the correct people to drive deprescribing implementation in primary care. This presents the initial challenge in defining the stakeholders involved in deprescribing, as there are a lack of studies identifying multiple stakeholder groups in deprescribing research (Warmoth et al., 2020). Within healthcare interventions, stakeholders are typically defined as those who can affect or are affected by the intervention, which in this case is deprescribing

(Schiller et al., 2013). Using this definition, the stakeholders previously identified within deprescribing literature, and the relevant stakeholders identified within this doctoral research, the identified stakeholders involved are shown in the stakeholder map below (Warmoth et al., 2020, McCarthy et al., 2022b, Rasmussen et al., 2021, Heinrich et al., 2023).

Figure 7 – Deprescribing stakeholder map



In the stakeholder mapping exercise, stakeholders were positioned along two dimensions - power and interest - based on their potential to deprescribe or commission deprescribing services and their level of benefit or involvement in deprescribing. Those with the ability to directly influence deprescribing through their professional roles, such as PCN pharmacists and GPs, were positioned higher on the power scale due to their direct impact on deprescribing implementation (Anderson et al., 2020, Ammerman et al., 2019). Conversely, stakeholders were placed on the interest scale based on their potential benefits from deprescribing or their role in identifying and disseminating deprescribing evidence. For example, patients stood to benefit from reducing PIMs, while researchers played a crucial role in generating deprescribing evidence (Omuya et al., 2023, Thompson et al., 2019). The placement of

community pharmacists on the boundaries of high and low interest was influenced by their varying involvement in deprescribing practices, their commitment to safe and effective care, and the varying opinions regarding their responsibility and involvement in deprescribing (Farrell et al., 2019, Korenvain et al., 2020). Lastly, the public was positioned at the centre of the map to underscore their potential for both high or low interest and power, depending on their level of awareness and understanding of problematic polypharmacy and buy-in to deprescribing, as highlighted by the need for public campaigns identified in the study.

It is imperative that all stakeholder groups exhibit willingness and capability to engage with other stakeholders within the intervention, particularly in relation to the initiation sub-construct. In the context of patient care, this could be achieved through the implementation of a MDT approach to deprescribing, as discussed earlier, where multiple HCPs and the patient collaborate in the deprescribing process. However, to create a deprescribing culture that permeates beyond the immediate clinical setting and involves the stakeholders identified in Figure 7, broader adoption is necessary. This entails incorporating stakeholder perspectives, views, and beliefs into the development of implementation strategies. Such an inclusive approach facilitates comprehensive stakeholder engagement and fosters a sense of ownership and commitment to the intervention's success.

The current body of literature on stakeholder engagement with deprescribing initiatives in primary care, specifically among community-dwelling patients, is limited. Most of the available research has focused on long-term care facilities, leaving a gap in understanding stakeholder perspectives in community settings. In light of this gap, it may be valuable to draw insights from the existing literature on stakeholder engagement in long-term care as a starting point. A recent study conducted by Heinrich et al., (2023) exemplifies the utilisation of stakeholder engagement, coupled with behavioural science principles, within long-term care (LTC) facilities. The study designed to design an implementation strategy to enhance HCPs engagement with deprescribing for frail older adults in LTC. This research methodology presents a valuable framework that can be adapted to identify effective methods of stakeholder engagement with the various stakeholders depicted in Figure 7, thereby fostering the development of a widespread deprescribing culture.

Initially, the study involved mapping the factors influencing deprescribing in LTC to behaviour change techniques (BCTs) using the Behaviour Change Wheel (BCW) and BCT taxonomies. Subsequently, a Delphi survey was conducted, involving general practitioners, pharmacists, nurses, geriatricians, and psychiatrists, to determine the

feasible BCTs that could support deprescribing efforts (Heinrich et al., 2023). To promote widescale deprescribing adoption, this methodology could be modified to include stakeholders from Figure 7, particularly those with high power and high or low interest, as well as those with high interest and low power.

The study's methodology concluded with a roundtable discussion involving the aforementioned HCPs to prioritise the factors influencing deprescribing and tailor the implementation strategies accordingly (Heinrich et al., 2023). Similarly, this aspect of the methodology could be expanded to incorporate additional high-power stakeholders from Figure 7, aiming for widescale implementation strategies across primary care. Through such stakeholder engagement approaches, stakeholders can gain a deeper understanding of their pivotal role in driving implementation (enrolment), enhance their ability and willingness to engage others by considering diverse perspectives (initiation), identify the necessary tasks to sustain deprescribing implementation (activation), and emphasise the importance of each stakeholder group's involvement in primary care deprescribing (legitimation).

6.4.1.3. Ensuring deprescribing is safe

HCPs participating in the study expressed concerns and apprehension regarding the risks associated with deprescribing, echoing the sentiments outlined in Chapter 1. However, a specific challenge raised by HCPs was the difficulty in quantifying the risk associated with both continued medicine use and discontinuation, as well as effectively communicating this risk to patients. This challenge was particularly evident when dealing with preventive medications, where HCPs acknowledged uncertainties surrounding their efficacy in older patients and the potential occurrence of ADEs following deprescribing. The deprescribing of preventive medicines can pose significant challenges, especially in cases where there is a lack of clinical markers to monitor for potential adverse events for which the medicine was initially prescribed (Reeve et al., 2018a). This can be further exacerbated by the general lack of evidence for medicine use the older patients due to a lack of representation in clinical trials, as described in Chapter 1 (Bourgeois et al., 2017). Consequently, there may be limited methods available to predict if an adverse event will occur until it manifests, thereby potentially compromising patient safety.

The ECSTATIC study conducted in 2018 aimed to assess the deprescribing of preventative cardiovascular medicines in general practice for patients with a predicted low CVD risk. This cluster randomised non-inferiority trial focused on individuals aged

40-70 without established CVD who were using antihypertensive or lipid-lowering medications as preventive treatment (Luymes et al., 2016). Among the study population subgroup of 492 participants, 319 individuals successfully had their medicine deprescribed, and 135 participants remained without the deprescribed medicine after 2 years.

The findings revealed that patients who had stopped the deprescribed preventative medicine after 2 years exhibited significantly higher systolic blood pressure (6 mmHg, $p < 0.05$), diastolic blood pressure (4 mmHg, $p < 0.05$), and total cholesterol levels (7 mg/dl, $p < 0.05$) compared to the usual care group (Luymes et al., 2018). The study concluded that deprescribing cardiovascular preventative medicines in low CVD risk patients was safe in the short term when regular monitoring of blood pressure and cholesterol levels was conducted. However, it is important to note that the study's follow-up period was limited to 2 years, raising questions about the long-term safety of deprescribing preventive medicines beyond this timeframe.

Furthermore, a higher proportion of participants in the study restarted the preventative medicine within the 2-year period compared to those who remained without it. Although the reasons for restarting the medicine were not reported, this aspect raises concerns regarding the feasibility of deprescribing preventive medication if the medicine is eventually resumed by the patient due to an increase in risk factors associated with ageing.

While the ECSTATIC study provided evidence supporting the safety of deprescribing preventative medicines, the lack of investigation into the long-term (beyond 2 years) risk of developing CVD after deprescribing raises important questions. Further research is needed to explore the extended safety implications of deprescribing preventive medicines and to understand the factors contributing to restarting medicines among patients.

The ECSTATIC study, as well as the findings from this doctoral research, highlight the importance of adequate monitoring in maintaining the safety of deprescribing interventions. Patient monitoring throughout the deprescribing journey was identified as a crucial element in both studies to detect any significant changes in the patient's health status and facilitate necessary clinical examinations or observations. Additionally, safety netting strategies to ensure that patients were aware of where to seek help or what actions to take in the event of health changes following deprescribing were also voiced to help maintain safety.

Existing literature also emphasises the significance of patient-centred monitoring during and after deprescribing to mitigate the associated risks and ensure patient safety. This approach recognises the need for ongoing vigilance and proactive management to promptly address any potential adverse effects or complications that may arise during the deprescribing process. By actively monitoring patients, HCPs can effectively track their progress, identify any red flags, and intervene promptly to minimise harm (Reeve et al., 2018a, Scott et al., 2015).

Implementing patient-centred monitoring practices as an integral part of the deprescribing process is essential for optimising patient safety and well-being. It serves as a critical step in deprescribing implementation, allowing healthcare providers to closely assess patient responses, address questions and concerns, and make informed decisions based on individual needs and circumstances. By adopting a comprehensive monitoring framework, HCPs can navigate the challenges associated with deprescribing and ensure that patients receive the necessary support and care throughout their deprescribing journey.

One such way of doing this was through community pharmacists in a similar fashion to the current New Medicine Service (NMS) within the NHS. The underpinning evidence for this service has highlighted an increase in patient adherence, potential for improved patient outcomes and reduced overall healthcare costs because of the NMS service (Elliott et al., 2016, Elliott et al., 2020). Therefore, it's important that a reverse NMS concept for deprescribing can learn from its predecessor to maximise its potential in primary care.

Lucas and Blenkinsopp (2015) investigated the experiences and perceptions of community pharmacists regarding the NMS using semi-structured interviews. Pharmacists reported positive experiences with the NMS, describing the service as valuable, enhancing their professional role and allowing for patient-centred care. Pharmacists could also recall positive perceptions from patients such as optimism and greater appreciation for the community pharmacist role (Lucas and Blenkinsopp, 2015). However, the study also highlighted challenges faced by community pharmacists in delivering the NMS. There was a perceived need for improved publicity of the service and of the capabilities of the community pharmacists involved, whilst collaborations with different HCPs varied across the country. In addition, administrative processes such as target setting and managing follow-up calls were seen as problematic at times (Lucas and Blenkinsopp, 2015). Overall, the study highlighted the positive influence the NMS service had, through the views of community pharmacists, and the potential areas that hindered implementation.

Utilising the knowledge gained from the NMS, there is potential for the development of a reverse NMS service. However, to effectively implement such a service, it is imperative to enhance public awareness regarding its existence and the role of community pharmacists in providing this service. This can potentially be achieved through targeted public health education initiatives focused on the benefits and necessity of deprescribing (Glanz and Bishop, 2010).

Furthermore, it is crucial to equip community pharmacists with the necessary resources and tools to carry out the reverse NMS service. This includes ensuring that they have the capacity to incorporate the service into their workload, providing the appropriate resources for effectively monitoring deprescribing outcomes, and appropriate payment for conducting such services. Adequate training and support should be provided to empower pharmacists in delivering the service with confidence and competence. Collaboration between community pharmacy and other primary care healthcare sectors should be encouraged to facilitate information sharing. This collaboration will enable HCPs to make more informed decisions and facilitate seamless referrals to other healthcare providers when necessary.

To ensure the practical implementation of the reverse NMS service within current primary care systems, further research is warranted. Feasibility studies are needed to assess the viability and effectiveness of this intervention. This research should also explore the logistical aspects of integrating the reverse NMS service into existing healthcare frameworks and identify any barriers or challenges that may arise. By addressing these considerations, it is possible to enhance the implementation of the reverse NMS service and improve deprescribing safety practices in primary care. This will ultimately contribute to improved patient outcomes and medicine management.

6.4.2. Implications for intervention design

- Community pharmacists may be ideally positioned to monitor patients after deprescribing, due to their accessibility and established relationships with patients. However, the monitoring required must be feasible with the current resources' community pharmacists have available. Monitoring that requires invasive procedures, such as blood tests, are unlikely to be practicable.
- A wide range of stakeholder perspectives should be considered when designing deprescribing implementation strategies and developing a deprescribing culture. This can subsequently improve the normalisation potential of deprescribing in primary care.

6.4.3. Chapter summary

This chapter presents the qualitative findings from three focus groups and nine interviews involving HCPs engaged in deprescribing within primary care. The discussions with HCPs revolved around the existing barriers to deprescribing, potential factors that could enhance deprescribing frequency, and the emerging consensus among HCPs regarding the importance of deprescribing. Additionally, participants recognised the significance of widespread stakeholder buy-in in shaping a deprescribing culture, while acknowledging the role of practice pharmacists as the key HCPs involved in deprescribing. Ensuring the safety of deprescribing was also a crucial aspect discussed, with HCPs emphasising the need for thorough patient monitoring during and after the deprescribing process.

These findings, in conjunction with the findings presented in Chapter 5, will serve as valuable insight for the co-design in Chapter 7. These insights will inform the collaborative development of resources and interventions aimed at normalising routine deprescribing within primary care. By leveraging the knowledge gained from this research, the co-design process will aim to create effective resources that support HCPs in their deprescribing efforts and facilitate the integration of deprescribing as a routine practice in primary care settings.

Chapter 7 – Co-design study: Developing deprescribing resources

7.1. Introduction

This chapter outlines the final study conducted for this doctoral research. It uses a co-design method, involving patients and HCPs, to identify and develop resources that may aid the implementation of safe and routine deprescribing in primary care. This builds on the findings from the scoping review (Chapter 2), systematic review (Chapter 4), patient interviews (Chapter 5), and HCP interviews (Chapter 6) which inform the co-design process. Logic modelling will then be used to conceptualise the intervention ideas identified through the co-design workshops.

7.1.1. Aims and research questions

Aims:

- To generate ideas, with patients and HCPs, to support the implementation of safe and routine deprescribing in primary care.
- To use logic modelling to further develop and conceptualise the outputs of the co-design workshops.

Research question:

- What nature of resources would aid the implementation of safe and routine deprescribing in primary care?

7.2. Methods

7.2.1. Co-design methodology

As discussed in Chapter 3, Section 3.1, co-design methodologies have gained prominence in healthcare research, particularly in ensuring that research objectives align with the needs and perspectives of those affected by the outcomes (Antonini, 2021). Within the realm of healthcare research, co-design represents a multi-stage process involving active engagement of patients, caregivers, and HCPs to identify strategies for designing and delivering enhanced healthcare services (Fylan et al., 2021). At its core, co-design facilitates collaboration among relevant stakeholders to develop and refine innovative solutions. Various iterations of co-design methodologies have been documented in the healthcare literature, demanding a thoughtful selection of the most appropriate approach for this study.

One such co-design methodology that has gained traction in healthcare research is experience-based co-design (EBCD) (Fylan et al., 2021). EBCD seeks to leverage the insights and experiences of service users and providers to identify opportunities for service improvement. This is accomplished through the exploration of patients' prior encounters with healthcare services, commonly referred to as touchpoints (Fylan et al., 2021). The key steps involved in EBCD, as outlined by Fylan et al. (2021), include:

1. Project setup, involving the establishment of a steering group.
2. Observations of service delivery and interviews conducted with patients and staff.
3. Staff and patient interviews to delve into their respective care experiences, aiming to identify emotional touchpoints. These interviews are often recorded.
4. Development of a trigger film, utilising the recorded interviews, to effectively convey the experiences and impacts of the emotional touchpoints.
5. Meetings with staff to review the observations and interviews, facilitating the identification of priority areas for improvement.
6. Meetings with patients to view the trigger film, construct an emotional map of their experiences, and collaboratively determine priorities for change.
7. Joint meetings involving patients and staff to collectively watch and discuss the trigger film, subsequently agreeing upon priority areas for service enhancement.
8. Facilitated co-design groups with the active involvement of patients and staff, aiming to develop tools or redesign services based on the agreed-upon priorities.

9. A celebratory event to reflect on the EBCD process and acknowledge the contributions made by participants.

This meticulous and comprehensive process has yielded the development of several complex healthcare interventions and has contributed to the overall improvement in the quality of healthcare services (Fylan et al., 2021, Green et al., 2020).

The initial intention of the researcher was to employ the EBCD approach. However, subsequent deliberations with the research supervision team, coupled with considerations of remaining resources and time constraints, led to the determination that this approach was not feasible. Consequently, alternative strategies were devised, whereby select components of the EBCD process, specifically steps 7 and 8, would be incorporated to inform the co-design methods employed in this study. Additionally, it was acknowledged that steps 1, 2, and 3 of the EBCD process had already been accomplished through the qualitative investigations conducted in Chapters 5 and 6. The ensuing sections expound upon the precise methodologies implemented to facilitate this adapted co-design process.

7.2.2. Ethical approval

Traditional ethical review practices look to minimise potential harm to research participants through ensuring research methodologies are rigorous, research participants know what they are signing up to, and the potential study benefits outweigh possible risks to safety or confidentiality (Goodyear-Smith et al., 2015). Attainment of these objectives are achieved through confirming research methods and interventions are carefully defined and ensuring study protocols are strictly adhered too. However, these established processes encounter a challenge when presented with co-design research, which is characterised by its adaptive and pragmatic nature. The inherently unpredictable nature of co-design renders it unfeasible to anticipate the subsequent interventions and outcomes prior to research initiation (Goodyear-Smith et al., 2015). This has produced a grey area on the appropriateness of traditional ethical approval processes for co-design research.

The HRA decision tool, a tool produced by the UK Policy Framework for Health and Social Care Research to define research, was consulted to determine if co-design would be research requiring NHS ethical approval. However, it was recognised that the co-design did not attempt to generalise or transfer findings or outputs. Due to this, this co-design study was not assessed to be research by the HRA decision tool and, as a result, ethical approval was not required. Nevertheless, ethical principles were adhered

to including ensuring patients were adequately informed on the nature of the co-design workshops using participant information sheets prior to providing consent, and the appropriate management of identifiable data such as participant names and workshop recordings, as previously discussed in Chapter 5 and 6.

7.2.3. Participants selected for workshops

As stated previously, evidence has highlighted how the involvement of patients and key stakeholders in co-design processes is important for intervention development (Boyd et al., 2012). Similarly to previous chapters, as older adults are at higher risk of problematic polypharmacy, and GPs are central to the use of medicines in primary care, both were identified to be included in this study (Dagli and Sharma, 2014). The potentially beneficial involvement of pharmacists highlighted in Chapters 2 and 4, together with the findings about how pharmacists could be involved in deprescribing in primary care from chapter 5 and 6, warranted the involvement of both primary care and community pharmacists in this study. In summary, community-dwelling older patients (≥65 years old), taking ≥5 medicines, and practicing GPs, primary care pharmacists and community pharmacists were involved.

Following discussions with the research supervision team and PPIE, it was agreed that a total of five patients and five HCPs would be recruited for two co-design workshops. To ensure equitable power dynamics between patients and HCPs during the co-design process, equal-sized groups of participants from both cohorts were employed. This approach aligns with the recommendations put forth in co-design studies, aiming to mitigate the inhibition of either patients or HCPs in contributing to the collaborative design process (Farr, 2018). In addition, a total of 10 participants was chosen to ensure participants could be split into two groups of five that could be facilitated effectively online, with an emphasis on participants feeling their input was recognised within the workshops. It was planned that the five HCPs would consist of two GPs, two primary care pharmacists and one community pharmacist.

7.2.4. Recruitment

The method of recruitment was primarily through social media, and research networks. Recruitment posters and research summaries for patients (Appendix W) and HCPs (Appendix X) were developed to disseminate information about the workshops and contact details of the researcher so potential participants could express interest. These

were then shared on Twitter and sent to patients in the YH PSTRC Safety In Numbers Group (SING). As fewer participants were required for this study, in comparison to the previous qualitative work conducted for this thesis, fewer recruitment pathways were utilised to avoid over recruitment.

Once potential participants expressed interest in the study, the researcher contacted them by email and requested information regarding their age, gender, number of medicines currently taking (for patient participants), current job title (for HCP participants) and if participants could commit to attending both co-design workshops. By collecting this information, the researcher could ensure participants matched the inclusion criteria, select participants able to be involved in both co-design workshops and maximise demographic diversity in the participants selected. In addition, participants were offered an £80 voucher for each workshop attended as a token of appreciation for their involvement, in line with the NIHR payment for participation guidelines (INVOLVE, 2020).

7.2.5. Co-design workshops

In discussions with the supervisory team, it was decided that the co-design process would be conducted over two online workshops. This decision was reached because, although COVID-19 social distancing restrictions were easing at the time of the study, online workshops would not place older patients involved in the study under unnecessary COVID-19 infection risk. The nature of online workshops allowed flexibility for HCPs to participate in the workshops as they could be involved from any geographic location within the UK and so, would limit the time needed away from work. This was a necessary consideration as the workshops were scheduled during working hours (from 13:00 to 14:30). Albeit having advantages, it was important to acknowledge the limitations associated with the online co-design approach. One such limitation pertained to the potential challenges in effectively engaging participants in the collaborative process, primarily stemming from their physical absence during the sessions. To mitigate this issue, guidance was sought from the PPIE group on strategies to foster sustained participant engagement. Further details on these strategies can be found in section 7.2.6 of this chapter. Advice was also sought from fellow doctoral researchers who had incorporated online co-design into their research methods.

Each workshop was designed to be one hour and 30 minutes long, with a 10-minute break in between. The workshop duration was chosen to allow sufficient time for in-

depth discussions coupled with various workshop activities, however, looked to avoid overburdening participants with a lengthy co-design workshop. Workshops were conducted on Zoom® as the researcher was confident using the break-out rooms and screen share function to facilitate the workshops, as opposed to other online meeting systems, such as MS Teams®. Miro, an online visual collaboration platform, was selected as a tool to aid the workshop facilitation. Miro allows for users to co-produce 'boards', which allow freedom on how boards are designed and allow multiple users to use these boards to facilitate collaborative activities. Miro was chosen as it provided a suitable platform to capture key discussion points and ideas in a visually appealing format, and so could be used with the share screen function in Zoom® to show participants the key points raised during the workshops. The platform also allowed for boards to be designed in advance of the workshops, which supported the planning of the co-design study. Both workshop 1 and 2 were audio and video recorded, with participants' permission, to allow the researcher to revisit breakout room activities and ensure key points and ideas had been captured on the Miro boards.

Workshop 1 – Idea generation

The focus of workshop 1 was broad idea generation, meaning activities and discussions were centred around identifying new ideas that would aid the implementation of safe and routine deprescribing in primary care. The schedule for workshop 1 can be seen in Table 21. Workshop 1 involved initial introductions by participants and an 'icebreaker' activity where each participant was asked which animal they related to and why. This icebreaker activity was chosen to allow the research team and participants to become acquainted and has been shown to engage research participants, whilst promoting beneficial research group dynamics (Kilanowski, 2012).

Participants were then briefed on the rationale for the co-design workshops. This focused on the increase in problematic polypharmacy, the lack of routine deprescribing in primary care, and a summary of findings from Chapters 4, 5 and 6 of this doctoral research. Space for a subsequent discussion was timetabled to allow participants to express how they felt after the research presentation and to allow for emotional mapping, highlighting touch points from the co-design participants. The concept of highlighting emotional touch points is utilised in EBCD, as described previously, to identify emotionally significant points in which service users encounter a service/intervention, to develop key co-design priorities to address (Girling et al., 2022, Fylan et al., 2021). This method was incorporated within this workshop to allow

participants to discuss their general views on polypharmacy, deprescribing, and the findings from the research to formulate priorities to aid the implementation of deprescribing to be discussed within the breakout room activity.

Participants were divided into two breakout rooms, ensuring a mix of patients, pharmacists, and GPs. The researcher (acting as a facilitator) was placed in a breakout room, whilst two PPIE facilitators were placed in the other breakout room. The PPIE facilitators were briefed on the nature of the breakout room activity. The breakout room activity involved participants discussing ideas of potential interventions or resources that can aid the implementation of routine deprescribing in primary care. Ideas and discussion points were captured on a pre-designed Miro sticky note board (Figure 8), which contained prompt points to encourage guided discussions. This was utilised to ensure discussions were focused on intervention and resources solutions to implementing deprescribing, rather than re-discussions on the problem of polypharmacy. The facilitators led the discussions, using the prompts to guide the discussion, and used the blank notes to capture discussion points and ideas. After this, participants were provided with a 10-minute break, and the remaining workshop time was used to recap the discussions and ideas generated within both breakout rooms.

Following workshop 1, the researcher reviewed the workshop 1 recordings to ensure ideas and discussions had been captured on the Miro boards. The researcher then met with the research supervision team to discuss the ideas generated in workshop 1 and to identify ideas to further explore in workshop 2. The ideas chosen were based on whether they would aid deprescribing implementation, and if it was feasible for the idea to be developed within the doctoral research, considering the remaining time and resources available. The completed workshop 1 Miro boards, summary of the discussions and the chosen ideas to further explore, were circulated with the co-design participants to set an agenda and aid preparation for workshop 2.

Table 21 – Co-design workshop 1 schedule

Session	Plan
Workshop 1	Introductions Presentation to introduce research (Study 1 & 2) and emotional mapping to highlight touch points from participants Setting goals and priorities for the workshops How workshops will work + ground rules Using the touch points generated, discuss resource ideas using the Miro post it note boards 13:00 – 13:10: Welcome + introductions (what animal do you relate as?) 13:10 – 13:30: Research presentation + space for discussion 13:30 – 13:35: Workshop 1 goals and ground rules 13:35 – 14:00: Breakout rooms – Miro Post-it note board 14:00 – 14:10: BREAK 14:10 – 14:25: Discuss breakout room activities 14:25 – 14:30: conclusion Summary of ideas and discussions to be collected and shared with participants between workshops. Feasible ideas will be shortlisted to be developed in workshop 2

Figure 8 – Pre-designed Miro Board for workshop 1

Workshop 2 – Idea development

Workshop 2 was focused on developing the ideas selected from workshop 1, which were developing prompts patients can use to initiate medicine necessity conversations, and how community pharmacists can act as a deprescribing safety net. Based on the discussions in workshop 1, medicine necessity conversations were described as conversations between patients and HCPs on the ongoing need for medicines. This encompassed discussing why the medicine had been prescribed and whether these reasons were still relevant to the patient, or whether the medicine could be stopped as an alternative. The schedule for workshop 2 can be seen in Table 22. The discussions and ideas of workshop 1 were summarised and the ideas to be developed were

presented to the participants. It was then explained that the emphasis of workshop 2 was to further develop these ideas to understand how they might function in real-life practice. To facilitate this, two breakout room activities were designed using pre-designed Miro storyboards. Participants were assigned the same breakout rooms as workshop 1.

The first activity, focused on identifying medicine necessity, featured four scenarios where a patient felt overwhelmed by their medicines and had an interaction with a GP, practice pharmacist, community pharmacist and a prescribing nurse to discuss medicine necessity. This board provided space for participants to add questions they felt patients could ask when encountering each of these four HCPs to initiate conversations on medicine necessity. There was also space on the board for participants to note what factors that would help patients feel confident to ask the identified questions, as well as any considerations needed for patients to be able to ask the identified questions. A copy of the pre-designed unpopulated board can be seen in Figure 9.

The second breakout room activity was focused on community pharmacists as a safety net to deprescribing. To facilitate this activity, a storyboard was designed that outlined the process of a medicine being deprescribed and provided possible points in which a community pharmacist could act as a safety net, based on the findings from the qualitative study 2. Participants were then able to provide more detail on how a deprescribing decision is communicated to a community pharmacy, how the pharmacist follows up with the patient, what the pharmacist might be able to do if a patient experiences adverse effects as a result of deprescribing, and how a pharmacist may feedback outcomes of deprescribing to improve the reflexive monitoring of deprescribing interventions. The latter point was incorporated due to the need for improved reflexive monitoring of deprescribing interventions to improve normalisation, as identified as a gap in the systematic review in study 1. A copy of this unpopulated storyboard can be seen in Figure 10.

After the second workshop activity participants from both breakout rooms reconvened. The researcher then summarised the discussion points from the activities, outlined the next steps for the research process, and thanked the participants for their time in the co-design workshops. At this stage, questions that patients could use to initiate conversations on medicine necessity had been identified, whilst an intervention of a community pharmacy deprescribing safety net had been outlined.

Table 22 – Co-design workshop 2 schedule

Session	Plan
Workshop 2	Recap from first meeting and the ideas taken forward Discuss how to improve patient confidence to stimulate conversations on the necessity of their medicines Produce questions patients can used to discuss medicine necessity Discuss how community pharmacists may act as a safety net and the type of information they might need to collect 13:00 – 13:05: Welcome + introductions 13:05 – 13:15: Recap last workshop + which ideas taken forward 13:15 – 13:20: Workshop 2 goals + ground rules 13:20 – 13:45: Breakout rooms – Miro storyboard – identifying medicine necessity 13:45 – 13:55: BREAK 13:55 – 14:20: Breakout rooms – Miro storyboard – community pharmacist safety net 14:20 – 14:30: Discuss main exercise + conclude and thanks

Figure 9 – Miro storyboard – identifying medicine necessity

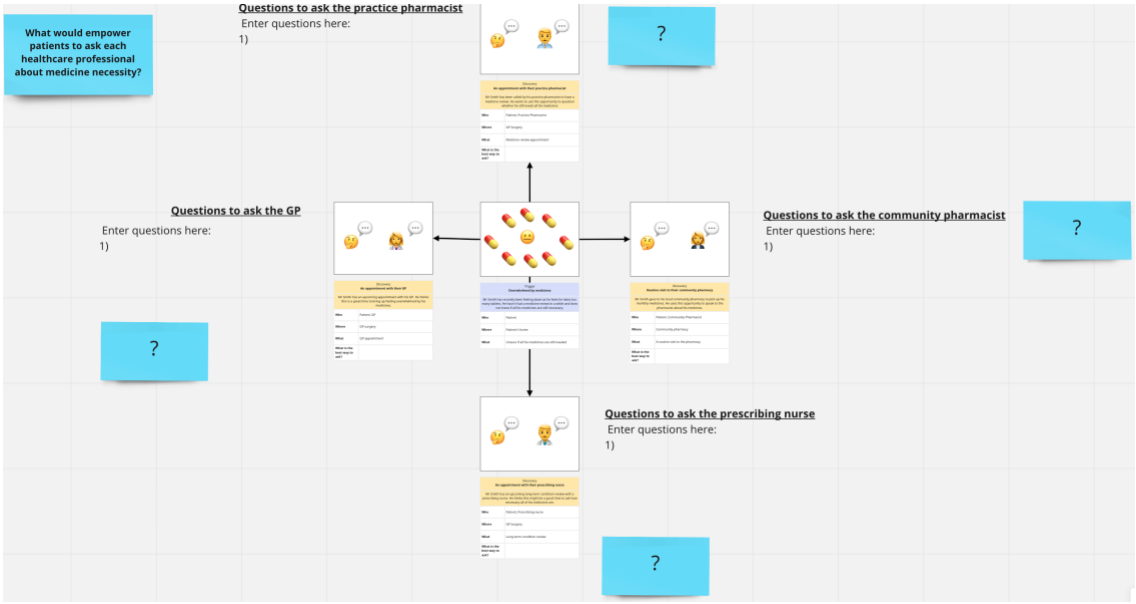
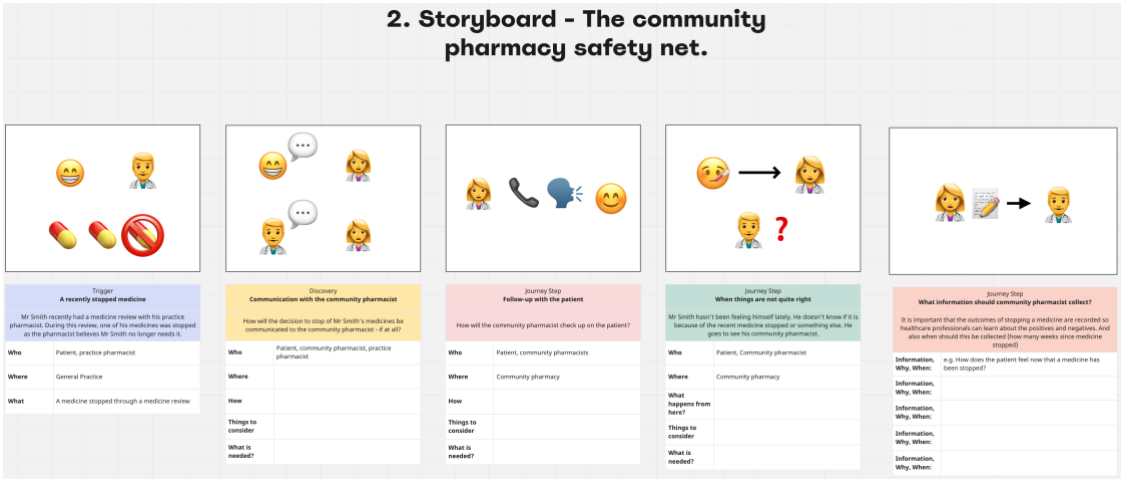


Figure 10 – Miro Storyboard – the community pharmacy safety net



7.2.6. Logic modelling

The idea of a community pharmacy deprescribing safety net intervention had been outlined as an output of workshop 2. However, how the intervention would operate, including its mechanisms and outcomes, would still require development and a form for representation for stakeholders. Subsequently, it was decided to produce a logic model to conceptualise this intervention. Logic models are visual models used to explain how an intervention produces outcomes and can support identifying process and outcome measures for intervention evaluation (Mills et al., 2019). The logic model would also be used to describe the intervention programme theory, which is a description of how the

intervention is expected to lead to its desired effects and the conditions needed to do so (Skivington et al., 2021).

Although multiple forms of logic model exist within healthcare research, a cited shortcoming is the lack of attention to the complexity of interventions through inattention to contextual factors, such as political pressures and levels of resourcing (Onyura et al., 2021). Context consideration is pivotal to implementation research as to understand the system in which an intervention can implemented and utilised effectively (Pfadenhauer et al., 2017). Thus, due to the implementation focus of this research, a logic model with consideration to contextual factors was chosen, which was The Real-World Logic Model (RWLM).

RWLMs express complex interventions within context in order to aid research in striking a balance between context-sensitivity and scalability (Mills et al., 2022). This variation of logic modelling was developed within the premise of complex intervention implementation in healthcare research, and so was deemed ideal to be utilised within this research. In this model, it allows for the identification and discussion concerning the macro-, meso- and micro- contextual factors, the implementation strategy, mechanisms of the intervention, and the predicted outcomes. The model also allows for the distinction between proximal and distal outcomes, where distal outcomes are hypothesised, measurable trial outcomes, and proximal are the expected short to medium term outcomes of the intervention. The core of the RWLM contains the mechanisms of the intervention that are needed to produce the identified outputs.

The first author of the publication introducing the RWLM was contacted to discuss how the community pharmacy deprescribing safety net could be translated into a RWLM model. This provided expert opinion on how to produce the RWLM as well as the opportunity to discuss incorporating elements of NPT within the logic model. As this was novel in nature, such advice was vital to understand the compatibilities between NPT and RWLM. Draft versions of the model were also shared and discussed to allow for expert feedback and revisions.

A RWLM was developed using the original RWLM template developed by Dr Mills et al., (Mills et al., 2022). The components of the RWLM identified as applicable to the intervention were the intervention context (macro, meso and micro), mechanisms, implementation strategy, and outcomes. The identification of these components was a result of analysis and interpretation of the research findings derived from the scoping review, systematic review, qualitative research, and co-design activities. These findings were critically evaluated and synthesised to determine their relevance and applicability

in constructing the model. Additionally, insights from discussions with the research supervision team and the consideration of external literature identified throughout the course of this doctoral research were instrumental in informing this process. NPT was employed as a theoretical framework to provide a conceptual underpinning for the implementation strategies and intervention mechanisms embedded within the RWLM. The utilisation of NPT facilitated a comprehensive understanding of the intervention activities by summarising them at a higher level, and contextualising implementation strategies within the framework of NPT constructs. This analytical process was carried out by the researcher, with valuable inputs and discussions from the research supervision team. Multiple iterations of the model were developed, and the supervision team and the first author of the RWLM provided feedback on how the model could be further improved. Finally, the model was developed with feedback incorporated including how and why each component was in the model.

7.2.7. PPIE involvement

PPIE input was necessary to ensure recruitment techniques and materials would be appropriate for potential workshop participants. Feedback was provided on recruitment posters and information sheets, and the appropriate language for the respective audiences. It was advised that the recruitment posters indicate that the researcher was taking expressions of interests (EOI) initially, so potential participants would understand that contacting the researcher would not automatically mean a place in the workshop. It would also allow the researcher to collect EOI before selecting co-design participants, so that a diverse group could be selected. It was also suggested that patient participants were compensated with money, whilst HCPs would be compensated with vouchers to avoid double payments. However, it was decided both patients and HCPs would be compensated with vouchers as this would be more manageable, and to indirectly express that the researcher viewed both participant groups as equal.

When designing the co-design workshops, PPIE advice was sought about how to encourage engagement by participants. It was advised that the time in between workshops should not be any longer than 3 weeks, to minimise loss of engagement by participants. As a result, the workshops were scheduled for 7th July 2022 and 28th July 2022 respectively. A PPIE member had originally discouraged the idea of having HCPs and patients within the same workshops, due to the risk of inhibiting patient participants. However, due to the researcher wanting discussions between HCPs and

patients, workshops were mixed but HCP titles remained anonymous and workshop facilitators were instructed to ensure all participants were able to contribute to discussions. As breakout room functions would be used for the workshops online, it was advised that the workshops we conducted via Zoom® due to its ability to pre-assign breakout rooms. In addition, as two representatives of PPIE were selected to be facilitators within the co-design workshop, it was important that meeting software was chosen that they felt comfortable using which was decided as Zoom®. Feedback was also provided on the research brief presentation to ensure the content was suitable and understandable for both healthcare professionals and patients.

After the first co-design workshop, further PPIE advice was sought on how to best plan for the subsequent workshop. It was suggested that a summary of the activities and discussions should be sent to all workshop participants, as well as the ideas to be further developed at second workshop with their respective justification. This would allow the participants to understand why the chosen ideas were selected as opposed to others and allow patients to prepare to focus only on the ideas chosen.

7.2.8. Patient feedback

Following workshop 2, patient feedback was sought on the questions developed to initiate conversations on medicine necessity. This was facilitated through sending an email containing the developed questions to the patient co-design participants, Safety in Numbers Group (SING) and the PPIE members that helped facilitate the workshops. It was decided to seek feedback solely from patient participants as they would be the intended target to use the developed questions. In the feedback email, patients were asked:

1. Do these questions make sense to you (Yes/No) Please describe reasons if not.
2. How would you change the wording of any of these questions, if at all?
3. Would you be comfortable asking these questions to healthcare professionals? (Yes/No). If not, any particular reasons why?
4. What, if anything, would prevent you from asking any of these questions?

These questions were decided on by the researcher, the supervision team and the PPIE facilitators.

7.3. Results

7.3.1. Participant characteristics

A total of five patients and five HCPs were recruited for the co-design workshops. Unfortunately, one HCP was unable to attend both workshops due to personal reasons, and so was not involved in the co-design process. Patient and HCP demographics can be seen in Table 23 and Table 24 respectively.

Table 23 – Co-design patient participant demographics

Patient	Age	Gender	Ethnicity
1	81	M	Bangladeshi
2	65	M	White British
3	65	F	White British
4	69	F	British Pakistani
5	65	F	British Pakistani

Table 24 – Co-design HCP participant demographics

HCP	Gender	Ethnicity	Job role
1	M	British Indian	PCN Pharmacist
2	F	White Scottish	GP
3	F	Asian Indian	Community Pharmacist
4	F	White British	GP

7.3.2. Output from co-design workshops

7.3.2.1. Workshop 1 output

The co-design activity in workshop 1 was the Miro sticky note board, where participants were able to note down their ideas on resources and interventions that would aid the implementation of routine deprescribing in primary care. The completed boards from both groups can be found in the appendices (Appendix Y). Within both boards, the black notes were used as discussion prompts.

Group 1 Miro board

Discussions within Group 1 commenced by exploring the communication strategies for deprescribing in patient care. Participants emphasised the need for clear and comprehensible language, ensuring consistent communication throughout the deprescribing process. A proposal emerged to raise patients' awareness about the potential for future deprescribing at the time of prescribing, distinguishing it from cost-saving measures and reinforcing that it is based on medicine safety considerations.

Subsequently, participants reached a consensus that periodic and personalised medication reviews serve as an appropriate platform for deprescribing. The importance of consistent review dates was emphasised to facilitate the review process, with a focus on ensuring patient understanding of medicine decisions and HCPs' understanding of the medicines impact on the patient's quality of life. During the discussion, patients expressed their concerns on the lack of regular medication reviews or having to initiate them themselves. Notably, instances of "paper reviews" conducted without patient involvement were identified by a HCP, highlighting the potential for misunderstanding and patient anxiety due to inconsistent review practices. Participants stressed the significance of patient understanding of deprescribing decisions to foster a sense of support throughout the process. While increasing the frequency of medication reviews could potentially facilitate deprescribing, it was acknowledged that resources may be underutilised due to nonattendance of appointments by some patients.

Another key aspect discussed was the necessity of dedicated time for deprescribing. The importance of a collaborative effort among healthcare professionals in general practice and primary care was highlighted to ensure the routine implementation of deprescribing. The involvement of community pharmacists in identifying suitable medicines for deprescribing during medication reviews was also suggested.

In terms of ensuring the safety of deprescribing, participants identified patient self-monitoring and the establishment of safety nets as effective measures. It was observed that some patients possess the confidence to contact HCPs if they experience adverse effects following deprescribing, leveraging their understanding of their own bodies, social situations, and usual quality of life to monitor the process. Additionally, patients' self-awareness of what they consider "normal" could serve as a catalyst for deprescribing conversations.

Participants further delved into factors influencing patient confidence in deprescribing. Trust in HCPs emerged as a key determinant, with higher levels of trust associated

with increased patient confidence in deprescribing. Participants recognised the need to address existing perceptions surrounding stopping medicines, as well as a "pill for every ill" culture among patients. Educating patients about the significance of deprescribing was identified as a strategic approach to tackle these challenges.

In conclusion, the final discussion focused on strategies to encourage HCPs to routinely consider deprescribing and enhance their confidence in the process. Participants suggested the development of HCPs' skills through deprescribing training to remind them to routinely evaluate the need for deprescribing in patient care.

Group 2 Miro Board

The co-design discussions centred on three prompts: 1. identifying factors that instil patient confidence during the deprescribing process, 2. determining effective modes of communication for decision-making and implementation of deprescribing, and 3. exploring strategies to ensure the safety and routine consideration of deprescribing by HCPs.

Regarding patient confidence, participants emphasised the importance of clear and consistent deprescribing communication. They highlighted the need for unambiguous information at the point of prescribing, specifically regarding medicine timelines and the potential for deprescribing. It was suggested that incorporating start and stop dates on prescriptions or patient records could facilitate routine deprescribing. The timing and nature of deprescribing communication were deemed crucial, with participants advocating for discussions face-to-face with doctors rather than relying on phone calls or other HCPs. Participants emphasised the significance of continuous, timely, and manageable deprescribing communication that includes explanations of medicine indications, benefits, risks, and shared decision-making. Recognising the role of pharmacists in providing information and addressing medicine-related queries, participants called for enhanced awareness of community pharmacists' skills and capabilities.

In the subsequent discussion, participants agreed that medication reviews, particularly when performed periodically and personalised, serve as an optimal platform for initiating deprescribing. However, they noted the need for sufficient time to conduct thorough in-depth reviews and proposed reviewing every prescription twice a year to identify potential deprescribing opportunities. Participants also highlighted the value of utilising changes in patient circumstances, such as receiving new prescriptions, as triggers for deprescribing conversations. Sharing global best practices in deprescribing

was seen as instrumental in promoting its routine consideration in healthcare. Concerns were raised about the lack of clarity regarding the responsibility for reviewing and deprescribing medicines. In response, some participants argued that deprescribing should be regarded as a prescribing decision and therefore a responsibility of every prescriber. To ensure newly qualified prescribers routinely consider deprescribing, the importance of deprescribing education for HCPs was underscored.

Patient participants expressed the need to know if their medicines were still necessary to actively participate in deprescribing. However, due to difficulties in obtaining appointments with HCPs, participants proposed alternative methods for promptly assessing medicine necessity without requiring GP visits. Developing a platform where patients can initiate conversations about stopping medicines and receive a call back from HCPs was suggested. Integrating such a platform within the existing digital healthcare infrastructure, such as the NHS app, was also considered. Additionally, participants discussed the potential benefits of providing patients with scripted lines or prompts to empower them to enquire about the necessity of their medicines without feeling confrontational. These prompts were envisioned as tools to facilitate conversations on medication necessity. Participants recognised patients as strong advocates for their own health and catalysts for deprescribing discussions. The discussions concluded by highlighting the importance of utilising various communication methods and adopting a national approach to deprescribing to avoid fragmentation and promote its routine implementation.

7.3.2.2. Workshop 2 output

After workshop 1 and subsequent discussions with the research supervision team, a consensus emerged regarding the ideas to be further developed. The selected ideas for development included the creation of patient script lines or prompts regarding medicine necessity and the intervention of community pharmacists as a deprescribing safety net. This consensus was driven by the recognition among co-design participants that patients play a vital role in advocating for their own health and can initiate deprescribing discussions. However, participants acknowledged that patients may lack awareness of their medicines' necessity and may hesitate to enquire about it, fearing that such enquiries could be seen as challenging HCPs. By assisting patients in initiating these conversations, it was anticipated that the frequency of deprescribing discussions would increase, particularly by highlighting instances when medications are no longer necessary. Consequently, this approach aimed to establish deprescribing

as a routine practice. The choice to further develop the intervention involving community pharmacists as a safety net was guided by the emphasis on safety expressed by co-design participants during workshop 1 and the findings of the qualitative research presented in Chapters 5 and 6, which aligned with the overall aims of this doctoral research.

Medicine necessity questions

Both groups used the pre-developed Miro board template (Figure 9) to guide the development of the medicine necessity questions. However, group 1 did not choose to populate their board due to time constraints but were still able to discuss the activity in-depth and provide input into the development of the questions. The researcher listened to group 1's discussion for this activity in verbatim, using the workshop recording, and supplemented this with discussions with the facilitators, to merge discussions from group 1 and 2 into a single Miro board (Appendix Z).

This activity was divided into two components. One component was a storyboard where a patient, who is struggling with polypharmacy, encounters a GP, a community pharmacist, a practice pharmacist, and a prescribing nurse within clinical situations patients would typically meet such HCPs. Participants were tasked with developing questions the patient could ask each HCP regarding the necessity of the medicines. Whilst participants were developing these conversations, it was highlighted that many of the questions developed for one HCP would also apply to others, and therefore were non-specific to HCP role. As a result, the participants were able to produce a list of questions the patients could ask about the necessity of their medicines, which was not specific to HCPs:

1. **Do I still need [medicine name]? Why am I on it still?**
2. **Are you the right person to ask if I still need all of these medicines? and is this the right time to talk about this?**
3. **Why am I taking this medicine?**
4. **I'm thinking of stopping this medicine, what would happen if I stop this now and in the long term?**
5. **Can I have a word with you about my medicines? - because I think I might not need all of these/I'm fed up with taking all these tablets**.

Consensus was achieved on the selection of questions through an in-depth discussion with the participants, wherein the appropriateness of all the questions suggested by participants and their inclusion were thoroughly evaluated. Only those questions that garnered collective agreement among the participants were ultimately included. Although these questions were not specific to HCPs, the participants did note that, for these conversations to be constructive with community pharmacists, a consultation room must be available to allow for privacy, and patients must understand that community pharmacist do not currently have access to full medical records, so there may be a limit to their input.

In addition, two additional questions were developed specifically for medication reviews. The reasons for this, as expressed by the participants, was to help patients set an agenda for medication reviews and bring any polypharmacy related issues or queries to the forefront of the review. HCP participants highlighted that this could help HCPs to identify when patients are struggling with polypharmacy and encourage deprescribing. These questions were:

1) **Do I still need [medicine name], why am I on it still? - to ask for each medicine on repeat prescription list.**
2) **I wonder if we can talk about things that worry me - I think I'm on too many medicines, I'm not sure if I need them all, could I stop something? - Patients can use this to set the agenda for a medication review – places focus on potential deprescribing**

The second component of this activity consisted of co-design participants discussing factors that may improve patient confidence to ask the identified questions. The core discussion point was that patients find it difficult to discuss medicine necessity when they do not completely understand their medicines. This was further exacerbated by ‘minor’ medicine changes that could confuse patients, leading to reluctance to discuss medicine necessity as they do not want to come across as “stupid” in front of HCPs. Subsequently, ideas of how to avoid this and help patients manage medicine changes were presented. This involved helping patients keep track of letters from different healthcare providers, especially when medicines had been prescribed or changed, and ensuring patients were copied into paper trails. A resulting idea was to help patients access their full GP medical records, including letters, through the NHS App. Another idea was to help patients understand who has initiated a medicine, which could be through adding these details on a repeat prescription or on prescription directions.

Participants highlighted that, for the questions to work, patients would also need assistance in knowing which HCPs they can go to ask about medicine necessity, and so more awareness is needed about this. The final discussion points were centred around helping patients understand medicine changes, including brands vs generic medicines, and dose adjustments that might not be typically seen in practice, i.e. if the dose is not in line with typical BNF doses.

Community Pharmacist Deprescribing safety net

The following activity involved co-design participants providing detail to the unpopulated community pharmacy deprescribing safety net storyboard (Figure 10). The purpose of this activity was for participants to develop how this intervention would operate in primary care, and any significant considerations. Both groups' storyboards can be found in the appendices (Appendix AA).

The initial stage of the deprescribing safety net involved the communication of a medicine being stopped to the community pharmacist. Group 2 deliberated on the potential methods for notifying the pharmacist, such as through direct contact from the general practice or updating the patient's prescription information. The need for improved communication between general practice and community pharmacy, possibly through digital interactions, was emphasised by both groups. Group 2 also stressed the importance of developing the relationship between community pharmacists and general practice to facilitate deprescribing communication.

The subsequent step in the safety net focused on the community pharmacist's follow-up with the patient whose medicine had been deprescribed. Group 1 discussed the content of this follow-up, including checking on the patient's wellbeing and symptoms. Factors such as the specific medicine deprescribed, patient-related considerations, and the feasibility of monitoring in the pharmacy setting influenced the nature of the follow-up. Group 2 highlighted the need for the pharmacist to enquire about the patient's preferred method of contact for follow-ups, either during medicine collection or through other established communication channels.

Regarding adverse reactions following deprescribing, Group 1 recognised the importance of understanding the cause of the patient's discomfort to address the situation effectively. Group 2 suggested empowering patients with self-monitoring strategies through education on expected post-deprescribing experiences and appropriate response measures. The involvement of other HCPs in general practice was also proposed to support the community pharmacist in the safety net, considering

their accessibility compared to GPs. Group 1 emphasised the need to inform patients about the role of community pharmacists in this capacity, as patients may not be aware of the services provided by community pharmacies and may unnecessarily burden their GP.

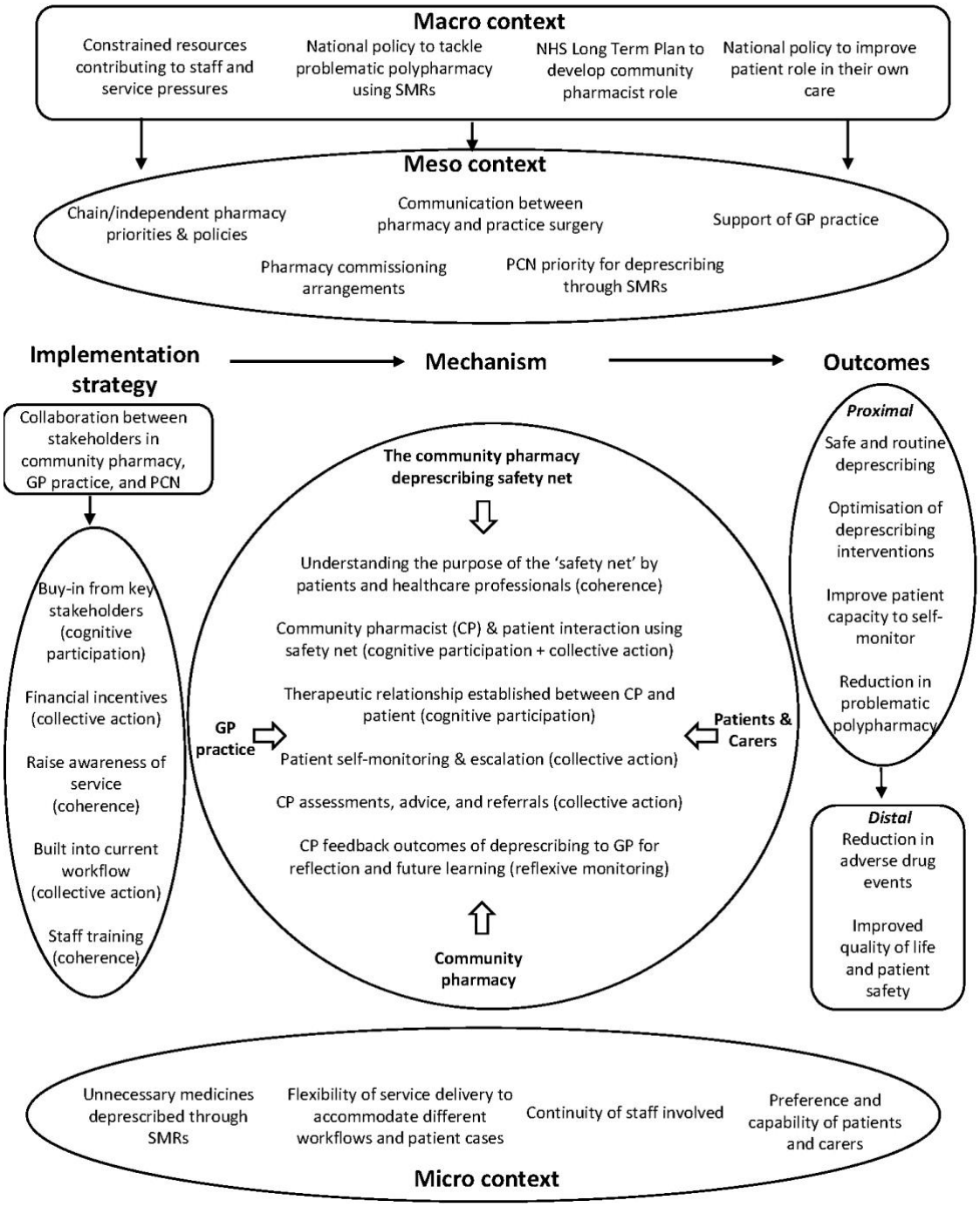
The final stage of the storyboard focused on the information that the community pharmacist would collect and provide feedback to the HCP who initiated the deprescribing. Group 2 identified several factors to be consistently evaluated during the follow-up process, including any negative experiences, successful aspects of deprescribing, safety alerts, and patient wellbeing. Group 1 discussed recording the specific medicine deprescribed, the duration of the process, ensuring confidentiality of collected information, and clarifying the use of such information.

7.3.3. Real-World Logic Model

7.3.3.1. Development of the Real-World Logic Model

Through co-design workshops with patients and HCPs, an intervention was formulated whereby community pharmacists act as a safety net to patients who have had a medicine deprescribed in primary care. This involved community pharmacists following up with patients who have stopped a medicine, the pharmacy being a destination if patients were worried about the effects of deprescribing, and for the community pharmacists to feedback deprescribing interventions to GP practices. The next stage was to develop the intervention into a RWLM to represent how the intervention mechanisms leads to the described outcomes, and the contexts needed for such outcomes to occur. The completed Community Pharmacy Deprescribing Safety net RWLM can be seen in Figure 11.

Figure 11 – The Community Pharmacy Deprescribing Safety Net RWLM



7.3.3.2. Components of the Real-World Logic Model

Macro context

The macro context was described as current broad policy and socioeconomic factors in which the intervention operates. This included constrained resources within current healthcare that has contributed to staff and service pressures, which has been well documented within literature (Ravalier et al., 2020). The 'no decision about me without me' policy was included because of its relevance in improving patients' roles within their own care and the emphasis on patients self-monitoring within the safety net intervention. It was also identified that there are literature and policies relating to developing community pharmacists into more clinical patient-facing roles, as well as tackling problematic polypharmacy through SMRs and subsequent deprescribing (NHS Long Term Plan), which would be relevant to the safety net intervention (NHS, 2019). Therefore, this was noted in the macro context which resulted in 4 main macro considerations in the RWLM.

Meso context

The meso context comprises the institutional and organisational factors required for the intervention to operate (Richter and Dragano, 2018). Community pharmacy policies and priorities, and PCN priorities for deprescribing through SMRs were included due to the emphasis of stakeholder buy-in to enhance implementation of deprescribing interventions, highlighted in Chapter 6 and in the construct of cognitive participation within NPT. This reasoning was also applicable to the consideration of support from GP practices, which was expressed within the co-design workshops. Finally, communication between pharmacy and GP practice, and pharmacy commissioning arrangements were included due to the emphasis of this contextual factor highlighted by co-design participants, and through interviews with HCPs (Chapter 6).

Micro context

The micro context comprises contextual factors required within an immediate environment for the intervention to produce the identified outcomes. It is essential that deprescribing interventions, facilitated through SMRs, are aligned with the overarching macro policies, transition smoothly through the established priorities in the meso context, and effectively manifest within the micro context. Hence, this element was incorporated into the model to emphasise its significance. There was also a consideration that there should be flexibility in service delivery to accommodate

different workflow and workloads to aid implementation, which was highlighted as a facilitator to deprescribing implementation in the systematic review in Chapter 4. Finally, the need for continuity of staff involved in the intervention, and considerations to the preference and capability of patients and careers involved in the safety net were identified from the patient interviews within Chapter 5 and within the co-design workshops.

Implementation strategy

The implementation strategy summarises approaches that would be utilised to aid the implementation of the intervention in primary care. In this section, the square box dictates a distal strategy, whilst the oval box dictates proximal strategies. Buy-in from stakeholders, financial incentives to use the intervention, raising awareness of the intervention, building the intervention into current HCP workflow, and required staff training were all identified as essential for such an intervention within the co-design workshops and qualitative studies (Chapters 5 & 6). A key distinction to highlight was that staff training referred to training needed to understand and deliver the safety net intervention (focusing on the process, systems, and resources), and the clinical training needed to understand deprescribing and its effects on patients. As these strategies were focused on implementation, they were attributed to constructs of NPT to explain the theoretical mechanisms, in which the strategies bolster implementation potential. Collaborations between community pharmacy, GP practice and PCN was selected as a distal implementation strategy due the emphasis on collaborative work which has consistently emerged in this doctoral research, and how it has been used as an implementation strategy for other community pharmacy interventions, such as the Discharge Medicine Service (NHS England, 2021).

Mechanisms

The central oval within the RWLM comprises the mechanisms of the intervention. Initially, the intervention activities derived from the co-design workshops were placed within the oval. These activities can be seen in Table 25.

Table 25 – Community Pharmacy Deprescribing Safety net activities

Activity	Activity description
1	Communication of deprescribed medicine from GP practice to community pharmacy
2	Community pharmacist contacts patient and introduces the 'safety net'. Explain the purpose and agree preferred patient communication method
3	Community pharmacist and patient to agree follow-up conversation
4	Reiterate to patient to contact/visit pharmacy if experiencing any issues
5	Community pharmacists to distinguish between minor ailments and withdrawal symptoms if symptoms occur – then to advise the patient or further refer onwards
6	Community pharmacist to collect and feedback information to GP after follow-up: A. Safety alerts that occurred B. Negative aspects experienced by the patient C. Things that went well during the process D. How the patient feels

On discussion with the RLWM expert, it became apparent that the model could be improved through converting the intervention activities into mechanisms. To do so, activities were summarised at a higher level, whilst drawing on the theory that underpinned the intervention, which was NPT. This resulted in the key mechanism of the intervention being derived from the intervention activities and the constructs of NPT to produce a specific mechanism of action of the intervention. The arrows from the GP practice, community pharmacy, and patients & carers pointed towards the mechanism emphasise the involvement of each stakeholder group within this intervention.

Outcomes

Similar to the implementation strategy, the intervention outcomes were separated to proximal (oval) and distal (square) outcomes. Safe and routine deprescribing was the goal of this doctoral research, and the intervention was designed with this as a primary outcome. The optimisation of deprescribing interventions through appraisals was one

significant gap in evidence needed to improve the implementation of deprescribing in primary care, as highlighted in the systematic review in Chapter 4, which has been theorised to be achieved through the feedback mechanism of the intervention. It was also theorised that the safety net intervention would aid reducing problematic polypharmacy through maintaining deprescribing safety, whilst the self-monitoring mechanism would improve patient capacity to self-monitoring, both being current national healthcare goals (NHS, 2019). A reduction in adverse drug events and improved patient QoL and safety are long-term outcomes of deprescribing identified in the literature and theorised to occur if deprescribing safety is maintained with the safety net intervention (Kutner et al., 2015).

7.3.4. Feedback on medicine necessity questions

Patient feedback was sought to evaluate the developed medicine necessity questions, aiming to gain early insights into the acceptability of the resource. Generally, patients demonstrated a comprehensive understanding of the questions and their purpose. Some minor grammatical modifications were suggested to align with the patients' preferred communication style, without compromising the core content of the questions. Notably, some patients expressed a preference for less direct and confrontational questions compared to others, emphasising the importance of providing a range of options for patients to choose from. Furthermore, the patients emphasised that their willingness to ask the developed questions would be influenced by the level of trust and the quality of the therapeutic relationship they had with their healthcare professional. This observation aligns with the findings from the patient interviews conducted in Chapter 5, highlighting the pivotal role of trust and the therapeutic relationship in patient engagement and communication. As a result, there were minimal changes to the questions presented in 7.3.2.2.

7.4. Discussion

The final co-design study described here used the findings of the research conducted in Chapters 2, 4, 5 and 6 to develop an intervention where community pharmacists act as a deprescribing safety net, and resources for patients to initiate conversations concerning medicine necessity. It is theorised that the intervention can benefit deprescribing safety through facilitating self-monitoring by patients post-deprescribing (as described in Chapter 5), and a follow-up system where pharmacists support patients through identifying potential adverse effects, providing advice, or referring patients to another HCP. The pharmacist feedback loop incorporated within the intervention allows for appraisal of deprescribing interventions, improving the reflexive monitoring of deprescribing which is needed to continually improve normalisation within practice (Okeowo et al., 2023, Murray et al., 2010). It is also hypothesised that the medicine necessity questions will help patients and HCPs identify medicines that are no longer essential for patients, subsequently leading to deprescribing.

7.4.1. Study outputs

7.4.1.1. Medicine necessity questions

In many instances, HCPs are unaware that patients are struggling with polypharmacy and so may not broach the idea of deprescribing, as highlighted in the co-design discussions. This is exacerbated in primary care by patients not being able to recall the reasons they take their medicines, especially if taken long-term (Doherty et al., 2020). The resultant effect leads to patients not knowing about the necessity of their medicines or the reasons they were prescribed, whilst HCPs assume the lack of voicing of concerns about polypharmacy means patients do not require a clinical intervention. This disconnect between patient and HCPs views on polypharmacy coupled with patients not knowing the necessity of their medicines culminates in appropriate interventions, such as deprescribing, not being adequately utilised in practice. It comes as no surprise that surveys exploring patient views on deprescribing, such as the Patients' Attitudes Towards Deprescribing (PATD) or the Patient Perceptions of Deprescribing (PPoD) tools specifically explore patient views of the necessity of their medicines (Reeve et al., 2013a, Linsky et al., 2017b). These difficulties were highlighted within the co-design workshops as areas of practice that need to be improved to enhance deprescribing implementation in primary care.

However, the co-design participants also emphasised that patients may not ask about their medicines' necessity in fear they are perceived as challenging HCPs. The power dynamic between patients and HCPs has been previously explored in literature where HCPs were traditionally seen as power holders, whilst patients were viewed lower in the power hierarchy (Nimmon and Stenfors-Hayes, 2016). This imbalance in power can inhibit patients from voicing their concerns or be active within their own care. This power imbalance should be minimised and patients encouraged to be involved in their own care as this has be shown to improve patient outcomes (Krist et al., 2017).

As a result, the medicine necessity questions co-designed with patients and healthcare professionals aim to empower patients to initiate conversations around the need for their medicines. By providing patients with suggested questions to use, it was believed this may encourage such conversations without patients being perceived as challenging. Subsequently, this can lead to deprescribing through routine assessment of medicine indications and identification of medicines no longer necessary for patients. The additional questions focused for medication reviews then allow for patients to voice concerns with polypharmacy and set an agenda for the reviews. By doing so, this can alert HCPs of the polypharmacy-related issues a patient may be facing and consequently look to address this through deprescribing. This also addresses the barrier that HCPs perceive patients do not want to stop their medicines, as discussed in Chapter 4. Overall, this portrays why it is theorised that the developed questions will aid the implementation of deprescribing in primary care, with particular focus on making this routine.

7.4.1.2. Community pharmacy deprescribing safety net logic model

As previously discussed in Chapter 1 the process of deprescribing carries risk, mainly around the risk of return of symptoms that the medicine was originally prescribed for and adverse withdrawal events (Reeve et al., 2018a). Therefore, when discussing the implementation of safe and routine deprescribing in primary care, it is paramount that a system to promote deprescribing safety is also established. If not, safety concerns resulting from deprescribing may impact, not only the therapeutic relationship between patients and HCPs, but the confidence patients and HCP require to routinely attempt deprescribing. Similarly, utilising pharmacists in deprescribing has been discussed within deprescribing literature, particularly because of the medicines expertise they can offer to the practice of deprescribing (Farrell et al., 2019). This is furthered by recent NHS healthcare policy promoting the use of community pharmacists in patient-facing

roles to efficiently utilise primary care resources to match growing healthcare demands (NHS, 2019).

The community pharmacy deprescribing safety net intervention incorporates these considerations through its use of community pharmacists to maintain the safety of deprescribing in primary care. By developing the Real-World Logic Model, this allowed for visual incorporation of current policies that the intervention operates within, as highlighted in the macro context. This allows stakeholders to understand the relevant active policies that influenced the development of the intervention. The identified meso and micro context then aid the understanding of what is needed between and within organisations to allow the intervention to function, which were identified during this research. The proximal implementation strategies, identified within the oval, then allowed the incorporation of implementation strategies that had been acknowledged in findings from Chapters 4, 5, 6 and 7. The intervention mechanisms, derived from NPT, allow for understanding of the significance of each aspect of the intervention in providing a safety net system for patients and the normalisation of the intervention through NPT. For example, through patients and HCPs understanding the purpose of the safety net, this improves the coherence of the intervention, enhancing its normalisation potential.

A key mechanism of the intervention is the feedback system allowing community pharmacists to feedback the effects and outcomes of deprescribing to the original deprescriber. This feature addresses the gap in knowledge in appraising deprescribing interventions which can bolster reflexive monitoring, and subsequently, the normalisation of deprescribing as identified in Chapter 4. This would facilitate patients and HCPs to learn from deprescribing experiences and the frequency, or lack thereof, of safety concerns which may mitigate barriers to routine deprescribing such as a fear of withdrawal effects, (Reeve et al., 2013b).

Within current healthcare, community pharmacists are increasingly involved in ensuring the effective, safe, and efficient use of medicines in primary care (Mossialos et al., 2015, Parekh et al., 2023). As a result, community pharmacists' involvement in safe deprescribing would be a logical extension of their role and further expand their medicines management responsibilities. Community pharmacists are already established in a similar safety system when patients start new medicines, known as the New Medicine Service (NMS). Since its conception in 2011, this service has seen a range of positive patient-based outcomes such as improved adherence to medicines (Stewart et al., 2020). Its implementation into routine practice saw the intervention incorporated into daily community pharmacist routines with minimal additional

resources and a lack of evidence of impacting other responsibilities (Latif et al., 2016). Due to the similar nature of the deprescribing safety net intervention to the NMS, as highlighted by patients and HCPs in Chapter 5 and 6, it is theorised that this intervention can be implemented into current healthcare without the need for significant additional resources and disruption to current community pharmacy responsibilities. However, payment systems, like that of the NMS, would need to be considered to drive intervention implementation.

7.4.2. Chapter summary

This chapter has described the co-design methods utilised to develop an intervention and resources focused on facilitating the safe and routine implementation of deprescribing in primary care. A Real-World Logic Model of a community pharmacy deprescribing safety net intervention, as well as medicine necessity questions for patients were developed through the doctoral research findings, PPIE input and co-designed with patients and healthcare professionals. Future work should investigate the feasibility of the intervention including resources to optimise its potential for use in practice, followed by an evaluation of its cost effectiveness.

Chapter 8 – Discussion and conclusion

8.1. Research question and summary of key findings

The increasing use of medicines, including potentially inappropriate medicines (PIMs), has emerged as a significant concern for various stakeholders, encompassing patients, healthcare professionals (HCPs), policy makers, and governments worldwide. Consequently, there has been a growing emphasis on deprescribing as a viable approach to combat PIM use, particularly within primary care settings. However, despite the potential of deprescribing to address PIM use, its implementation into routine clinical practice remains limited, thereby depriving many patients of the potential benefits while potentially compromising their safety. Moreover, ensuring the safety of deprescribing practices itself is crucial to mitigate any inadvertent adverse consequences. In response to these challenges, this doctoral research sought to investigate and establish strategies for implementing deprescribing in a safe and routine manner within primary care. As such, this research was guided by the research question “How can deprescribing be safely and routinely implemented within primary care?”. This research also incorporated the lens of implementation science, specifically drawing on the Normalisation Process Theory (NPT), to provide a theoretical understanding of how the normalisation of deprescribing can be achieved in the context of primary care.

8.1.1. Chapter 4 – Systematic review key findings

A substantial portion of the existing literature on deprescribing in primary care has primarily concentrated on the work needed to make deprescribing occur, primarily focusing on the deprescribing process itself. However, limited attention has been devoted to exploring the strategies for effectively and safely implement deprescribing into diverse care settings. Additionally, deprescribing studies have inadequately reported on the implementation of interventions, impeding efforts to replicate such interventions in clinical practice. To advance the understanding of deprescribing implementation and the normalisation of deprescribing practices within primary care, it is imperative to enhance the comprehension of how various stakeholders and groups appraise deprescribing interventions once they are introduced into practice. This analysis, falling within the purview of reflexive monitoring, should centre on examining

how individuals attempt to modify the newly implemented interventions, how groups assess the value of deprescribing, how individuals appraise the effects of deprescribing on themselves and their work environment, and how the benefits and challenges of deprescribing are identified and measured.

8.1.2. Chapter 5 – Patient interviews key findings

The involvement of patients in this research has revealed a significant finding regarding their acceptance and engagement in deprescribing. It became evident that for patients to fully embrace and participate in deprescribing, they required conviction regarding the rationale behind deprescribing and its appropriateness towards themselves. Consequently, patients placed great emphasis on the importance of the deprescribing rationale and the effective communication of this rationale. In this context, pharmacists were identified as a particularly valuable source of advice for patients when contemplating the deprescribing rationale. Regarding safety considerations, patients did not express a specific preference for the provider of deprescribing support. However, they did emphasise their eagerness to engage in self-monitoring following deprescribing. However, this desire came with certain conditions, such as being equipped with knowledge on when to seek medical attention and having the assurance that HCPs would be readily available if needed. Throughout the patient interview study, there was a general acceptance of pharmacist involvement in the deprescribing process, albeit with the caveat that the reasons for their involvement needed to be made clear. Furthermore, patients expressed a preference for the initial involvement of GPs in the deprescribing process before potential handovers to a pharmacist. Additionally, the development of a therapeutic relationship built on trust with the clinician and the maintenance of continuity of care during the deprescribing process were deemed imperative by patients.

8.1.3. Chapter 6 – Healthcare professional interview key findings

The HCPs participating in this research expressed a growing consensus on the benefits of deprescribing in primary care, although complete unanimity had not yet been achieved. They highlighted the prevailing culture within the current healthcare system that predominantly promotes medicine continuation while offering limited consideration for discontinuation. This culture was characterised by uncertainty and ambiguous risk, compounded by a lack of guidance on how to effectively implement deprescribing in practice. In response to these challenges, the HCPs stressed the

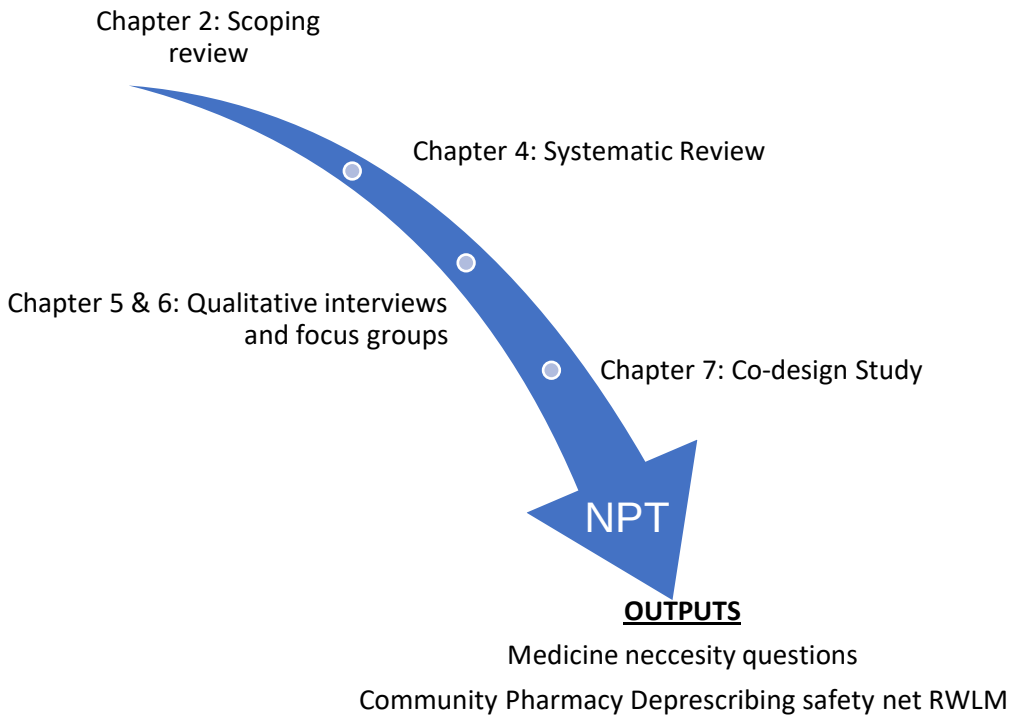
importance of the availability of deprescribing guidance and improved collaboration among HCPs in making clinical deprescribing decisions, thereby facilitating the integration of deprescribing into routine practice. To support the implementation of deprescribing, the HCPs emphasised the necessity of securing buy-in from stakeholders involved in any capacity with deprescribing. This encompassed training HCPs to incorporate deprescribing considerations from the moment of prescribing, as well as conducting patient information campaigns aimed at educating patients about the benefits of deprescribing and its appropriateness for their individual circumstances. In the context of maintaining deprescribing safety, HCPs stressed the significance of diligent patient follow-up to monitor for adverse effects and provide appropriate safety-netting measures to address patient concerns following deprescribing. Consequently, a deprescribing safety-net intervention emerged, wherein community pharmacists would serve as a point of contact for patients seeking guidance or expressing concerns after undergoing deprescribing. The accessibility of community pharmacies, along with the existing therapeutic relationships, were identified as advantageous factors supporting the viability of such an intervention. This intervention was likened to the current NHS New Medicine Service; however, it was crucial to establish the necessary infrastructure and provide adequate training to fulfil these roles effectively.

8.1.4. Chapter 7 – Co-design key findings

The final co-design study informed patients and healthcare professional on the research key findings and focused on developing interventions and/or resources to aid the implementation of safe and routine deprescribing in primary care. Through the co-design discussions, several important insights emerged. It was recognised that patients, as active participants in their own healthcare, could serve as catalysts for promoting routine deprescribing. However, it was also acknowledged that patients may feel hesitant to initiate discussions about the necessity of their medicines through fear of being perceived as challenging HCPs. Moreover, the discussions highlighted the valuable role that community pharmacists could play as a deprescribing safety net, providing support and feedback to both patients and the originating prescriber. Consequently, because of these empirical insights, the development of medicine necessity questions took shape. These questions were designed to empower patients to initiate conversations pertaining to the ongoing need for their medicines and the possibility of deprescribing. Additionally, a Real-World Logic Model (RWLM) depicting a community pharmacy deprescribing safety net intervention was formulated. This model illustrated how community pharmacists can effectively contribute to maintaining safety

throughout the deprescribing process, while also considering the contextual factors that influence the implementation and functioning of the intervention. This culmination of research, leading to the co-design of a resource and intervention, is hypothesised to contribute to the normalisation of safe and routine deprescribing in primary care. Furthermore, it suggests a viable strategy for ensuring deprescribing safety in practical healthcare settings.

Figure 12 – Summary of doctoral research, the interconnecting role of NPT and outputs



8.2. Key findings and their relationship with literature and policy

8.2.1. Implementing normalised deprescribing

8.2.1.1. Implementation considerations for deprescribing interventions

Since commencing this doctoral research, the field of deprescribing has experienced significant growth on a national and international scale. Notably, recent research endeavours have aligned with the objectives of this study by emphasising the implementation aspects of deprescribing interventions.

In this context, Wang et al., (2022) conducted a scoping review that investigated the implementation considerations of deprescribing interventions, with a specific focus on English-language publications targeting older adults (Wang et al., 2022). The following inclusion criteria were applied:

1. Clinical intervention trials.
2. Average age of patient sample ≥ 65 years old.
3. Study focused on deprescribing, defined as discontinuation or titration of one or more medicines.

It is noteworthy that this review did not focus itself to a particular healthcare setting or geographic region, in contrast to the primary care focus of this doctoral research in the UK. A total of 37 studies were included in the review. Within these studies, a total of 35 deprescribing interventions were identified, with prescribers and pharmacists emerging as the most involved HCPs in these interventions (Wang et al., 2022).

In terms of enhancing the implementation potential of deprescribing interventions, the review identified three significant considerations: the availability of resources within existing healthcare systems; the target patient population; the design aspects of the interventions, including their content, intensity, and duration (Wang et al., 2022). Wang et al., (2022) highlighted that the variation in healthcare providers and resources across different clinical settings and regions had a notable impact on how deprescribing evidence was translated into practice. Specifically, countries at the forefront of deprescribing research, such as the UK, Canada, and Australia, experienced certain advantages due to the presence of community pharmacists, who were readily available and had established reimbursement structures that could be leveraged to support clinical services such as medication reviews and deprescribing efforts. However, in countries such as the United States, where community pharmacy services are more limited and not covered by federal healthcare insurances accessible to older adults, the implementation of deprescribing within such healthcare systems may face limitations (Wang et al., 2022). These findings align with the support for utilising community pharmacists in deprescribing within the research presented in this thesis. Patients in this study expressed positive experiences and interactions with community pharmacists, particularly appreciating their accessibility without the need for appointments which was emphasised during the pandemic. Similarly, HCPs also acknowledged the convenience and the presence of established therapeutic relationships between community pharmacists and patients, which could be harnessed to facilitate deprescribing implementation. Although community pharmacists do not yet have a defined role in deprescribing, their presence within the UK healthcare system,

where they have existing payment structures for clinical services like the New Medicine Service, offers a potential avenue for deprescribing implementation when compared to countries lacking this resource. However, this doctoral research also uncovered barriers to the involvement of community pharmacists in deprescribing, such as their limited access to complete medical records. Thus, while an opportunity exists, further work is necessary to fully understand how to optimise the impact of community pharmacists in the context of deprescribing.

The second implementation consideration, namely target patient populations, revealed the heterogeneity observed across intervention studies in terms of the specific patient populations targeted. The authors highlighted those countries with robust home-care support systems, such as nursing homes, tend to have patient populations characterised by increased frailty, advanced age, and greater functional impairments. Within such countries, deprescribing interventions may yield more pronounced effects, as the review suggested that interventions are likely to be most efficacious when tailored to patients exhibiting high levels of frailty, co-morbidity, and extensive polypharmacy (Wang et al., 2022). While deprescribing in nursing homes lies outside the scope of the present research, multiple studies within the deprescribing literature have advocated for the necessity, advantages, and processes associated with deprescribing in long-term care settings (Holland et al., 2023, Alves et al., 2019, Baqir et al., 2017).

The third crucial implementation consideration pertains to the design of deprescribing interventions. The scoping review identified various components comprising deprescribing interventions, including educational interventions, medication reviews, assessment of target medicines for deprescribing, and communication among HCPs and/or between HCPs and patients (Wang et al., 2022). However, the review found that only a minority of studies incorporated implementation outcomes such as the feasibility and acceptability of deprescribing, the time required for deprescribing tasks, and the challenges encountered during implementation. Moreover, several studies emphasised the significance of post-deprescribing monitoring to ensure patient safety and adherence to the intervention, suggesting that follow-up interventions may enhance the effectiveness and sustainability of deprescribing. Despite these observations, most interventions were delivered as one-time events, lacking subsequent assessments of adherence or safety outcomes (Wang et al., 2022). This lack of implementation reporting in deprescribing studies aligns with the findings of the systematic review conducted in Chapter 4, underscoring how this knowledge gap hampers the reproducibility of deprescribing interventions in clinical practice.

Additionally, interviews with HCPs conducted in Chapter 6 revealed the crucial role of follow-up interventions in ensuring deprescribing safety. These findings shed light on two essential elements of deprescribing interventions – implementation strategies/reporting and follow-up procedures – that hold significant implications for translating deprescribing research into safe and routine clinical practice. However, these aspects are often overlooked in deprescribing literature, leaving a critical knowledge gap that necessitates attention to enhance deprescribing implementation in primary care. While this doctoral research addresses some of these aspects, further advancements in deprescribing research are warranted to enhance understanding in this domain.

The scoping review conducted by Wang et al., concluded by highlighting the limited and uncertain implementation potential of deprescribing interventions in clinical practice. The authors also noted a lack of involvement of multidisciplinary HCPs in deprescribing trials. Based on their findings, the authors made several recommendations to facilitate the implementation of deprescribing into routine practice. These recommendations included improvements to the interoperability of electronic health records to enhance communication between HCPs and support deprescribing efforts. Furthermore, the authors emphasised the importance of interdisciplinary collaboration to broaden the impact of deprescribing across various healthcare disciplines (Wang et al., 2022). Although Wang et al.'s review encompassed deprescribing in different healthcare settings, there are noteworthy similarities in its findings when compared to the focus of the research presented in this thesis on deprescribing in primary care.

Despite the existing gap in the literature concerning the implementation of deprescribing specifically within UK primary care, there has been a growing research focus on implementation considerations in other healthcare settings, including UK hospitals, indicating a shift in momentum (Scott et al., 2019). Moreover, recent deprescribing studies have demonstrated an enhanced recognition of the importance of implementation considerations, employing implementation theories such as NPT to facilitate a more comprehensive understanding of the implementation process.

The Supporting Prescribing in Older Adults with Multimorbidity in Irish Primary Care (SPPiRE) trial aimed to assess the impact of a GP-delivered medication review on reducing polypharmacy and potentially inappropriate prescribing (PIP) in community-dwelling older patients with multimorbidity in primary care (McCarthy et al., 2022a). This pragmatic, 2-arm cluster RCT employed GP clusters as the unit of intervention delivery, while patient-level outcomes were analysed. The intervention involved training

videos demonstrating the SPPiRE medication review process, along with an online medication review template offering a structured approach and links to alternative strategies for identified PIP. The intervention provided guidance to GPs on various aspects, including screening prescriptions for PIPs, assessing patient treatment priorities and wellbeing, reviewing each medicine with the patient, engaging in shared decision-making, and providing patients with a summary of the review and any medicine changes. The study spanned 6 to 12 months, with the control arm delivering usual care during the study period (McCarthy et al., 2017).

Interestingly, the provision of deprescribing guidance and a structured process for deprescribing, as reflected in the SPPiRE intervention, resonated with the sentiments expressed by HCPs in this doctoral research, emphasising the potential benefits of such guidance in facilitating routine deprescribing in primary care. However, the guidance discussed by HCPs in this doctoral research extended beyond the medication review itself to encompass the broader deprescribing process including monitoring. Within the SPPiRE trial, eligible GP practices included those with at least 300 registered patients aged ≥65 years utilising specific Irish GP practice management systems that enabled the use of a SPPiRE patient finder tool. Eligible patients were aged ≥65 years and prescribed ≥15 repeat medicines i.e., hyperpolypharmacy. The primary outcomes assessed in the study were the number of repeat medicines and the proportion of patients with any PIP (McCarthy et al., 2022a).

The trial recruited a total of 51 practices and 404 patients. The mean age of the patients was 76.5 years (SD 6.83), with a mean number of medicines of 17.37 (SD 3.50), and a mean number of PIPs per person of 2.52 (SD 1.48) (McCarthy et al., 2022a). The study found a reduction in the number of medicines and PIP in both the intervention and control group at follow-up. Furthermore, there was no evidence of an effect on the adjusted odds ratio of having a PIP in the intervention group compared to the control group at follow-up (OR 0.39, 95% CI: 0.140 to 1.064, p = 0.066). However, there was a small but significantly greater reduction in the number of medicines and a significant reduction in the odds of being prescribed ≥15 medicines in the intervention compared to the control group (McCarthy et al., 2022a). These findings align with those of several deprescribing RCTs investigating deprescribing in older adult populations across various settings, which have reported a reduction in the number of medicines taken but have yielded uncertain patient-related outcomes (Omuya et al., 2023).

Although the impact of the intervention remained unclear, the study authors emphasised the importance of implementing the intervention consistently, every 6 to 12 months, as opposed to the one-off intervention seen within the study. They suggested

that such implementation could potentially lead to improved patient outcomes and behavioural changes among prescribers (McCarthy et al., 2022a). This sentiment echoes the findings of this doctoral research, which discovered that HCPs expressed a need for deprescribing guidance and desired a structured approach to deprescribing to facilitate its routine practice in primary care. The provision of deprescribing training and guidance on addressing clinical deprescribing scenarios, like the SPPiRE intervention, may not only reduce the number of medicines taken, as observed in the study, but also promote the routine practice of deprescribing in primary care, particularly during medication reviews.

Furthermore, attention should be directed towards the process evaluation of the SPPiRE trial, which has yet to be completed. The study protocol for the process evaluation outlines plans to assess how the implementation of the intervention may occur on a wider scale in primary care, utilising implementation science alongside qualitative interviews with GPs. The analysis of the data will be informed by NPT, similar to the utilisation of NPT in this doctoral research (Kyne et al., 2020). Although the specific way in which NPT will be used in this process evaluation has yet to be seen, the inclusion of NPT signifies a positive step towards a heightened focus on successfully implementing and replicating deprescribing interventions within clinical practice. In line with the findings of the systematic review highlighting the scarcity of deprescribing implementation research in Chapter 4, the research presented in this thesis advocates for the inclusion of such literature to enhance our understanding in this area.

8.2.1.2. Leveraging NPT for normalised deprescribing

The use of NPT in this doctoral research holds significant value, providing a theoretical framework for examining the implementation perspective of deprescribing in primary care. Its application in the systematic review investigating the barriers and facilitators to proactive deprescribing implementation in primary care shed light on the current state of deprescribing knowledge by revealing a predominant focus on the collective action aspect of deprescribing (i.e., the deprescribing process), while highlighting a notable scarcity of knowledge pertaining to reflexive monitoring of deprescribing. Over the past decade, research efforts have predominantly centred around understanding the deprescribing process itself rather than the required actions to facilitate its implementation (Reeve et al., 2014b, Silcock et al., 2023). Consequently, it is not surprising that the deprescribing literature is saturated with evidence pertaining to the

collective action involved in deprescribing. This understanding, as elucidated through the lens of NPT, is crucial for improving the normalisation of deprescribing interventions within healthcare practices. However, it is equally important to enhance understanding of the other constructs of NPT, namely coherence, cognitive participation, and reflexive monitoring.

Currently, there remains a notable scarcity of deprescribing appraisal within deprescribing interventions, along with an absence of guidance on conducting comprehensive appraisals of such interventions. Employing the EBCD approach, Silcock et al., (2022) collaboratively designed a deprescribing pathway tailored for older adults with frailty in the UK. Notably, this pathway incorporated patients' expressed desire to provide feedback to HCPs, thereby becoming an integral component of the deprescribing process (Silcock et al., 2023). While this development presents a potential avenue for the incorporation of reflexive monitoring into the deprescribing pathway through HCP evaluation, uncertainties persist concerning the practical utilisation of such feedback to fortify reflexive monitoring and facilitate subsequent normalisation of deprescribing interventions. Deprescribing literature also lacks sufficient discourse on strategies for enhancing reflexive monitoring to facilitate the implementation of interventions within healthcare settings. Nonetheless, valuable insights can be gained from studies conducted in diverse healthcare contexts that have sought to implement complex interventions by leveraging the theoretical framework of NPT.

An example of leveraging NPT in the implementation of a complex intervention can be found in the work of Johnson et al., (2017). They conducted a prospective before-and-after intervention study in a tertiary neonatal intensive care unit (NICU) with the goal of implementing an evidence-based nutritional guideline to enhance the nutritional care of preterm infants in the south of England (Johnson et al., 2017). To enhance the implementation success of the intervention, targeted strategies were employed to address specific constructs of NPT. The study utilised a questionnaire based on the NPT online toolkit to assess the normalisation of guideline compliance during the study period. The questionnaire asked participants in the study group to anonymously rate their level of agreement with NPT-related questions, generating an aggregate score for each of the four NPT constructs. These scores were visually represented using radar plots, which revealed that over time, participants began perceiving the intervention as a normal part of their practice. However, certain aspects of implementation still exhibited room for improvement. Specifically, scores related to collective action and reflexive monitoring were initially lower, indicating that staff members did not fully recognise the

benefits of the intervention in their work. To address this, researchers disseminated the ongoing study results to NICU staff, which subsequently led to improvements in the corresponding NPT scores. The study further observed that guideline compliance and NPT scores increased progressively during the implementation phase, reaching a plateau in the post-implementation phase. The authors emphasised the significant role of reflexive monitoring by staff members in assessing implementation progress, through appraising the benefits of the intervention, as it was strongly associated with intervention compliance. Overall, the study demonstrated enhanced infant nutrition and rapid integration of the intervention into practice facilitated by the application of NPT (Johnson et al., 2017).

While acknowledging the contextual variations in clinical settings, the example above accentuates the significance of reflexive monitoring and how it was successfully augmented through the dissemination of intervention appraisal among staff members. Similar strategies could be implemented within the realm of HCPs involved in deprescribing, not only to highlight the potential positive impact on patients, but also to identify the absence of associated harms. Interestingly, HCPs expressed a similar viewpoint regarding deprescribing implementation in primary care in Chapter 6. Some HCPs reported that witnessing the effects of deprescribing and the absence of safety concerns bolstered their confidence to routinely engage in deprescribing practices. Consequently, providing feedback on deprescribing outcomes to the original prescriber may enhance the reflexive monitoring of deprescribing and further embed the intervention into routine practice. This highlights a critical aspect of the community pharmacy safety net, namely the incorporation of a feedback loop wherein community pharmacists can relay the outcomes of deprescribing to the original prescriber or the deprescribing initiator. This enhancement could be further augmented by integrating patient feedback for HCPs via community pharmacists engaging in discussions or administering surveys focused on patient satisfaction, as exemplified in the conceptualisation of the 'ideal' deprescribing pathway by Silcock et al. (Silcock et al., 2023). Theoretically, such an approach could yield a similar effect as observed in the study conducted by Johnson et al., (2017), wherein intervention appraisal, particularly the understanding and appreciation of intervention benefits, facilitated the normalisation of a complex healthcare intervention.

The integration of the feedback loop within the community pharmacy deprescribing safety net exemplifies the influence of NPT in identifying strategies for normalising deprescribing in clinical practice. However, it is important to recognise how the co-

designed medicine necessity questions also address key constructs within the NPT framework.

During patient interviews conducted in Chapter 5, the exploration of factors contributing to patient confidence in deprescribing aligns with the construct of collective action in NPT. Patients expressed the need to be sufficiently convinced of the deprescribing rationale, which revolves around discontinuing unnecessary medicines to improve patient safety and outcomes. Therefore, highlighting when medicines are no longer needed becomes crucial in fostering patient conviction towards deprescribing. Moreover, while the interview question aimed to assess patient confidence in deprescribing which is derived from the construct of collective action, the response of being convinced by the deprescribing rationale relates to the construct of 'sense-making' or coherence within NPT. Specifically, it corresponds to the subconstruct of internalisation, wherein individuals understand the value, benefits, and significance of deprescribing. Therefore, when patients engage in discussions and are convinced of the necessity for deprescribing, it not only enhances their confidence and collective action in the intervention but also contributes to the development of coherence surrounding deprescribing. By leveraging two constructs of NPT, there is a theoretical enhancement in the normalisation potential of deprescribing in primary care settings. Patients' understanding and conviction regarding the necessity of their medicines and subsequent deprescribing rationale play a crucial role in fostering confidence, collective, and coherence with deprescribing interventions.

However, effectively convincing patients about the rationale behind deprescribing remains complex. This complexity primarily arises from the inherent uncertainties surrounding the deprescribing evidence base, compounded by the challenges in quantifying and effectively communicating the risks and benefits linked to deprescribing, as discussed in Chapter 6. Moreover, this complexity is further compounded by the need to factor in individual patient preferences, values, and treatment objectives, which can substantially diverge across patients. Consequently, a more extensive inquiry is warranted to delve into how HCPs can be better equipped to adeptly convey compelling deprescribing rationales to patients, accounting for the nuances surrounding the deprescribing process.

8.2.2. Patients as a catalyst for routine deprescribing

8.2.2.1. Patient communication in deprescribing

In the UK, the average duration of GP appointments is 9.2 minutes, falling short of the minimum recommended duration of 15 minutes by the Royal College of General Practitioners (Irving et al., 2017, Royal College of General Practitioners, 2019). Given the increasing complexity of the patient population due to the rising prevalence of age-related diseases, coupled with the already identified time constraints as a barrier to deprescribing for GPs, it is understandable that deprescribing may not always be at the forefront of their considerations during patient encounters (Doherty et al., 2020). Considering these challenges, empowering patients to initiate conversations about deprescribing may offer a potential solution in the form of deprescribing reminders. Patients can serve as reminders or catalysts for deprescribing considerations, effectively providing an avenue for deprescribing discussions within the limited appointment time (Chan et al., 2023). By taking an active role in these conversations, patients can play a proactive role in advocating for their medication management and prompting deprescribing discussions with their healthcare providers.

There has been an increased focus on the use of communication tools to facilitate deprescribing. Chan et al., (2023) recently conducted a scoping review aiming to identify and categorise existing deprescribing communication tools for HCPs and patients. Articles were included if they contained a deprescribing tool or intervention with a patient communication component and were excluded if they were not available in English or were published before 2000 (Chan et al., 2023). A total of 32 resources were included which contained 40 tools with a patient communication component (Chan et al., 2023).

The review identified deprescribing communication tools originating from the UK, United States, Australia, and Canada. Among the identified tools, the majority (60%) were designed for use in primary care settings, with a specific focus on community-dwelling adults aged ≥ 65 years accounting for the most common target population (37.5%). Notably, almost half of the identified tools offered general support for deprescribing without prescribing specific medications for discontinuation. Moreover, a significant proportion of the tools lacked testing or validation, raising concerns about their reliability and efficacy. Further examination of the tool components revealed that the majority aimed to enhance deprescribing awareness, improve health literacy, and foster patient self-efficacy (Chan et al., 2023).

The tools designed for patients primarily aimed to educate them on the risks and benefits associated with medicines, as well as providing guidance on initiating conversations about deprescribing. Similar to the developed medicine necessity questions, many of these tools encouraged patients to engage in discussions with HCPs regarding their medicines, offering suggested phrasing and conversation starters that were perceived to facilitate deprescribing (Chan et al., 2023). However, the process through which some of these tools were developed, as well as the involvement of patients and HCPs in their creation, remained unclear. Notably, none of the identified tools containing patient-initiated deprescribing questions originated from the UK, underscoring the novelty of the co-designed medicine necessity questions within the UK context. The authors concluded by emphasising the potential of such communication tools in increasing the frequency of deprescribing, while also highlighting the need for validation and research into their effectiveness (Chan et al., 2023). Despite the novelty of the developed medicine necessity questions, the recommendations regarding validation and effectiveness research remain applicable. Validated tools that have demonstrated effectiveness and feasibility in primary care settings are crucial. Therefore, conducting feasibility testing and further refining the medicine necessity questions would be beneficial in transforming this resource into an effective tool for patients, enhancing their understanding of medicine necessity, and identifying opportunities for deprescribing.

8.2.2.2. Enhancing patient involvement in their own care

The development of medicine necessity questions reflects the alignment with current NHS policy, which aims to empower patients to actively participate in their own care. Extensive evidence has demonstrated that patients who are involved in their care achieve improved treatment outcomes compared to those who have limited involvement (Darkins et al., 2015, Krist et al., 2017). As a result, healthcare models have increasingly focused on enhancing patient involvement and providing patient-centred care, while also striving to minimise the traditional medical hierarchy in which HCPs make decisions on behalf of patients. In line with this approach, the UK government released the policy document "Liberating the NHS: No decision about me, without me" in 2011, which emphasised the importance of shared decision-making between patients and HCPs to enhance healthcare delivery nationwide (Department of Health and Social Care, 2011). Subsequently, there has been a heightened emphasis on finding ways to effectively engage patients in their care.

The NHS Long Term Plan further reinforces this commitment by seeking to enhance support for patients to manage their own health and actively participate in decision-making processes (NHS, 2019). The National Institute for Health and Care Excellence (NICE) has also provided guidance on implementing shared decision-making in all healthcare settings (The National Institute for Health and Care Excellence, 2021). Within this guidance, it highlights the importance of supporting patients to ask questions regarding their care, particularly using prompts. Patients may hesitate to ask questions to HCPs due to perceiving them as decision-makers, hence providing support to patients in this regard can facilitate shared decision-making (Katz et al., 2007).

The medicine necessity questions developed in this doctoral research are built on this premise, encouraging patients to enquire about the necessity of medicines they may not be aware of. These questions promote patient engagement in their own care, serve as a foundation for shared decision-making, and serve as a reminder to HCPs to consider the ongoing need for and potential deprescribing of unnecessary medicines. Given that patients in this research expressed a willingness and right to be involved in deprescribing decisions, the growing body of literature highlighting the importance of shared decision-making in deprescribing, and the healthcare system's adaptation to encourage and support patient engagement in their own care, the medicine necessity questions have the potential to act as catalysts for routine deprescribing in primary care.

8.2.3. The role of pharmacists in safe and routine deprescribing

8.2.3.1. PCN and primary care pharmacists

The inclusion of pharmacists in this research aimed to understand their perspectives on deprescribing, which was generally welcomed. Chapters 1 and 2 of this research have emphasised the active involvement of pharmacists in deprescribing interventions, which has demonstrated positive outcomes in terms of deprescribing effectiveness (Martin et al., 2018). Chapter 1 introduced the heightened emphasis on deprescribing and SMRs because of significant policy developments, namely the NHS Long Term Plan, the Network Contract Directed Enhanced Service centred on Structured Medication Reviews (SMRs), and the overprescribing report advocating for the integration of deprescribing into routine healthcare practices. These policy documents announced increased funding to support the deployment of clinical pharmacists within primary care settings, enabling the provision of medication optimisation services.

Moreover, the expansion of SMR services has been advocated, with the aim of extending their benefits to a broader spectrum of patients (NHS, 2019, Department of Health and Social Care, 2021). Building upon this foundation, Chapters 5 and 6 explored the specific role of pharmacists in deprescribing. However, it should be noted that research efforts and government initiatives have continued to evolve in this area.

The transformative impact of the Network Contract Directed Enhanced Service on the landscape of primary care deprescribing was elucidated in Chapter 6. Notably, primary care staff acknowledged the pivotal role of clinical pharmacists within PCNs and general practices in driving deprescribing efforts through SMRs. This contractual arrangement clearly mandated that primary care pharmacists actively engage in deprescribing as part of the SMR process. However, it is imperative to assess the preparedness of pharmacists for deprescribing and ascertain the extent to which SMRs have been consistently implemented since their introduction. During interviews with primary care pharmacists, various factors hindering deprescribing were identified, influencing the likelihood of deprescribing.

Additionally, questions were raised about whether pharmacists had enough time to conduct SMRs and investigate deprescribing options. Furthermore, it is impossible to ignore the COVID-19 pandemic's considerable influence on SMR adoption. The implementation of SMRs may have undergone alterations as healthcare systems were forced to adapt to deal with the pandemic's requirements, with only a recent return to normalcy being seen in this regard.

A recent qualitative study by Madden et al., (2022) examined the early implementation of SMRs in the UK context and explored the factors influencing the initial rollout of SMRs through semi-structured interviews with two groups of participants: ten newly appointed pharmacists in PCNs in Northern England and ten pharmacists with established positions in GP practices across 10 PCNs throughout England (Madden et al., 2022). All the pharmacists in the study conducted SMRs remotely via telephone. Including newly appointed and experienced pharmacists allowed for a comprehensive understanding of perspectives, encompassing those who had recently joined the PCN in response to the NHS funding initiatives for clinical pharmacists in primary care.

Findings revealed that the implementation of SMRs had yet to emerge as a priority within PCNs, with individual pharmacists shouldering the responsibility for initiating the service within their respective PCNs. Experienced pharmacists highlighted that conducting SMRs was more time-consuming and challenging due to the intensive patient focus and complexity involved. One senior pharmacist expressed confusion

regarding the association of SMRs with the newly funded clinical pharmacist workforce, who might need more experience in conducting clinical reviews. Several newly appointed PCN pharmacists expressed concerns about their clinical knowledge and sought resources, such as templates, to structure their SMR discussions, mainly if they lacked previous patient-facing experience. Interestingly, pharmacists conducted medication reviews via telephone without prior notice to patients, which, while not ideal, was considered a practical approach. The study revealed a need for more alignment between SMR implementation and the ideal patient-centred practices outlined in policy documents. Instead, SMR practices tended to revert to conventional medication review procedures, undermining the specific purpose of the service (Madden et al., 2022).

The establishment of a role for primary care pharmacists in deprescribing (within the context of SMR) introduces opportunities for deprescribing in primary care. However, despite this development, the readiness of pharmacists to engage in deprescribing practices is limited. The data from interviews with HCPs in Chapter 6, as well as the early SMR implementation study conducted by Madden et al. (2022), emphasise the need for support and resources to enhance the routine consideration of deprescribing among pharmacists. This doctoral research contributes to this perspective by identifying barriers faced by primary care pharmacists in relation to deprescribing, especially considering the introduction of SMRs.

Nonetheless, further efforts are required to identify effective strategies that can enhance pharmacists' readiness to engage in deprescribing practices, particularly among newly appointed primary care pharmacists who may lack confidence in this area. By addressing these barriers and providing appropriate support, it is possible to improve the readiness of pharmacists to participate in deprescribing initiatives, thereby enhancing the overall quality of patient care in primary care settings.

8.2.3.2. Community pharmacists

Contrary to the integration of PCN and primary care pharmacists in deprescribing initiatives, community pharmacists have yet to be assigned a clearly defined role in the deprescribing process. This research proposes a novel role for community pharmacists in ensuring the safety of deprescribing practices within primary care through the implementation of a community pharmacy deprescribing safety net. As discussed in Chapter 7, this role leverages the unique strengths of community pharmacy, including established therapeutic relationships with patients and enhanced accessibility, to establish a safety net that detects and addresses potential adverse outcomes of

deprescribing, thereby safeguarding patient wellbeing. However, it is crucial to acknowledge and address the potential challenges and policy implications associated with the implementation of such a role.

In line with the NHS Long Term Plan and the new workforce implementation plan, there is a growing recognition of the potential of community pharmacists to contribute to patient care (NHS, 2019). The Community Pharmacy Contractual Framework (CPCF) for 2019/20 to 2023/24, a contractual agreement between the NHS and community pharmacies, aligns with these strategies and emphasises the shift towards a more clinical and patient-facing role for community pharmacists. This framework outlines the provision of services and funding for community pharmacies, with a focus on minor illness management, prevention, and the use of technology to enhance dispensing efficiency to allow for more pharmacist time for clinical services (NHS England, 2019a).

One notable development resulting from this contractual agreement is the Community Pharmacy Consultation Service (CPCS) which offers same-day appointments with community pharmacists for minor illnesses or urgent supply of regular medicines. This service aims to improve access to convenient treatment closer to patients' homes (NHS England, 2019b). The emergence of the CPCS coincides with the development of the community pharmacy deprescribing safety net, which leverages similar skills employed in the CPCS, such as patient symptom assessment and the identification of referral needs.

Furthermore, the community pharmacy deprescribing safety net aligns with the current NHS infrastructure and strategies for utilising the skills of community pharmacists to enhance patient care and engagement. The intervention capitalises on the existing NHS framework, although the implementation context within the RWLM require consideration. This convergence of objectives and strategies suggests that the community pharmacy deprescribing safety net is in line with the ongoing efforts of the NHS and the government to optimise the role of community pharmacists and improve patient safety outcomes.

Yet throughout the research presented in this thesis, barriers to the involvement of community pharmacists in deprescribing have consistently emerged, demanding an analysis of how these barriers translate into potential challenges for the developed safety net intervention.

A prominent barrier identified was the lack of time available to community pharmacists to contribute to interventions. In the UK, community pharmacists are involved in various activities such as dispensing and checking medicines, providing medical advice for

minor ailments, and delivering clinical services like the New Medicine Service (NMS) and travel clinics. Despite the expansion of their roles beyond dispensing, it is evident that dispensing activities still consume a significant portion of their time, similar to other countries like Australia (Karia et al., 2022). Consequently, separating pharmacist time from dispensing tasks could potentially free up more time for clinical services, including the proposed intervention. The CPCF has acknowledged this issue and outlined plans to leverage technology to optimise pharmacist time. However, the timing and effectiveness of these measures remain uncertain. At the time of this doctoral research, community pharmacists continued to express concerns about the lack of time available to engage in deprescribing initiatives. To ensure the effectiveness of the community pharmacy safety net, it is crucial to provide pharmacists with dedicated time and adequate reimbursement for conducting the intervention without compromising their dispensing responsibilities.

Financial incentives are another aspect that warrants consideration for promoting participation in the developed intervention. Currently, community pharmacies are paid a fee based on their dispensing volumes, as per Part IIIA of the NHS Electronic Drug Tariff (NHS England, 2020). In Chapter 6, HCPs identified a potential conflict of interest associated with community pharmacists' involvement in deprescribing, as reducing medicine use may lead to a decrease in the number of prescriptions dispensed by community pharmacies. Additionally, the limited participation of community pharmacists in deprescribing studies, as highlighted in Chapter 2, was attributed to undisclosed competing priorities (Korenvain et al., 2020, Martin et al., 2018). While a conflict of interest is possible, it is expected that pharmacists would adhere to the professional standards set by the General Pharmaceutical Council (GPhC), which prioritises patient-centred care and professional behaviour (The General Pharmacutical Council, 2023). Furthermore, adequately reimbursing community pharmacies for their involvement in deprescribing would offset the loss from reduced dispensing volumes. The funding structure for community pharmacies has evolved over the years, moving away from a sole focus on payments based on the number of medicines dispensed, towards remuneration for providing clinical, patient-centred services. An example of this shift is the introduction of the Pharmacy Quality Scheme (PQS) as part of the CPCF in December 2016. This scheme offers financial incentives to community pharmacies for delivering quality care across three dimensions: clinical effectiveness, patient safety, and patient experience (NHS England, 2023). An example of which is pharmacists providing inhaler checks for patients recently starting a new inhaler. Evaluations of the PQS have demonstrated its positive impact on enhancing medicine safety in recent

years (Parekh et al., 2023). Financial incentives were also identified as a facilitator for deprescribing implementation in the systematic review presented in Chapter 4, as they enhance collective action in deprescribing interventions and improve the potential for normalisation, as explained through NPT. Therefore, coupling the implementation of the safety net intervention with financial incentives for participation would enhance the likelihood of engagement by community pharmacists.

8.2.3.3. Care collaboration within primary care

Lastly, it is crucial to address the level of integration of community pharmacy within primary care and the broader healthcare system, particularly in terms of information sharing and collaboration. A significant concern raised by both patients and HCPs regarding the involvement of community pharmacists in deprescribing is the limited access to complete medical records. Patients expressed apprehension that community pharmacists may not possess comprehensive knowledge of their treatment plans, while HCPs were concerned that community pharmacists might lack a holistic view of patients' medical history to provide optimal deprescribing advice. Moreover, community pharmacies have traditionally operated in isolation, with limited sharing of activities or access to information from other NHS providers (Goundrey-Smith, 2018). This current nature of community pharmacy does not align with the requirements of the safety net intervention, as improved access to complete medical records and collaboration with the wider healthcare system can enhance community pharmacists' understanding of potential adverse effects related to deprescribing and enable effective collaboration with other HCPs to address these concerns.

In the UK, community pharmacists currently have access to Summary Care Records (SCR), which contain patient information such as prescribed medicines and allergies, derived from GP records. However, these records lack detailed information, and only GPs have the authority to update them. As a result, recent acute events such as hospital admissions and discharges are not accurately recorded in these records (Greenhalgh et al., 2010). Additionally, it is crucial for community pharmacists to effectively communicate with the HCPs responsible for deprescribing, whether to refer patients for recommencement of medicine or to provide feedback on deprescribing outcomes as part of the intervention's appraisal feedback loop.

The poor interoperability of medical records and the isolation of community pharmacy have long been persistent issues within the NHS (Goundrey-Smith, 2018). Recent initiatives have attempted to establish communication systems with community

pharmacies, such as the Discharge Medicines Service. The NHS Discharge Medicines Service, introduced in 2021 across England, is an essential service for community pharmacies. Its purpose is to improve communication of changes in patient medicines upon hospital discharge to primary care, with the aim of reducing avoidable harm. After patients leave the hospital, they are referred to a community pharmacist who receives information regarding medicine changes made during their hospital stay. This allows the community pharmacist to collaborate with patients and other healthcare professionals in primary care to support patients with their new medicine regimen (NHS England, 2021). The implementation of this service necessitates collaboration between hospitals, community pharmacies, PCNs, and general practices, with electronic communication systems playing a vital role in facilitating this. Throughout this doctoral research, the need for collaboration among HCPs in primary care has been emphasised to facilitate deprescribing. Similarly, the safety net intervention developed from this research relies on collaborative working between community pharmacies and HCPs in general practices. Therefore, exploring the development of electronic communication systems between community pharmacy and wider primary care is essential to assess how it may enhance the adoption of routine deprescribing and the safety net intervention, like the approach taken in the Discharge Medicines Service.

Parallel to the establishment of PCNs to enhance collaborative working, the formation of Integrated Care Systems (ICS) has replaced Clinical Commissioning Groups since July 2022. ICSs are partnerships consisting of the NHS, local councils and authorities, community and voluntary organisations, local residents, patients, and carers, aimed at planning and delivering coordinated healthcare services (NHS England, 2022). The creation of ICSs and PCNs has been driven by the objective of improving collaborative working in primary care, focusing on a systems approach to interventions rather than an individual approach previously utilised. Hence, leveraging these care groups for deprescribing interventions, such as the safety net developed in this research, would be beneficial. This could involve planning the implementation of interventions within these groups or selecting a PCN or ICS to conduct feasibility studies of deprescribing interventions before scaling them up nationally. These collaborative frameworks provide potential platforms for HCPs to work together, supporting the implementation of safe and routine deprescribing in primary care.

8.3. Research outputs and dissemination plans

8.3.1. Research papers and conferences

The research generated from this doctoral project has provided novel and valuable insights that address gaps in the deprescribing evidence-base. As such, it is valuable for the key findings identified to be appropriately disseminated and communicated to the relevant stakeholders. Research dissemination is an integral part of the research project and aids in increasing visibility of research outputs, whilst enhancing the social, political, and economic impact (Marín-González et al., 2017). There is also a moral obligation to those involved within the research study, with many interested in seeing deprescribing as routine practice for their own personal reasons, to see the impact of their involvement in research within the wider world. This may encourage more patients and HCPs to be involved in research and enhance science and innovation within the country.

For these reasons, a dissemination plan was developed to enhance the visibility and impact of this research. Firstly, the researcher and supervision team discussed elements of the doctoral research which would be publishable, as well as identifying journals in which the research would fit within their remit. The journal publishing plan can be seen in Table 26 presents the research publication plan, with its updated progress.

Table 26 – Research publication plan

Research	**Journal**	**Current update**
Barriers and facilitators of implementing proactive deprescribing within primary care: a systematic review	International Journal of Pharmacy Practice (IJPP)	Accepted and published: doi.org/10.1093/ijpp/riad001
Study 2 – Patient interviews	BMC Geriatrics	Writing manuscript
Study 2 – Healthcare	BJGP Open	Writing manuscript

professional interviews		
Developing deprescribing resources for older people with polypharmacy living in primary care: using co-design and logic modelling	BMC Primary Care	Writing manuscript
Combining Normalisation Process Theory and Real-World Logic Modelling	Implementation Science	Writing manuscript

In conjunction to publishing research within journals, an additional aspect of the dissemination plan consists of presenting findings of this research at research conferences. This provides an opportunity to present research outputs, receive constructive feedback on areas the research can be strengthened and network with fellow researchers, patients, and healthcare professionals. Table 27 highlights research conferences in which the researcher has, presented outputs from the doctoral research.

Table 27 – Research dissemination in conferences

Conference	**Research**	**Outcome**
North-East Postgraduate (NEPG) Conference 2020	Stopping Harmful Medicines (Deprescribing) in Primary Care	Oral presentation
NIHR Patient Safety Translational Research Centres (PSTRC) 2021 symposium	Barriers and facilitators to the routine implementation of	Oral presentation

	deprescribing in primary care – A systemic review	
NIHR Patient Safety Translational Research Centres PhD Network event 2021	Stopping harmful medicines (deprescribing) in primary care – Qualitative methods in a pandemic	Oral Presentation
Health Services Research & Pharmacy Practice Conference (HSRPP) 2022	Routinely implementing safe deprescribing in primary care: a scoping review	Oral presentation Abstract published online in International Journal of Pharmacy Practice (IJPP) doi: 10.1093/ijpp/riac021.006
NIHR Patient Safety Translational Research Centres (PSTRC) 2022 symposium	Barriers and facilitators of implementing proactive deprescribing within primary care: a systematic review	Poster presentation
Health Services Research & Pharmacy Practice Conference (HSRPP) 2023	Patient perspectives of safe and routine deprescribing for older people living with polypharmacy: an interview study	Oral presentation – 2nd place prize winner Abstract published online in International Journal of Pharmacy Practice (IJPP) DOI: 10.1093/ijpp/riad021.042
Health Services Research & Pharmacy Practice Conference (HSRPP) 2023	Developing deprescribing resources for older people with polypharmacy living in primary care: using co-design and logic modelling	Poster presentation Abstract published online in International Journal of Pharmacy Practice (IJPP) DOI: 10.1093/ijpp/riad021.041

8.3.2. National collaboration with The Academic Health Service Network

The outputs of this doctoral research have also influenced national attempts to combat problematic polypharmacy within the UK. The Academic Health Service Network (AHSN) is the innovative arm of the NHS, consisting of 15 networks across the country, focuses on disseminating a variety of innovation within the NHS, from new technologies to service improvements (The AHSN Network, 2023). Due to the potential effects of problematic polypharmacy to patient safety and healthcare resource utilisation, the AHSN have initiated a polypharmacy programme looking to address increases in problematic polypharmacy through three pillars: 1) Population Health data, 2) Education and Training, and 3) Public Behaviour Change. The systematic review conducted in Chapter 4 provided evidence that underpinned the successful AHSN bid for the polypharmacy programme.

Pillar 3, which centres on public behaviour change, aims to employ a variety of public-facing campaigns to shift public perceptions away from a culture of “pill for every ill”, and instead encourage patients to engage in open discussions about their medicines. In line with this objective, the Yorkshire and Humber AHSN plans to incorporate the medicine necessity questions developed in this study, particularly in conjunction with a medicines campaign called Me and My Medicines. The Me and My Medicines campaign, led by patients, is focused on empowering patients to raise concerns about their medicines through a communication charter designed to facilitate conversations about medicines between patients and HCPs (Me and My Medicines, 2023). Initial discussions with the Yorkshire and Humber AHSN have explored the possibility of integrating the Me and My Medicines charter to encourage patients to discuss their medicines, while equipping patients with the medicine necessity questions to prompt enquiries about the ongoing need for their medicines. The plan is to pilot the use of the medicine necessity questions across the Yorkshire and Humber region to assess whether this approach is feasible in primary care, leads to an increase in discussions regarding the necessity of patients' medicines and, consequently, a reduction in problematic polypharmacy.

Furthermore, the Lead AHSN for the National Polypharmacy Program and NHS England National Clinical Director for Prescribing (responsible for implementing the action plans from the Overprescribing Review) has also expressed interest in the medicine necessity questions developed. Within the context of public behaviour change, the Lead AHSN have developed materials that support patients attending a SMR. Consequently, they used a SMR invitation letter, previously developed by researchers at the NIHR YH PSTRC, with the medicine necessity questions (Appendix

AB). The SMR invitation letter provides patients with information about the nature and purpose of SMRs, as well as questions they may want to think about and ask during the SMR. Given the nature of the medicine necessity questions, particularly their relevance to the deprescribing process, it was crucial to evaluate the appropriateness of each question for patients before attending an SMR. After careful consideration, it was decided to include selected questions in the SMR invitation letter, as some questions were deemed more applicable to patients who already felt burdened by polypharmacy, which may not be the case for every patient attending an SMR. Additionally, certain questions overlapped with existing questions in the SMR invitation letter and were modified to avoid duplication. To summarise, the following questions were included:

- Why am I taking these medicines?
- Do I still need all my medicines?

Currently, the SMR materials are being developed and will be disseminated across England. In addition, the invitation letter has been translated into eight languages and incorporated into the SMR template in Leeds, rendering it accessible to clinicians throughout the city. The invite letter has also been hosted by the Primary Care Pharmacy Association (PCPA), a national entity that extends support to primary care pharmacists. Additionally, it has been featured in the PrescQIPP bulletin, an initiative funded by the NHS, which is dedicated to the enhancement of quality and optimise prescribing practices by providing easily accessible and evidence-based resources.

8.4. Implications for research, practice, and future research plans

8.4.1. Implications for research

As elucidated in Chapter 4, there is a clear need for increased research in the implementation of deprescribing practices. This encompasses exploring factors relevant to implementation across diverse healthcare settings and improving the reporting of implementation factors within deprescribing studies. While much of the existing deprescribing evidence focuses on the process itself, there is now a crucial shift required towards implementation research to facilitate the implementation of deprescribing into routine care. Although the need for deprescribing implementation research has been acknowledged in the literature, there remains a paucity of evidence in this area (Thompson et al., 2019). By undertaking such research, the implementation

of deprescribing interventions can be well promoted in real-world healthcare settings (Peters et al., 2013). Moreover, this research should be underpinned by implementation science to consider the essential contextual factors associated with deprescribing in various healthcare settings, examine how these factors may hinder or promote intervention delivery, and enhance the uptake of interventions (Bauer and Kirchner, 2020).

As also emphasised in Chapter 4, there is a scarcity of research on the appropriate appraisal, and specifically reflexive monitoring, of deprescribing interventions. The appropriate appraisal of deprescribing interventions by relevant stakeholders may enhance the potential for deprescribing to become normalised, as explained through the lens of the NPT. However, due to the lack of research in this domain, it remains unclear what constitutes a feasible and effective approach to appraising deprescribing for both patients and HCPs. Within the framework of reflexive monitoring in NPT, it is important to examine how individuals attempt to modify newly implemented interventions, how groups assess the value of deprescribing, how individuals appraise the effects of deprescribing on themselves and their work environment, and how the benefits and challenges of deprescribing are identified and measured.

This doctoral research has presented evidence advocating for the involvement of community pharmacists in deprescribing. However, barriers still exist that may impede their participation in deprescribing, particularly regarding limited access to medical records and lack of integration with wider primary care. Community pharmacists represent a valuable and unique resource that can contribute to the successful implementation of health interventions, including deprescribing (Wang et al., 2022). Therefore, to fully leverage this resource, further research should explore strategies to optimise the role of community pharmacists in deprescribing. These roles include providing the necessary support outlined in the deprescribing safety net intervention, as well as offering guidance to patients regarding deprescribing. Such research should also address how to overcome the barriers associated with limited access to medical records and how to improve the integration of community pharmacy with the broader healthcare system.

Finally, while practice pharmacists play a role in deprescribing within primary care through SMRs, it is important to ensure that pharmacists themselves are prepared for deprescribing. Numerous barriers still exist that hinder pharmacists from effectively conducting deprescribing during SMRs. Given that pharmacists are ideally positioned to engage in deprescribing practices, it is crucial to support their readiness in this regard. As highlighted in Chapter 6, this requires minimising identified barriers, such as

the lack of available deprescribing guidance, while enhancing facilitators, such as improving MDT collaboration with respect to deprescribing. Further research is needed to explore how these objectives can be achieved and actively assist pharmacists in real-world practice settings.

8.4.2. Implications for practice

Chapter 6 emphasises the significance placed by patients on being sufficiently convinced by the rationale behind deprescribing. This understanding of the benefits and reasons for deprescribing is crucial in instilling confidence in patients. When introducing deprescribing to patients, HCPs should allocate adequate time and care to effectively communicate this information. Furthermore, the communication should be tailored to meet the individual needs of each patient, promoting effective patient-centred communication and increasing the likelihood of patient satisfaction and improved treatment outcomes as a result (Ruben et al., 2020). Importantly, a convincing deprescribing rationale, leveraging multiple aspects of NPT as discussed in section 8.3.2, can further contribute to the normalisation of deprescribing practices in primary care.

HCPs also highlighted the importance of maintaining deprescribing safety through appropriate follow-ups and providing sufficient safety nets for patients, ensuring they know when to seek help after deprescribing. Therefore, it is essential not to overlook this aspect of deprescribing and to allocate adequate time and resources to monitoring procedures. As patients did not show a preference for who provides such support, there may be an opportunity to involve the wider MDT in this process, particularly if the HCP who initiated the deprescribing does not have the capacity to provide ongoing monitoring. However, if another HCP is introduced to provide monitoring support, it is essential to effectively communicate this to patients, as underlined in Chapter 5. Furthermore, where feasible, HCPs can consider engaging patients in self-monitoring, when appropriate, to enhance their involvement in their own care.

The benefits of MDT collaboration in deprescribing have consistently emerged throughout this doctoral research and should not be underestimated. Research has explored and advocated for the use of a MDT approach to deprescribing, particularly within hospital settings (Heinrich et al., 2023). Therefore, it is imperative to involve an MDT approach to deprescribing in primary care, encompassing all relevant HCPs who can contribute to the deprescribing process. This includes GPs, pharmacists, nurses, and other primary care HCPs such as social prescribers, who can address the

psychological needs of patients post-deprescribing, as suggested in Chapter 5. However, more work is needed to identify a feasible yet effective MDT approach to deprescribing in primary care, drawing on the benefits already identified in research, while avoiding unnecessary involvement of HCPs (Seto et al., 2022).

The involvement of community pharmacists in deprescribing has been extensively explored in this and other research studies (Korenvain et al., 2020, Farrell et al., 2019). However, for this role to be fully realised, it is essential to free up their time to allow capacity for such interventions, as proposed in the CPCF. This research aligns with this proposal and suggests that there needs to be a shift in practice away from dispensing roles, enabling more clinical and patient-facing roles for community pharmacists. Furthermore, current payment structures such as the PQS should be leveraged further to expand financial incentives for community pharmacy clinical activities. This would provide increased motivation for community pharmacists to participate in interventions such as the deprescribing safety net, enabling their valuable input to enrich these interventions while minimising the potential perception of a conflict of interest stemming from reduced dispensing volumes.

8.4.3. Future research plans

The development of the community pharmacy deprescribing safety net intervention presents an opportunity for community pharmacists to maintain deprescribing safety in primary care. However, it is important to note that this is in the early stages of intervention development. The RWLM depicts the programme theory of how the intervention is expected to lead to outcomes. Following the framework of the UK Medical Research Council (MRC), the subsequent phases of intervention development involve feasibility testing, evaluation, and implementation (Skivington et al., 2021). Therefore, the next step is to assess the feasibility and acceptability of the intervention in a manner that employs predefined progression criteria related to intervention feasibility and putative outcomes. This assessment should be conducted through collaborations with stakeholders to establish the expected desirable outcomes of the intervention, the data to be collected for process and outcome assessment, and the available options for designing the evaluation (Skivington et al., 2021). Thus, the next research steps involve designing and subsequently conducting an appropriate feasibility study for the deprescribing safety net intervention in collaboration with relevant stakeholders. It is expected that the RWLM will be further refined based on the

findings of the feasibility study, as demonstrated in other studies that have utilised this approach (Mills et al., 2022).

Similarly, it is important to recognise the need for further work on the medicine necessity questions. Although these questions were co-designed with patients and HCPs, they require additional testing and validation to ensure their usability in practice. As noted by Chan et al. (2023), there are numerous non-validated or untested deprescribing communication tools available, which raises concerns about their reliability and efficacy (Chan et al., 2023). To address these potential limitations, further work will be undertaken to evaluate the medicine necessity questions. This may involve feasibility testing, as described for the deprescribing safety net intervention, or conducting field tests within focus groups consisting of patients and HCPs, a method previously used to validate other deprescribing interventions (Martin et al., 2013). Furthermore, it is important to ensure that the medicine necessity questions are useful for a diverse range of patients, considering the diverse patient demographics encountered in healthcare settings, as well as culturally appropriate (O'Toole et al., 2019). Therefore, it would be valuable to explore the translation of the questions into multiple commonly spoken languages within the UK and consider adaptations for patients with learning disabilities or varying ages and levels of health literacy.

8.5. Research reflexivity

8.5.1. Strength, limitations, and the impact of the COVID-19 pandemic

The methods employed in this doctoral research have several strengths that have significantly enhanced the study. To the best of the researcher's knowledge, the scoping review conducted represents the first comprehensive review of deprescribing focused specifically on patient support, education, training, and barriers/facilitators to implementation in primary care. By utilising search terms synonymous with deprescribing, the review ensured the inclusion of studies that adopted a deprescribing approach even without explicitly using the terminology.

A novel strength of the systematic review is its incorporation of implementation theory to provide theoretical context for understanding implementation barriers and facilitators. This theoretical application offers a clearer understanding of the factors that contribute to the success or failure of interventions in healthcare settings (Nilsen, 2015). The utilisation of the NPT enriched the review by providing valuable insights into barriers and facilitators through its constructs and sub-constructs. Furthermore, by following the

PRISMA guidelines for reporting systematic reviews, this provided a rigorous structure and transparency when conducting and writing the systematic review. Additional involvement of the wider supervision team in screening search results and discussing data extraction also aided in enhancing the rigour of the systematic review.

The qualitative studies conducted in Chapters 5 and 6 provided valuable insights into patients' perspectives on deprescribing implementation in primary care. These studies shed light on the information patients desired, the support they expected, and their views on the HCPs involved in deprescribing. Additionally, the studies explored the perspectives of HCPs on deprescribing, including its implementation, safety considerations, and the role of pharmacists. A noteworthy strength of the qualitative methods employed was the use of framework analysis to analyse the interview and focus group transcripts. As previously discussed in Chapter 3, framework analysis is a well-established and rigorous method for analysing qualitative data, particularly in healthcare research (Gale et al., 2013, Furber, 2010). This approach facilitated a systematic extraction of key themes from the collected data. Moreover, the involvement of the research supervision team in reviewing codes, comparing them to their own coding and interpretation of the data using example transcripts, further strengthened the analysis process. Furthermore, research findings were disseminated back to research participants as good practice and to also confirm the findings, allowing participants to highlight potential areas they disagreed with, if present. However, this was not the case, with multiple participants content with the findings and being involved in the research.

Another strength of the qualitative studies was the incorporation of NPT in the interview and focus group guides. By asking questions related to patient confidence and involvement in deprescribing, derived from the sub-constructs of relational integration and legitimation in NPT, a deeper theoretical understanding was gained regarding the factors that support patient confidence and involvement in deprescribing, and their significance in the process of normalising deprescribing practices. Similarly, by posing questions derived from multiple constructs of NPT to healthcare professionals, theoretical insights were gained into their perceptions of their involvement in deprescribing, strategies to enhance engagement in deprescribing, the prevailing consensus on deprescribing among HCPs, the nature of deprescribing training required, and the available support to promote deprescribing practices in primary care.

Maintaining a research journal throughout the qualitative studies, documenting thoughts, impressions, and ideas from data collection to analysis, added to the reflexivity within the qualitative studies. One such example was reflecting on and

appreciating that a minority of the patient responses in Chapter 5 were from participants who were consistently involved in in patient research (NIHR People in Research), and so may be more knowledgeable on healthcare matters in comparison to other patients. As a result, the doctoral researcher reflected on how such views may not be common with the average patient but are still significant as they are from an NHS patient. This practice of reflexivity deepened the researcher's understanding of the topics under investigation and enhanced the credibility of the research (Dodgson, 2019).

Within the final study, the use of co-design methodology was a fundamental strength. Literature has shown misalignment between researcher aims and patient needs is a major cause of research waste, however the use of co-design can reduce this misalignment by providing a patient and HCP focus (Slattery et al., 2020). The input that patient and HCP participants provided allowed for key stakeholder views to be core within the intervention development to ensure outputs produced are relevant to current patient and HCP needs. Furthermore, the novel use of a RWLM allowed for thorough consideration of the intervention context, which is needed to understand and guide intervention scale-up outside of the initial research settings (Mills et al., 2019). By combining the use of RWLM and NPT in a novel approach, it is hypothesised this will improve the scalability and normalisation of the intervention within primary care. Furthermore, seeking feedback on the medicine necessity questions developed highlighted the potential benefits that patient identified from the resource, but also potential areas that could be further developed through research and further feasibility studies.

However, it is important to acknowledge certain limitations in the doctoral research methods. In the scoping review, only the thesis author assessed the entire search results, which introduces the possibility of missed studies. Nevertheless, a second reviewer assessed 10% of the search results, and the thorough search strategy instils confidence that the most relevant literature was identified. Additionally, the review was limited to English language articles, potentially overlooking relevant studies in other languages. Furthermore, no formal quality appraisal of the literature was conducted, although this is not customary in a scoping review approach.

Similarly, the systematic review included only English language articles, again potentially overlooking relevant studies in other languages. While multiple authors participated in the screening process, only the doctoral researcher screened all identified articles and mapped barriers and facilitators to NPT constructs. However, the

research team extensively discussed examples and subjected 10% of the shortlisted articles to a full-text double-screening process to minimise this limitation.

Within the qualitative studies, several limitations should be considered, some of which directly resulted from the COVID-19 pandemic. To comply with social distancing restrictions, interviews and focus groups were conducted online or via telephone. This may have excluded patients who were not comfortable with these methods. Efforts were made to minimise this limitation by providing assistance to patients on how to connect online or via telephone for interviews. The use of online data collection has increased in qualitative research during the COVID-19 pandemic, particularly in medical, nursing, and psychology domains (Torrentira, 2020, Salvador et al., 2020). In one comparative analysis study, a comparison was conducted between online and in-person qualitative interview methods within the healthcare research. Interview data was collected through both online and in-person, subsequently undergoing a comparative assessment. The study's findings demonstrated a marginal superiority of in-person interviews over online video calls in terms of participants expressing themselves with a greater word count. However, it was noted that both interview formats generated similar themes and a comparable word count (Krouwel et al., 2019). Online or telephone methods can facilitate participant interaction and understanding of social perceptions on the research topic. However, moderation of interviews and focus groups can be challenging, requiring skilled facilitators, and data security on online platforms must be considered. Ensuring participant confidentiality may also present challenges (Hensen et al., 2021). These limitations were addressed during the study design by involving research supervisors and PPIE to co-facilitate focus group sessions to promote discussions, using the recommended video conferencing program (Microsoft Teams®), and minimising the use of participant names whenever possible. Nevertheless, potential participants needed to meet technological and logistical requirements, which introduces the risk of only involving participants who could fulfil these requirements (Lobe et al., 2020).

During the pandemic, the UK experienced multiple lockdowns, and many HCPs provided remote care to adhere to social distancing guidelines. Reduced access to HCPs during this period may explain why patients emphasised the importance of seeing and/or speaking with HCPs during deprescribing. This emphasis could lead patients to favour the involvement of community pharmacists in deprescribing, as community pharmacies remained open and accessible during the pandemic. However, it is well-documented that patients face challenges in accessing care services, particularly in primary care, even before the pandemic (Campbell and Salisbury, 2015).

The accessibility of community pharmacists has also been noted in the literature prior to the pandemic (Todd et al., 2015). Therefore, it can be argued that discussions regarding accessibility to HCPs during deprescribing would have emerged regardless of the COVID-19 pandemic. A limitation of the study sample was the lack of ethnic diversity, which introduces the risk of missing the views of those from other ethnic races or communities. Finally, it was observed that some patients recruited through the NIHR People of Research website frequently participate in healthcare research and may possess a higher level of healthcare knowledge compared to the general population. Although this was evident in some interviews, the number of patients recruited through the NIHR People of Research was less than a quarter of the total study population.

Regarding the limitations of the co-design methods employed, while patients from diverse demographic backgrounds contributed to the development of the medicine necessity questions, they were all proficient in English during the workshops. Patients who have a native language other than English or have limited literacy capabilities may encounter difficulties in understanding or formulating questions. Another limitation to consider is that the feasibility of using the medicine necessity questions and the deprescribing safety net intervention has not been explored. Thus, implementing them into practice may require adaptations to ensure their feasibility for patients and HCPs. It is worthwhile also acknowledge that the online nature of the co-design groups may have inhibited participation of patients who were not confident in using technology, and thus the resources developed could potentially be more skewed to those who are.

As previously mentioned, much of the research methods, including the reviewed articles and the generated outputs, were conducted in English. This decision was based on practicality, as the researcher is fluent in English and the study was conducted in the English-speaking country of the UK. However, it is essential to consider the equity of the research and its outputs. Health equity aims to achieve the highest possible standard of health for all individuals, with particular attention to those at the highest risk of poor health due to social conditions (Castillo and Harris, 2021). Consequently, underrepresentation of minority populations in healthcare research, who often experience poorer health outcomes, can result in insufficient research data on how to best support these patients (Farooqi et al., 2022). One approach to improving equity in research is to include non-English speakers in research studies and provide adequate support for their participation. This includes ensuring that study materials are accessible in multiple languages and designing recruitment approaches that facilitate the inclusion of non-English speaking participants (Castillo and Harris, 2021). Although

resource limitations prevented the implementation of such strategies in this doctoral research, their importance is acknowledged, and future research conducted by the researcher will strive to incorporate these approaches to enhance the equity of healthcare research in the future.

8.5.2. Reflecting on the use of NPT in research

As discussed in previous chapters, the underpinning of this doctoral research with NPT has proven valuable in achieving a comprehensive theoretical understanding of the contextual factors influencing the normalisation of deprescribing in primary care. Through this approach, gaps in knowledge regarding the potential for normalisation have been identified, while also elucidating how the developed outputs can contribute to the enhancement of deprescribing normalisation. The utilisation of NPT in research, especially for the development and evaluation of complex health interventions in UK primary care, has gained considerable traction since the commencement of this doctoral research (Huddlestone et al., 2020).

Moreover, the novel integration of NPT with RWLM techniques has been undertaken, which has not been previously explored. This integration has allowed for the utilisation of RWLM's advantages, particularly its focus on contextual factors and their influence on the intervention, alongside the theoretical understanding of how intervention mechanisms and implementation strategies can enhance the normalisation of the intervention itself. The heightened attention to the intervention context facilitated by RWLM is essential for improving the scalability of the intervention and advancing implementation processes (May et al., 2016, Edwards and Barker, 2014). Simultaneously, the presence of NPT constructs within the RWLM offers an opportunity to identify intervention components that can be further leveraged to enhance normalisation potential. For instance, if implementers encounter difficulties in sense-making regarding the safety net intervention during implementation, this issue may be addressed by intensifying efforts in implementation strategies such as raising awareness of the intervention and providing staff training. Similarly, additional emphasis can be placed on the initial step of the intervention mechanism, i.e., enhancing patients' and healthcare professionals' understanding of the purpose of the safety net intervention.

To the best of the authors' knowledge, only one other example in the literature has attempted to combine NPT with logic modelling. This is was a doctoral thesis exploring the theory-practice gap in health interventions and the potential of NPT to facilitate

knowledge transfer into practice (Jones, 2020). However, several key distinctions exist between that work and the present doctoral research, including the diverse range of NPT applications within this research, particularly in the systematic review, the adoption of RWLM instead of a traditional linear logic model for enhanced contextual considerations, and the inclusion of NPT constructs within the RWLM framework itself.

In summary, this doctoral research has advanced applied healthcare research methodology, specifically of NPT and RWLM, introducing novelty in their application and highlighting the benefits of their integration in the context of deprescribing implementation. Furthermore, NPT has demonstrated its flexibility as a framework, as intended by its authors, effectively aiding the researcher in achieving deeper understandings of deprescribing in primary care (May et al., 2018).

It is important to also acknowledge the challenges encountered in the use of NPT. One notable challenge pertains to mapping contextual and intervention factors to NPT constructs, which sometimes resulted in overlaps across multiple constructs and subconstructs of NPT. This issue of overlapping constructs has been acknowledged as a challenge in NPT use, particularly in qualitative data analysis employing a framework approach (May et al., 2018). In the absence of explicit guidance on how to address such situations, an executive decision was made to allow for these overlaps. This approach aimed to demonstrate how factors may influence multiple NPT constructs and ensure a consistent approach to enhance research rigour.

Another challenge related to the difficulty in identifying techniques to enhance intervention components within the constructs of NPT. NPT is described as a normative idealised model that identifies how things should be, indicates the direction toward implementation success, and assesses what is favourable in implementation terms (Alharbi et al., 2014). While NPT effectively highlights areas for improving the implementation of interventions, it provides limited guidance on specific strategies for doing so. For example, in this research, the identification of the lack of reflexive monitoring associated with deprescribing in Chapter 4 indicates the need for increased appraisal of deprescribing interventions, but it does not offer detailed guidance on how to modify interventions to achieve this. Additionally, there is a scarcity of studies specifically investigating how to leverage NPT constructs to improve intervention normalisation (May et al., 2018). Having more guidance on effectively enhancing intervention components within constructs of NPT would facilitate the production of specific recommendations to guide the implementation of deprescribing in primary care.

Lastly, NPT was employed in the qualitative phase of this research through the use of a coding framework adapted from previous literature and to inform interview questions aimed at identifying key deprescribing implementation factors (Mair et al., 2012, Morris et al., 2016, Glynn et al., 2018, O'Connor et al., 2016). While these methods were valuable in identifying key findings, it is worth noting that they were derived from research conducted by authors who were not originally involved in the development of NPT, raising questions about their appropriateness and the availability of guidance. In response to this concern, the authors of NPT have since developed an NPT coding manual specifically for qualitative research. The coding manual was created through a process of content analysis of literature on NPT development, utilisation, and restructuring of constructs, as well as piloting the coding manual with interview data and empirical evidence. The outcome of this process was a readily available coding manual that consolidated previous advancements in NPT, simplified its application in qualitative research, and facilitated transparent data analysis processes (May et al., 2022). Although this research was unable to incorporate the coding manual due to its timing, its use would be carefully considered in future implementation research.

8.5.3. Reflection on the doctoral research journey

As an early-career researcher, the doctoral research process has been a challenging journey. Balancing my role as a pharmacist with the demands of the doctoral program required careful consideration to prevent personal assumptions and biases from influencing the data collection and analysis process. However, my dedication to providing patient-centred care and my first-hand experience of speaking to patients distressed by polypharmacy served as constant motivation throughout the research.

Throughout the course of this research, I consistently encountered patients and members of the public who shared concerns about polypharmacy. Whether it was their own experience or that of a family member burdened by a long list of medicines, the urgent need to address problematic polypharmacy resonated strongly with these individuals. It became evident that the issue of problematic polypharmacy is widespread, yet rarely discussed in everyday conversations, leaving many people silently suffering. This realisation further fuelled my determination to work diligently on this project for the benefit of those who may be impacted.

Initially, the concept of deprescribing appeared straightforward, with the naive assumption that discontinuing a medicine is as simple as initiating it. However, through my interactions with various HCPs, it became apparent how current healthcare

systems may unintentionally prioritise prescribing, driven by service pressures and the challenges posed by a growing population and workforce shortages. Consequently, even HCPs who recognise the problems associated with polypharmacy may feel unsupported in their efforts to take action, while patients may believe that every prescribed medicine is intended for lifelong use, considering any deviation from this notion as non-compliance.

Consequently, this research not only motivated me to complete my doctoral studies but also instilled a personal passion to advocate for safe deprescribing throughout my career until it becomes as commonplace as prescribing. Despite facing numerous challenges during this doctoral research, particularly during the uncertain times of the COVID-19 pandemic, which involved personal losses and extended periods of social isolation, my drive and passion consistently reminded me of the significance of this research. Moreover, engaging in discussions with my supervisors, academics, fellow PhD students, patients, and HCPs regarding this research provided hope that healthcare systems can undergo positive transformations, with this work serving as a foundation for meaningful change in the NHS.

8.6. Conclusion

This doctoral research has yielded novel findings that have contributed to the current understanding of deprescribing implementation in primary care. It has identified gaps in the existing deprescribing literature, particularly in relation to the normalisation of deprescribing practices. In response, the research has developed deprescribing resources aimed at promoting the safe and routine implementation of deprescribing in primary care. The research design employed pragmatic methods, guided by the MRC guidance for complex intervention development, and complemented by the involvement of PPIE to maintain a patient-centred approach. NPT has also been utilised to provide a comprehensive underpinning theoretical framework for understanding the normalisation process of deprescribing in primary care.

Four key contributions stemmed from this research. First is the contribution to the domain of knowledge. Through the systematic review conducted in Chapter 4, this research has contributed enhanced understanding of the barriers and facilitators to implementing deprescribing in primary care. Particularly utilising the lens of implementation science with NPT. Next are the contributions to the domain of practice. The development of the medicine necessity questions, and the community pharmacy

deprescribing safety net introduced novel ways in which deprescribing conversations can be initiated, and an intervention to promote safety following deprescribing in practice. Finally, contributions to methodology. The approach of combining NPT with RWLM has furthered the field of implementation science and provides a novel way in which intervention development can be contextualised to bolster implementation success.

In conclusion, this research has made significant and novel contributions to the field of deprescribing in primary care, offering insights into its implementation and providing valuable resources to potentially facilitate safe and routine deprescribing practices. Furthermore, it has advanced the understanding of the NPT and the RWLM, while also offering recommendations for clinical practice, policy development, and future research.

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Appendices

Appendix A – Search strategy for scoping review

Cochrane Search Strategy	
#1	Deprescrib*
#2	MeSH descriptor: [Deprescriptions] explode all trees
#3	medic* cessation
#4	medic* withdrawal
#5	Stopping medic*
#6	Drug discontinuation
#7	Treatment withdrawal
#8	discontin* adj3 (medication* or prescription* or drug*)
#9	?Medic* adj2 (Cessation or stop*)
#10	Cessation of medic*
#11	Stopping of medic*
#12	MeSH descriptor: [Withholding Treatment] explode all trees
#13	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12
#14	Primary Care
#15	Community Health Cent*
#16	MeSH descriptor: [Community Health Services] explode all trees
#17	Community Medic*
#18	MeSH descriptor: [Community Medicine] explode all trees
#19	MeSH descriptor: [General Practice] explode all trees
#20	General Practice
#21	Addiction

#22	Secondary Care
#23	Hospital
#24	Withdrawal Symptoms
#25	Abuse
#26	Pharmaco*
#27	Pharmacodynamic*
#28	Smoking
#29	Alcohol
#30	#13 NOT #21 NOT #22 NOT #23 NOT #24 NOT #25 NOT #26 NOT #27 NOT #28 NOT #29
#31	#14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20
#32	#30 AND #31
PubMed Search Strategy	
#1	(((((General practice[MeSH Terms]) OR Primary Health Care) OR Community Medic*)) AND (((((((Deprescriptions[Mesh]) OR Deprescrib*) OR medic* cessation) OR medic* Withdrawal) OR Stopping Medic*) OR treatment withdrawal) OR Drug discontinuation)) NOT ((((hospital) OR secondary care) OR addiction) OR withdrawal symptoms)
Web of Science	
#1	TS=Deprescrib*
#2	TS=medic* withdrawal
#3	TS=treatment withdrawal
#4	TS=medic* cessation
#5	TS=Drug discontinuation
#6	TS=Stopping Medic*
#7	TS= Deprescriptions
#8	7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1
#9	TS=General Practice

#10	TS=Primary Care
#11	TS=community Medic*
#12	#11 OR #10 OR #9
#13	TS=Addiction
#14	TS=Secondary Care
#15	TS=Hospital
#16	TS=Withdrawal Symptoms
#17	TS=Abuse
#18	TS= Smoking
#19	TS=Alcohol
#20	#8 NOT #13 NOT #14 NOT #15 NOT #16 NOT #17 NOT #18 NOT #19
#21	#20 AND #12
Embase	
#1	Primary Care.tw
#2	Community Medic*.tw.
#3	General Practice.tw.
#4	Community Health Services/
#5	Deprescription/
#6	"Medic* cessation".tw.
#7	"Medic* withdrawal".tw.
#8	"drug discontinuation".tw.
#9	Treatment withdrawal.tw.
#10	Stopping Medic*.tw.
#11	Stopping of Medic*.tw
#12	Cessation of Medic*.tw
#13	Deprescrib*.tw.

#14	discontin* adj3 (medication* or prescription* or drug*)
#15	?Medic* adj2 (Cessation or stop*)
#16	Community Medicine/
#17	treatment withdrawal/
#18	General Practice/
#19	Addiction.tw.
#20	Secondary Care.tw.
#21	Hospital.tw
#22	Withdrawal symptoms.tw.
#23	Abuse.tw.
#24	Smoking.tw
#25	Alcohol.tw
#26	1 or 2 or 3 or 4 or 16 or 18
#27	5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 17
#38	26 and 27
#31	19 or 20 or 21 or 22 or 23 or 24 or 25
#32	28 not 29
Medline	
#1	General Practice/
#2	Community Medic*.tw.
#3	deprescriptions/
#4	"Medic* withdrawal".tw.
#5	"Medic* Cessation".tw.
#6	Deprescrib*.tw.
#7	“Drug discontinuation”.tw.
#8	“Treatment withdrawal”.tw.

#9	“Stopping medic*”.tw.
#10	discontin* adj3 (medication* or prescription* or drug*)
#11	?Medic* adj2 (Cessation or stop*)
#12	Cessation of medic*.tw
#13	Stopping of medic*.tw
#14	Community Health Services/
#15	Primary Care.tw
#16	General Practice.tw.
#17	Primary Health Care/
#18	Community Dwelling .tw.
#19	1 or 2 or 14 or 15 or 16 or 17 or 18
#20	3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
#21	19 and 20
#22	Addiction.tw
#23	Hospital.tw
#24	21 not 22 not 23
International Pharmaceutical Abstracts	
#1	Deprescrib*.tw.
#2	deprescriptions.tw.
#3	"Medic* withdrawal".tw.
#4	"Medic* cessation".tw.
#5	Stopping medic*.tw.
#6	Stopping of medic*.tw
#7	Cessation of medic*.tw
#8	Drug discontinuation.tw.
#9	Treatment withdrawal.tw.

#10	discontin* adj3 (medication* or prescription* or drug*)
#11	?Medic* adj2 (Cessation or stop*)
#12	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11
#13	Primary care.tw.
#14	General Practice.tw.
#15	Community medic*.tw.
#16	Primary Health Care.tw.
#17	13 or 14 or 15 or 16
#18	12 and 17

Appendix B – Study characteristics for intervention studies

Author & Country	Study Design	Aim	Population	Intervention type	Pre/Intervention education	Follow-up & type
Vicen et al. 2014 Spain	RCT Cluster level	Compare the effectiveness of two interventions with usual care on the discontinuation of long term BZD use in primary care	Patients, 18-80 years, taking BZD daily for at least 6 months N = 523	SIF & SIW groups: educational interview & stepped BZD dose reduction. SIF group included follow-up whilst SIW group received written instructions reinforcing educational material	3-hour workshop on structured interviews, individualised patient information & training in managing discontinuation. SIF group attended 30min workshop about follow ups	SIF group: support every 2-3 weeks (SF) All reviewed at 12 months (MF)
Martin et al. 2018 Canada	RCT Cluster level	Determine effectiveness of a pharmacist-led intervention to educate older adults and physicians about reducing PIMs	Patient, 65 years ≤, who filled for 1 of 4 PIMS for ≥ 3 months N = 489	Pharmacies issued patient educational brochures and provided physicians with pharmaceutical opinions recommending deprescribing	None reported	6 months (MF)

Gompel et al. 2009 Netherlands	RCT Cluster level	Determine the effectiveness of an intensive support programme for CP's to send discontinuation letters in cooperation with GPs	Community pharmacies N = 79	CP in active arm received study manual, meeting, and phone calls for aid. BZD discontinuation letter, signed by CP and GP, sent to patients long term BZD users in all groups	CP's provided with education manual about project and resources, an interactive educative meeting and phone calls as reminders for intervention and support	8 months (MF)
Zitman & Couvée 2001 Netherlands	RCT Patient level	Compare efficacy of paroxetine and placebo for treatment of major depression, in tapering off BZD and to evaluate long-term efficacy of programme	Patients (daily use ≥ 3 months), major depression and 18≤ years N = 230	Patients transferred onto diazepam, randomised to receive paroxetine, then gradual BZD taper	Participating doctors were trained in applying MINI interview and the Hamilton rating scale for depression. Booster training used during the study	Average 2.3 years (MF)
Curran et al. 2003 UK	RCT Patient level	To determine if withdrawal from BZD leads to changes in patients	Patients, 65 years ≤, taking BZD (≥ 6 months)	Group A: BZD gradually tapered over 8/9 weeks, group B: continued normal BZD use. Tasks used to	None reported	52 weeks (MF)

		cognitive functions, quality of life, mood and sleep	N = 138	assess cognition, alertness and psychomotor speed and kept a sleep diary. Group C did not withdraw BZD and partook in same tasks.		
Kuntz et al. 2019 USA	RCT Patient level	Evaluate the impact of direct-to-patient education among older patients against usual care	Patients, 64 years ≤, received 2-3 dispensing's of a Z drug during 2016 N = 149	Patients randomised to Ed and Ed+ group received a brochure, physician letter and quiz. A pharmacist called Ed+ group, 4 weeks after receiving material to provide additional support on tapering medicines.	Educational brochure, physician letter and quiz focused on harms of Z-drug use, reconsidering Z-drug use, alternatives and a tapering schedule	6 months (MF)
Eveleigh et al. 2018 Netherlands	RCT Cluster level	Evaluate the effectiveness of a recommendation to cease antidepressant treatment	Patients using antidepressants (≥9 months) without suitable indication N = 146	Patient specific letter containing discontinuation recommendation sent to GP. GP to invite patient, discuss letter and return slip sent to ascertain patients intentions to comply	Letter to GP included information on antidepressant tapering and discontinuation syndrome	1 year (SF & MF)

Choudhury et al. 2007 UK	RCT Patient level	Examine the effect of withdrawing ICS in people with COPD in primary care	Patients, 40 years ≤, history of smoking, prescribed ICS ≥6 months N = 260	Patients randomised to ICS or placebo. GP's managed exacerbations based on usual guidelines. Patients given diary card to record exacerbations.	Patients taught how to use diary cards	Every 3 months (SF) for 1 year (MF)
Tannenbaum et al. 2014 Canada	RCT Cluster level	Compare the effect of the effect of direct consumer educational intervention against UC on BZD therapy discontinuation in older adults	Patients, 65 years ≤, receiving long term BZD (≥ 3 months) and a minimum of 5 active Rx N = 303	Active arm received a deprescribing patient empowerment with a tapering protocol. The control received UC. All patients encouraged to speak to pharmacists/physicians to discuss deprescribing	Empowerment included a self-assessment component about BZD risks, medicine interactions, peer champion stories and suggestions for alternatives.	6 months (MF)
Clyne et al. 2015 Ireland	RCT Cluster level	Investigate the effectiveness of a multifaceted intervention on reducing PIP in older people in primary care	Patients, 70 years ≤, receiving PIP N = 196	Academic detailing with a pharmacist on how GP's can review patients medicines, alternative treatment algorithm for PIP and tailored patient information leaflet	Intervention involved 30 min GP education by pharmacist on PIP, patient information leaflet and web based treatment algorithm.	4-6 months (MF)

Luymes et al. 2018 Netherlands	RCT Cluster level	Evaluate whether deprescribing preventative cardiovascular medicine in low risk patients without indication is safe and cost effective	Patients, 40-70 years, without established CVD, using potentially inappropriate preventative medicine (≥ 1 year) N = 1386	Research nurse advised patients to contact GP about deprescribing preventative medicines. GP's followed predefined deprescribing guideline	Two hour workshop about the background, aim and intervention of the study, delivered to GP's	12 weeks – 6 months (SF) 17-32 months (MF)
Campbell et al. 1999 New Zealand	RCT Patient level	Assess the effectiveness of psychotropic medicine withdrawal and an exercise programme in reducing falls in older people	Patients, 65 years ≤, currently taking hypnotic, antidepressant or tranquiliser N = 93	Patients visited at home and were randomised to either: gradual psychotropic withdrawal and/or home based exercise programme.	None reported	44 weeks (MF)
Martin & Tannenbaum	Post-hoc analysis	Examine whether cognitive status affected the	Patients, 65 years ≤, receiving long	As of Tannenbaum et al. 2014. MoCA used to asses cognition	As of Tannenbaum et al. 2014.	6 months (MF)

2017 Canada		comprehension and success rates of the EMPOWER educational approach to deprescribe BZD	term BZD (≥ 3 months) and a minimum of 5 active Rx N = 261			
Vicens et al. 2016 Spain	Follow up of Vicen et al. 2014	Assess the 3-year efficacy of two primary care interventions delivered by GPs on cessation of BZD use in long-term users	Patients, 18-80 years, taking BZD daily for at least 6 months N = 523	As per previous study	As per previous study	36 months (MF)
Clyne et al. 2016 Ireland	Follow up of Clyne et al. 2015	Determine whether improvement in PIP short term was sustained at 1 year follow up	Patients from previous study N = 186	Outcome data collected 1 year post intervention completion	None reported	1 year (MF)
De Gier et al. 2010 Netherlands	Follow up of Gorgels	Describe the 10-year follow-up of short term quitters	Patients that had stopped BZD after 3	Follow up with patients and calculate defined daily	None reported	10 years (MF)

	et al. 2005	and identify determinants of successfully maintaining discontinuation	months in previous trial N = 194	doses to determine BZD use		
Couvée et al. 2002 Netherlands	Follow up to Zitman & Couvée 2001	Assess longitudinally the Rx of psychotropic drugs in depressed patients after participation in BZD discontinue programme	Patients from previous study N = 189	Researcher accessed medical records of patients and assessed for psychoactive medication	None reported	Average 2.4 years (MF)
Ammerman et al. 2019 USA	Cohort study	Compare the effects of a Geriatric Patient-Aligned Care team (GeriPact) on deprescribing of PIMs in older adults with UC in VA setting.	Veterans, 80 years ≤, who have filled a PIM N = 568	The GeriPact team (inter-disciplinary team) including a clinical pharmacy specialist followed patients over a period of time	None reported	Patients in GeriPact team averaged 2.7 visits vs 3.7 in usual care (MF)

Prasad et al. 1997 UK	Cohort Study	Evaluate withdrawal of antihypertensive treatment in primary care	Patients taking monotherapy for hypertension N = 36	ABPM and clinic BP readings taking during treatment. If daytime ABPM ≤ 150/90 mmHg, treatment was stopped. Measurements taken week 4, 8, 12, 26, 39, and 52 unless ABPM > 150/90 mmHg, where treatment would restart	Advice on non-pharmacological measures to lower BP given to all patients	52 weeks (MF)
Aylett et al. 1999 UK	Cohort Study	Determine the proportion of hypertensive patients that can withdraw medicine without relapse and seek factors associated with withdrawal success	Patients, 40-69 years, hypertensive N = 224	Patients with optimal blood pressure selected and provided with information sheet. Medicine withdrawal followed a protocol. Medicine restarted if BP rose to level indicated treatment, at the patients physicians discretion.	Each practice received educational material on BP measurement. Patient information sheet explained care they would receive and emphasised lifelong follow up even if medicine stopped. Information on BP risk factors provided.	3 years (MF)
Gorgels et al. 2006 Netherlands	QET	Assess long term effects of BZD discontinuation	Patients taking BZD, ≥ 3	Letter sent with advice to gradually discontinue BZD	None reported	21 months (MF)

		letter followed by evaluation consultation in a family practice	months, within 3 months of study N = 3383	then invite 3 months later to discuss BZD use		
Gorgels et al. 2005 Netherlands	Logistic regression of Gorgels et al. 2005	Identify predictors of short/long-term discontinuation of BZD and relapse in use after a minimal intervention	Patients taking BZD, ≥ 3 months, within 3 months of study N = 1707	Logistic regression	NA	6 months and 21 months (MF)
Anderson et al. 2019 Australia	QET	Assess feasibility, effectiveness and safety of a GP-led intervention to minimise PIP	Patients, 65 years≤, community living, taking 5≤ medicines, proficient in English N = 145	Deprescribing consultations with between patients and GP's with a comprehensive medicines review using a software template	5-hour face-to-face deprescribing workshop for clinicians, centred on cease deprescribing principles	18 weeks (MF)
Straand et al. 1993 Norway	QET	Elaborate, implement and evaluate a strategy for discontinuation	Patients, 75 years ≤, living at home N = 33	Patients were stepped down from diuretic therapy followed by diuretic withdrawal	None reported	3, 6, 12, 16 and 26 weeks for 6 months (MF)

		of long term diuretics in elderly patient in general practice				
Coyle et al. 2019 UK	QET	Determine if a nurse-led educational programme and rescue therapy helps patients achieve sustained reduction in PPI use	Patients, 18-90 years, active PPI repeat Rx, treated with PPI ≥ 2 months N = 6249	Patients invited to 20 min visit. Structured history taken and patient given education. Alcohol intervention and smoking cessation offered. Action plan agreed and patients received alginate for rebound symptoms	Patient education was in verbal and written form. Education was about patient's condition, alternative treatment, and triggers.	Follow up offered according to need (SF) 1 year (MF) 2 years for 3 GP's (MF)
Duijn et al. 2011 Netherlands	QET	Explore the feasibility and consequences of a re-evaluation programme for patients without target organ damage being treated for	Patients, 25-75, no known target organ damage, receiving medicine for hypertension and/or hypercholesterol	At visit, nurse would calculate patients 10 year cardiovascular mortality risk. If risk low, patient invited to discuss medicine with GP and provided with medicine tapering schedule if willing to stop. Follow up consisted of clinical	None reported	Follow up based on patient risk (SF) 1 – 12 weeks (SF) and 6 months (MF)

		hypertension and/or hypercholesterolaemia	aemia in the past year. N = 562	measurements and possible ADR		
Walsh et al. 2016 Canada	QI project	Evaluate a tool & process to guide reassessment & deprescribing of PPI's Assess utility/barriers of implementing deprescribing process	Patients, 18 years ≤, taking PPI ≥ 8 weeks, with upcoming health examination n = 46	PPI deprescribing tool developed from current guidelines, EMR reminder to assess PPI use in upcoming appointment sent to PCP, patient handout supplied if needed	Patient handout contained information about harms of long term PPI use, the taper process and management of rebound symptoms	10 weeks (MF)
Farrell et al. 2019 Canada	QI Project	Build CP capacity to integrate deprescribing into daily practice through training and workflow strategies	Community Pharmacies N = 4	Use of deprescribing guidelines. Trained observers provided potential activities and opportunities. Pharmacies selected their own implementation strategies, PDSA cycles used to show	Each site received support and educational resources including project orientation video. Advisory group formed to provide direction on deprescribing work flow.	5 months (MF)

				how interventions implemented		
Odenthal et al. 2020 USA	Service Evaluation	Develop, implement and evaluate the effectiveness of a pharmacist-managed PPI deprescribing protocol in a primary care clinic	Patients, 18 years ≤, taking PPI longer than 8 weeks without valid indication N = 50	Patients identified by pharmacist who organised meeting with physician where possible. During visits pharmacist managed PPI deprescribing protocol, involving gradual tapering	Pharmacist provided education to patients about risks of long term PPI use, alternatives treatment. After visit information given reinforcing education material	8 weeks (MF)
Greiver et al. 2019 Canada	Study Protocol	Evaluate the impact of the SPIDER model compared to UC in the management of PIPs	Patients, 65 years ≤, reciving ≥ 10 different prescription medicines over the past year	Practices within the intervention will become part of a collaborative group, work with QI coaches, review EMRs and develop and implement changes to medicines	Practices will have collaborative learning opportunities to develop medicines management	Na
Vicen et al. 2019 Spain	Study Protocol	Analyse the effectiveness of an intervention targeted to GPs to	Primary health care centres	GP's within the intervention will receive a workshop, feedback around their BZD prescribing practices and	Two hour educational workshop will involve rationale for prescribing BZD prescription and	Na

		reduce BZD prescription and evaluate the implementation process		access to a support web page	strategies for BZD deprescribing. Support web page will reiterate BZD best practices and provide self-help educational leaflet for patients	
Rieckert et al. 2019 Germany	Study Protocol	Evaluate the effectiveness of the arriba-PPI tool	Patients, 18 years ≤, taking PPI ≥ 6 months	GP's within the intervention will have access to the tool to be used with patients. The tool provides guidance on whether stopping PPI is recommended. GP's are to discuss this with patients and make a decision regarding use	Study staffs provide training to GP's and nurses about the use of PPI, shared decision making, withdrawal of medicines and how to use the arriba-PPI tool. Patients will receive information about long term effects of the medicine, withdrawal plan and follow up appointments.	Na

Appendix C – Paper characteristics for non-intervention studies and commentaries

Study	Type of study	Aim	Population	Themes Identified
Reeve et al. 2018 USA	Survey	Explore the attitudes of older adults towards deprescribing and understand whether clinical & demographic characteristics are associated with this	Medicare beneficiaries 65 years ≤ N = 1981	Majority of older adults willing to have a medicine deprescribed if their doctor said it was possible. Two thirds want to reduce number of medicines they are taking
Gillespie et al. 2019 Australia	Survey	Explore the attitudes regarding polypharmacy & deprescribing among community living older adults taking 5≤ medicines & if health literacy capabilities influences this	Independent older adults 65 years ≤, taking 5≤ medicines N = 187	Older adults with polypharmacy are comfortable with medicines with little concerns however may express interest in stopping medicines. Costs, experiencing side effects or believing medications is unnecessary may result in desire to reduce medicines. Higher health literacy scores associated with involvement in decision making & willingness to stop
Sirois et al. 2017 Canada	Survey	Describe community-dwelling older adults attitudes towards deprescribing	Older adults 65 years ≤ taking 1 ≤ medicines, attending selected	Older individuals within community are eager to undertake deprescribing, especially if taking a large

			community pharmacy/centre N = 129	number of medicines, experiencing side effects or they do not consider medicines necessary anymore
Linsky et al. 2018 USA	Survey	Identify patient characteristics, attitudes and healthcare experiences associated with medicines discontinuation	Veterans taking 5≤ medicines for minimum of 28 days N = 803	Majority disagreed medicines were unimportant or overused but were interested in stopping medicines. 53% recall being told to stop medicine by doctor and 55% reported they had asked their doctor to stop a medicine but 34.1% reported having stopped a medicine. Higher education and prior experience of stopping associated with increased likelihood in stopping. Taking 5≤ medicines, higher trust in PCP and seeing a VA pharmacist in the past year reduced likelihood.
Zhang et al. 2018 Canada	Survey	Determine whether a patient-focused educational intervention to reduce inappropriate medications compromises trust between older adults and their healthcare providers	Adults (65 years ≤) with chronic use (≥ 3 months) of PIMs N = 352	Most participants had no change or increased overall trust in their doctor and pharmacist 6 months after a deprescribing intervention
Linsky et al. 2017	Survey	Determine prescribers preferences for interventions	VA clinical providers with prescribing privileges	Including medicine indication on all Rx was the highest ranked choice to support clinical providers

USA		that would improve their ability to discontinue medicines	N = 411	in discontinuing medicines. This was followed by increased team work monitoring patients post deprescribing and including patients in decision making
Straand and Sandvik 2001 Norway	Survey	Measure the extent of which patients physicians agree upon information communicated when a drug is withdrawn	GPs discontinuing a medicine (3 months use ≤) and the corresponding patient N = 272 doctors and 272 patients	The majority of patients were at least satisfied with the decision to discontinue medicine. Physicians considered it easy to discontinue medicine in majority of cases. There was 100% agreement between physician and patient on which medicine had been stopped. Some patients felt anxious about discontinuing due to being told on medicine initiation that it would be for life
Linsky et al. 2019 USA	Survey	To characterise patients' willingness to accept deprescribing of medicines by different providers	Veterans taking 5≤ medicines N = 803	The most common theme was that patients did not want their primary care provider or pharmacist stopping medicines initiated by a specialist. Patients with greater medicines concerns were more likely to be comfortable with their primary care provider or pharmacist discontinuing specialist initiated medicines
Martin & Tannenbaum 2018	Survey	Develop a prototype of an evidence based pharmaceutical opinion that	Primary care physicians N = 32 Pharmacists	Majority of physicians preferred patient specific information, source of deprescribing advice to be cited and alternates suggested. Pharmacist queried

Canada		promotes physician-pharmacist communication around deprescribing	N = 61	the opinions length and requested space for physician response. A standardised opinion seen as easier to use, more evidence based, time efficient and more likely to lead to deprescribing
Cook et al. 2007 USA	Telephone survey	Identify patients characteristics of long term BZD users to identify likelihood of discontinuation	Patients, 60 years ≤, currently taking anxiolytic BZD (≥ 3 month period N = 46	Higher frequency of daily BZD intake and anxiety sensitivity associated with those less willing to consider BZD taper. Patients with higher education level was not significant on willingness to taper BZD
Gillespie et al. 2018 Australia	Cross-sectional survey	Explore factors that influence GP's attitudes and practices towards deprescribing in community-dwelling older adults	GP's N = 85	GP's recognised the effect of polypharmacy on QoL, but indicated insufficient time to review medicines during consultations. Most GP's agreed they have sufficient information and could explain to patients to guide deprescribing. Most GP's agreed older patients were capable of engaging in decision making about deprescribing yet fewer discussed patients deprescribing preference.
Kua et al. 2019 Malaysia	Cross-sectional survey	Explore the attitudes of older people regarding drug management Explore willingness of older patients to have medication	Adults 60 years≤ or caregivers, visiting primary care health clinic & community pharmacies N = 554	Most older adults satisfied with current treatment regimens Majority willing to reduce one or more medicines if doctors said it was possible

		deprescribed & patients characteristics which could affect this		
White et al. 2019 Australia	Cross-sectional survey	Determine the proportion of GP's who hold attitudes congruent with local pain stewardship, describing their deprescribing decisions and determine whether type of POA influences deprescribing	GPs registered on the Australian primary health network N = 681	77% GP's reported lack of effective alternative treatment would make them less likely to start weaning regime. Patients preference and fear of process or outcome heavily impacts GP's deprescribing decision.
Carrier et al. 2019 France	Cross-sectional survey	Understand GP's attitudes about de/prescribing medicines for patients with multimorbidity and/or polypharmacy and factors associated with their decisions	GP's in private practice N = 1183	91.4% felt at least fairly comfortable deprescribing PIM for patients with multimorbidity but only 34.7% declared doing so often. Majority expressed patients might take deprescribing as abandonment of care
Djatche et al. 2018 Italy	Cross-sectional survey	Determine physician perceptions of deprescribing in elderly patients and assess perceived barriers	Primary care physicians N = 160	Majority confident deprescribing in elderly, in favour of deprescribing preventative medicines in elderly with poor life expectancy, and no difficulty motivating this group to deprescribe. 39% agreed lack of evidence and fear of ADR barrier to deprescribe.

Ng et al. 2017 Singapore	Cross-sectional survey	Elucidate patients attitudes towards number of medicines they were taking and identify factors influencing acceptance to deprescribing	Patients, 45-84 years, receiving treatment for 1< chronic condition, taking 5≤ medicines N = 136	Although majority were comfortable with their medicines, seeing it as a necessity, 93.4% of patients willing to stop a medicine if advised by their doctor. A quarter of respondents felt they were taking a medicine they do not need and 73% had a desire to reduce number of medicines.
Mantelli et al. 2018 Switzerland	Cross-sectional survey	Determine whether, how and why GP's deprescribing in frail old patients with multimorbidity and polypharmacy and identify factors that influence their decision to deprescribe	GPs N = 157	Main factors important when consider deprescribing were risk and benefit of a medication, quality of life and life expectancy of the patient. In the case vignette, majority would deprescribe
Omar et al. 2019 Malaysia	Cross-sectional Survey	Evaluate elderly patients belief and attitude towards deprescribing	Older adults (65 years ≤), with at least one chronic condition, taking long term medicine N = 182	Majority of patients experience at least one practical problem with medicines use. Patients with higher number of medicines considered their medicines a burden. Increase in burden factor, age and number of medicines increased willingness to deprescribe
Turner & Tannenbaum 2017 Canada	Cross-sectional telephone survey	Determine older adults awareness of medicines induced harm and the term deprescribing.	Community dwelling older adults, 65 years ≤, French or English speaking	65.2% were aware some Rx medicines could be harmful and 41.8% reported initiating a deprescribing conversation with healthcare provider but only 6.9% understood the term deprescribing.

			N = 2665	Women and those younger than 80 were more likely to initiate deprescribing conversation
Nixon and Vendelø 2016 Denmark	Semi-structured interviews and observations	Investigate how GP's decision about discontinuation of medicines are influenced by institutional context	GPs N = 24	GP's face ambiguity when considering discontinuation and are reluctant to deprescribe. Reasons are guidelines provide dominating triggers to prescribe, do not encourage discontinuing and they underscore a cognitive constraint against discontinuation.
Eveleigh et al. 2019 Netherlands	Semi-structured interviews	Explore participants barriers and facilitators for stopping long-term antidepressant use without proper indication	Patients using antidepressants (≥9 months) without suitable indication N = 16	Barriers: Attribution, fear and prior attempts. Patients attributed medicine as need, or suffer from chronic condition and so medicine is life-long. Fear associated with relapse of symptoms. Facilitators: information, fear and self-confidence in success. Discussing the limited duration of the medicine was a facilitator, as was fear of addiction and improving patients confidence in success of discontinuation
Middelaar et al. 2018 Netherlands	Semi-structured interview	Explore GPs routines and consideration on de/prescribing antihypertensive medicines in older patients, usability of	GP's N = 15	Some GP's reported increase QoL in patient after deprescribing however fear of adverse drug reactions influenced willingness to deprescribe. The terminal phase was considered rational to deprescribe in but the impression of giving up care

		current guidelines and needs for future support		or depriving patients of a sense of control in BP caused hesitation.
Nixon and Kousgaard 2016 Denmark	Semi-structured interviews and observations	Examine when and how medicines are discontinued in GP and how GP's make decisions regarding this	GPs N = 24	Discontinuation institutionally recommended medicines, such as statins, was rare. Different discontinuation cues crease dissonance that can lead to a GP considering discontinuation. Ambiguity was seen as a reason to act and trial discontinuing. Discontinuation of medicines is more likely to occur when organised proactively.
Korenvain et al. 2020 Canada	Telephone interviews	Explore CP current involvement in deprescribing and identify strategies to enhance this	Pharmacists providing direct patient care in a community pharmacy (≥ 3 hours a week for at least one year) N = 17	Themes: understanding which medicines should be stopped and by whom, influence of access to information on participants' sense of responsibility, and tensions between competing priorities in community pharmacy practice. Recommendations: education to expand pharmacists understanding of deprescribing, contributing to deprescribing despite practice challenges and defining the CP deprescribing role
Turner et al. 2018 Canada	Observations	Describe patterns of deprescribing conversations between patients and healthcare providers when	Patients, 65 years ≤, 1 ≤ active BZD or PPI Rx N = 24	PPI users who received prior education had a higher frequency of patient-initiated deprescribing themes than those who did not. No difference observed in BZD group.

		educational intervention is delivered before/after a primary care encounter		
Luymes et al. 2016 Netherland	Observations	Identify barriers and enablers of deprescribing potentially inappropriate preventative cardiovascular medicine experienced by GP's and patients	Patients with low CVD risk N = 49 GP's N = 10	Patients were positive to deprescribing, relying on GP's expertise to justify decision and follow up, and being able to restart medicine helped. GP's considered additional risk factors and specialist advice on whether to start/stop medicines.
Anderson et al. 2017 Australia	Focus groups	Explore the views of GP's and consultant pharmacists about inappropriate polypharmacy, reasoning for deprescribing in primary care and identify factors that support and inhibit this cognitive process	GP's with primary care experience managing older adults (65 years ≤) with polypharmacy. Consultant pharmacists with experience conducting HMR's N = 47	Themes regarding deprescribing were working through uncertainties and perceived risk as a frame of reference. Inadequate research on older poly-medicated patients adds to uncertainties and deprescribing seen as time intensive process. A gradual taper process and deferring to patients to decide on deprescribing helped to mitigate uncertainty. Deprescribing outcome trajectory seen as a risk. Pharmacists felt lack of knowledge about patient prevents deprescribing.
Linsky et al. 2015 USA	Focus groups	Identify key patient elements that contribute to share clinical	Veterans taking 5≤ medicines N = 27	Majority expressed overall desire to take fewer medicines. Patient provider relationships influenced whether patients trusted clinicians suggestions.

		decisions about intentional medication discontinuation		Some patients prefer shared decision making whereas some are happy for doctor to decide. Limited experience of discontinuation discouraged some patients.
Schuling et al. 2012 Netherlands	Focus Groups	Explore how experienced GPs feel about deprescribing medication in older patients with multimorbidity and to what extent they involve these patients	GP's (5 years' experience ≤) and active as GP trainers, GP trainers with a third-year trainee N = 29	GP's support patient-centred management as best practice. Deprescribing of preventative medicine seen as more difficult due to lack of benefit/risk information for patients. GP's tend to avoid discussing withdrawal of preventative medicines with elderly patients
Bokhof and Walker 2016 Germany	Meta-ethnography	Synthesise qualitative studies exploring the perspectives and experiences of GPs and older patients in reducing polypharmacy and discover approaches being practiced	Qualitative studies, older patients (65 years ≤, multi-morbidity, community dwelling), primary care/GPs, Polypharmacy, Discontinuing/deprescribing medicines N = 14	Patient feel insecure and unprepared to deal with complex medicines regime. Deprescribing decisions seen as not easy, particular with no guidance available. Patients reactions to deprescribing also considered as some patients may value their medicines or see deprescribing as sign of abandonment
Luymes et al. 2017 Netherland	Q-methodology	Identify viewpoints of low risk CVD about preventative	Patients (40-70 years), without established CVD, using potentially	Three main viewpoints. Controlling view point – patients had strong belief in monitoring BP and cholesterol by their GP. Autonomous viewpoint –

		cardiovascular whether they relate to deprescription	inappropriate preventative medicine (≥ 1 year) N = 33	patients showed dislike for medicine. Afraid viewpoint – patients were afraid of developing CVD and were happy to see suitable test results
Clyne et al. 2016 Ireland	Process evaluation	A process evaluation exploring the implementation of the intervention and experiences of participants	General Practices from previous study N = 17 Patients from previous study N = 11	Despite standardised academic detailing, there was variation in implementation delivery. Medicines more likely to be stopped when patient present for reviews.
Van Middelaar 2018 Netherlands	Review Paper	Encourage practicing GP's to consider deprescription as part of their clinical routine	Na	Older population underrepresented in preventative medicine trials. GP's would value organisational support to facilitate deprescribing. A multi-disciplinary approach is an important determinant of deprescribing success.
Duncan et al. 2017 UK	Review Paper	Describe trends in polypharmacy and why, outline harms associated with overtreatment, outline rationale for deprescribing, describe approaches to deprescribing within GP's, make	Na	GP's well positioned to deprescribe but other roles, such as community pharmacists can help. Majority of patients willing to stop at least one medicines. Further research needed ensuring deprescribing maintains or improves health outcomes.

		recommendations for future practice		
Anderson et al. 2015 Australia	Review Paper	Discussing the role of the accredited pharmacist within the context of polypharmacy, deprescribing and shared-decision making	Na	Pharmacist may help to overcome prescriber and patient barriers to deprescribing through collaborative medicine reviews, exploring patient beliefs and providing recommendations but must be integrated within GP practice.
Peterson et al. 2018 Australia	Review Paper	Discussing the opportunity of practice pharmacists to support GPs in deprescribing for older people	Na	Practice pharmacists have clinical data readily available to allow for deprescribing recommendations. They may also enhance relationships with CP, assisting with on going medicines management. There are opportunities for practice pharmacist to improve deprescribing.
Antimisiaris and Cutler 2017 USA	Review Paper	Discussing the need for optimal polypharmacy and strategies on how to achieve this	Na	Thorough medication reconciliation and management should be performed at least annually. PIMs identifying tools may help in identify medicines appropriate on deprescription
Lader et al. 2009 UK	Review Paper	Outline the most relevant studies outline the most relevant studies regarding withdrawing BZD, with assessment on their	Na	Minimal intervention outcomes, consisting of simple advice by letter or consultations were more effective than UC. Method of withdrawal must include tapering, however how to do this is

		effectiveness and feasibility within primary care.		controversial. In general, long term BZD users show improvement when BZD discontinued.
Aguiluz et al. 2018 Chile	Review Paper	Present a strategy based on the best available evidence to address withdrawal of BZD consumption in dependent patients within primary care	Na	Combined techniques including gradual reduction, letters of motivation, standardised counselling, and psychotherapy shown beneficial. Suggested that patients are educated about risks and adverse effects of chronic use on initial prescription.
Farrell et al. 2017 Canada	Evidence based guideline	Develop an evidence-based guideline to help clinician decide when and how to safely deprescribe antihyperglycemic agents in older adults	Patients, 65 years ≤, type 2 diabetes, receiving antihyperglycemic medicines	Guideline recommends deprescribing antihyperglycemic agents known to contribute to hypoglycaemia or in patients experiencing /high risk of adverse effects. Patients should be monitored (blood glucose) daily for 1-2 weeks after each change and educated about hyperglycaemia risk.

Appendix D – Barriers and facilitators to implementing deprescribing (scoping review)

Study & Country	Barriers	Facilitators
Vicen et al. 2014 Spain	-	• GP proposals to the patients for the withdrawal programme lead to most patients participating
Martin et al. 2018 Canada	• Significant number of pharmacies didn't participate due to undisclosed competing priorities • Difficulty recruiting patients taking NSAIDs and antihistamines as this is a OTC medicine and would not reflect in the EMR	• Pre-set computer algorithm allowed for time efficient identification of at risk patients by pharmacists, with 1 simple recommendation for patients
Gompel et al. 2009 Netherlands	• Sufficient personal to accomplish standard tasks • Encouragement of technicians to attend pharmaceutical care classes • Participation in a pharmacy chain or franchise	• Feeling forced by the insurance company to participate in research • Being randomly assigned to experimental group
Zitman & Couvée	• Patients unwilling to take part in the study	-

2001 **Netherlands**		
Kuntz et al. **2019** **USA**	-	• Intervention did not require a large amount of resources • Pharmacists could switch patients to safer sleep medicines, reducing prescriber time and effort
Eveleigh et al. **2018** **Netherlands**	• Majority of patients didn't comply with discontinue recommendation for unknown reasons.	-
Tannenbaum et al. **2014** **Canada**	• Significant number of pharmacies didn't participate due to undisclosed competing priorities. • Physician disagreement of medicine discontinuation recommendations • Community pharmacists were solicited less to discuss BZD therapy discontinuation	-
Clyne et al. **2015**	• Varied intervention delivery between practices caused by organisational factors (e.g. workload and resources)	• Medicine reviews with the patient present • Positive aspirations to improve care

Ireland	• Lack of GP time • Lack of remuneration	• Focusing on a select number of PIPs decreases workload barrier
Luymes et al. 2018 Netherlands	• Difficult to identify medicine use by checking EMRs only	-
Campbell et al. 1999 New Zealand	• Lack of support provided may have led to patients discontinuing the study	-
Prasad et al. 1997 UK	• Patient preference to not withdraw medicine	-
Aylett et al. 1999 UK	• Incomplete data due to non-attendance (problem of practice rather than patient compliance)	-
Anderson et al. 2019 Australia	-	• Intervention did not require greater number of GP appointments or medical reviews by the pharmacist

		• Codesigning of the intervention with GPs encouraged adoption of intervention by GPs
Staand et al. 1993 **Norway**	• Complicated inclusion criteria (allowed for inclusion of patients that should have been excluded)	-
Coyle et al. 2019 **UK**	• Non-attendance to follow-up	-
Duijn et al. 2011 **Netherlands**	• Variation in advice to stop medicine use due to individual nurses and GPs (may not be fully convinced about advantage of stopping)	-
Walsh et al. 2016 **Canada**	• Patient unwillingness to stop PPI • Lack of time • Incorrect EMR use led to the unnecessary reassessment of patients that were not still talking PPI	• Primary care providers performed the reassessment of PPI use as existing relationship and knowledge of patient helped to facilitate efficiency and success • EMR reminder to reassess PPI use was most useful to prescribers • Deprescribing tool helped guide assessment

		• The tools provided guided discussion with patients and implementation of recommendations • Inter-professional project team that engaged the impacted clinicians lead to notable uptake of the project • Having an evidenced based deprescribing tool likely increased PCP's confidence in applying recommendations to patients
Farrell et al. **2019** **Canada**	• Staff turnover and new staff training • Limited understanding of pharmacist role in medication management • Competing workload demands and time • Communication delays/lack of response from healthcare providers • Patients resistant to change • Medicine deliveries or use of multiple pharmacies to dispense medicines	• To build capacity to integrate deprescribing, each pharmacy received individualised support, educational resources, tools and videos • Owner/company buy-in is key to successful implementation • Iterative PDSA cycles improved feasibility • Supportive and motivated staff and students • Onsite educative initiatives • Standard templates to reduce time on pharmaceutical opinions

	• Workspace limitations for deprescribing discussions • Inadequate compensation for time required in deprescribing events	
Odenthal et al. 2020 USA	• Time constraints/pharmacist availability • Patients deviating from taper protocol	-

Appendix E – Search strategy for systematic review

Medline	
#1	deprescriptions/
#2	Inappropriate Prescribing/pc [Prevention & Control]
#3	"Medic* withdrawal".tw.
#4	"Medic* Cessation".tw.
#5	inappropriate* Prescri*.tw.
#6	Deprescrib*.tw.
#7	Inappropriate* medication*.tw
#8	“Treatment withdrawal”.tw.
#9	“Stopping medic*”.tw.
#10	discontin* adj3 (medication* or prescription* or drug*)
#11	Medic* adj2 (Cessation or stop* or withdraw*)
#12	Cessation of medic*.tw
#13	Stopping of medic*.tw
#14	General Practice/
#15	Community Medic*.tw.
#16	Community Health Services/
#17	Primary Care.tw
#18	General Practice.tw.
#19	GP*.tw
#20	General Practitioner*.tw.
#21	Primary Health Care/
#22	Community Dwelling .tw.

#23	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
#24	14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22
#25	23 and 24

Cochrane Search Strategy	
#1	Deprescrib*
#2	MeSH descriptor: [Deprescriptions] explode all trees
#3	medic* cessation
#4	medic* withdrawal
#5	Stopping medic*
#6	inappropriate* Prescri*
#7	Inappropriate* medication*
#8	Treatment withdrawal
#9	discontin* adj3 (medication* or prescription* or drug*)
#10	Medic* adj2 (Cessation or stop* or withdrawal)
#11	Cessation of medic*
#12	Stopping of medic*
#13	MeSH descriptor: [Withholding Treatment] explode all trees
#14	Primary Care
#15	Community Health Cent*
#16	MeSH descriptor: [Community Health Services] explode all trees
#17	Community Medic*
#18	MeSH descriptor: [Community Medicine] explode all trees
#19	MeSH descriptor: [General Practice] explode all trees
#20	General Practice
#21	GP*

#22	General Practitioner*
#23	Barrier*
#24	Obstruc*
#25	Restrict*
#26	Restrain*
#27	Challenge*
#28	Facilitat*
#29	Enabl*
#30	Motivat*
#31	Promot*
#32	Influen*
#33	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13
#34	#14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22
#35	#23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR # 32
#36	#33 AND #34 AND #35
#37	Hospital
#38	Addiction
#39	Drug Abuse
#40	Secondary Care
#41	Withdrawal symptoms
#42	#37 OR #38 OR # 39 or #40
#43	#36 NOT #42

Web of Science	
#1	TS=Deprescrib*

#2	TS=medic* withdrawal
#3	TS=treatment withdrawal
#4	TS=medic* cessation
#5	TS=Drug discontinuation
#6	TS=Stopping Medic*
#7	TS= Deprescriptions
#8	TS=General Practice
#9	TS=Primary Care
#10	TS=community Medic*
#11	TS=Barrier*
#12	TS=Obstruct*
#13	TS=Restrict*
#14	TS=Restrain*
#15	TS=Challenge*
#16	TS=Facilitat*
#17	TS=Enabl*
#18	TS=Motivat*
#19	TS=Promot*
#20	TS=Influen*
#21	7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1
#22	#11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20
#23	TS= GPS*
#24	TS=General Practitioner*
#25	#24 OR #23 OR #10 OR #9 OR #8
#26	#25 AND #22 AND #21

Embase	
#1	Primary Care.tw
#2	Community Medic*.tw.
#3	General Practice.tw.
#4	Community Health Services/
#5	Community Medicine/
#6	General Practice/
#7	GP*.tw
#8	General Practitioner*.tw
#9	Deprescription/
#10	Inappropriate Prescribing/pc [Prevention & Control]
#11	"Medic* cessation".tw.
#12	"Medic* withdrawal".tw.
#13	Inappropriate* Prescri*.tw
#14	Inappropriate* medication*.tw.
#15	Treatment withdrawal.tw.
#16	Stopping Medic*.tw.
#17	Stopping of Medic*.tw
#18	Cessation of Medic*.tw
#19	Deprescrib*.tw.
#20	discontin* adj3 (medication* or prescription* or drug*)
#21	Medic* adj2 (Cessation or stop* or withdraw*)
#22	treatment withdrawal/
#23	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8
#24	9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22
#25	23 and 24

International Pharmaceutical Abstracts	
#1	Deprescrib*.tw.
#2	deprescriptions.tw.
#3	"Medic* withdrawal".tw.
#4	"Medic* cessation".tw.
#5	Stopping medic*.tw.
#6	Stopping of medic*.tw
#7	Cessation of medic*.tw
#8	Inappropriate* Prescri*.tw
#9	Inappropriate* medication*.tw
#10	Treatment withdrawal.tw.
#11	discontin* adj3 (medication* or prescription* or drug*)
#12	Medic* adj2 (Cessation or stop* or withdraw*)
#13	Primary care.tw.
#14	General Practice.tw.
#15	Community medic*.tw.
#16	Primary Health Care.tw.
#17	GP*.tw
#18	General Practitioner*.tw.
#19	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12
#20	13 or 14 or 15 or 16 or 17 or 18
#21	19 and 20

PubMed Search Strategy

#1	(((((General practice[MeSH Terms]) OR Primary Health Care) OR Community Medic*)) AND (((((((Deprescriptions[Mesh]) OR Deprescrib*) OR medic* AND cessation) OR medic* AND Withdrawal) OR Stopping Medic*) OR treatment withdrawal) OR Drug discontinuation) NOT ((((hospital) OR secondary care) OR addiction) OR withdrawal symptoms)

CINAHL	
#1	Deprescrib*
#2	Inappropriate medication
#3	Medic* withdrawal
#4	Medic* cessation
#5	Stopping Medic*
#6	Inappropriate* prescribe*
#7	Stopping of medic*
#8	Cessation of medic*
#9	discontin* adj3 (medication* or prescription* or drug*)
#10	Medic* adj2 (Cessation or stop* or withdraw*)
#11	Treatment withdrawal
#12	General practice
#13	Community medic*
#14	Community health services
#15	Primary care
#16	GP
#17	Primary health care
#18	Community dwelling
#19	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11
#20	12 or 13 or 14 or 15 or 16 or 17 or 18

#21	19 and 20

PsychInfo	
#1	Depresciptions.tw.
#2	"Medic* withdrawal".tw.
#3	"Medic* Cessation".tw.
#4	inappropriate* Prescri*.tw.
#5	Deprescrib*.tw.
#6	Inappropriate* medication*.tw
#7	“Treatment withdrawal”.tw.
#8	“Stopping medic*”.tw.
#9	discontin* adj3 (medication* or prescription* or drug*)
#10	Medic* adj2 (Cessation or stop* or withdraw*)
#11	Cessation of medic*.tw
#12	Stopping of medic*.tw
#13	Primary Health Care/
#14	General practice.tw.
#15	Community medic*.tw.
#16	Community dwelling.tw.
#17	GP*.tw.
#18	General practitioners/
#19	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12
#20	13 or 14 or 15 or 16 or 17 or 18
#21	19 and 20

Appendix F – Data collection form

Study 1 Data Collection Form

Article Details
Article Name:
Authors:
Year:
Country:
Methodology (Quant, Qual, Mixed, Multi):
Study Design:
Study Population:

Barriers and Facilitators
Article focus: General Deprescribing ☐ Deprescribing intervention ☐

Factors that supported deprescribing implementation:

-
-
-
-
-
-

Factors that hindered deprescribing implementation:

-
-
-
-
-
-

Appendix G – Quality appraisal of studies

Author	MMAT Score
Anderson et al 2020	4
Bosman et al 2016	5
Campbell et al 1999	3
Carrier et al 2019	4
Clark et al 2019	2
Cole, Mather and Hull 2020	5
Cook et al 2017	5
Coronado-Vázquez et al 2019	3
Dickinson et al 2010	5
Djatche et al 2018	5
Donald et al 2021	5
Duncan et al 2019	5
Eveleigh et al 2017	2
Gillespie et al 2018	4
Heser et al 2018	5
Jordan et al 2022	5
Keith et al 2013	2
Kennie-Kaulbach et al 2020	5
Korenvain et al 2020	5

Kuntz et al 2019	3
Linsky et al 2017	4
Linsky et al 2019	4
Linksy, Simon and Bokhour et al 2015	5
Lopez-Peig et al 2012	2
López-Sepúlveda et al 2017	2
Luymes et al 2016	5
Luymes et al 2017	2
Luymes et al 2018	1
Magin, Goode, and Pond 2015	5
Mantelli et al 2018	5
Martin and Tannenbaum 2017	5
Martin et al 2018	5
Mulder-Wildemors et al 2020	0
Murie et al 2012	2
Nixon and Kousgaard 2016	4
Nixon and Vendelo 2016	3
Ocampo et al 2015	4

Odenthal, Philbrick, and Harris 2020	1
Rieckert et al 2019	3
Rieckert et al 2020	3
Rognstad et al 2013	2
Schuling et al 2012	4
Stuhec et al 2019	2
Tangiisuran et al 2022	5
Tannenbaum et al 2014	5
Teal et al 2002	1
Thompson et al 2020	3
Turner et al 2018	1
Van De Steeg-van Gompel et al 2009	2
Van der Meer et al 2018	1
Vicens et al 2018	4
Wallis, Andrews, and Henderson 2017	5
White et al 2019	2

Author	QI-MQCS score
Farrell et al 2019	9

Vandenberg et al 2018	10
Walsh et al 2016	13

Appendix H – Study 1 barriers and facilitators mapped onto NPT

Author and title	Barriers (B) and facilitators (F) extracted	NPT application
Anderson, Freeman, Foster, et. al., 2020 GP-Led Deprescribing in Community-Living Older Australians: An Exploratory Controlled Trial	Deprescribing performed by patients' usual GPs whose tacit knowledge and ongoing therapeutic relationship was necessary for engaging patients in deprescribing (F1) Involving GPs in co-designing elements of the intervention encouraged adoption of the intervention by other GPs (F2)	F1 – Cognitive participation (Enrolment) F2 – Cognitive participation (Enrolment)
Bosman, Huijbregts, Verhaak, et. al., 2016 Long-term antidepressant use: a qualitative study on the perspectives of patients and GPs in primary care	Supportive guidance for patients during discontinuation (F1) Discrepancies between patient and GP on ability of GPs to provide supportive guidance (B1) Discrepancies between patient and GP on how to meet perceived need of care (B2) Large variations between practices in patient-GP contact regarding antidepressants (B3)	F1 – Collective action (contextual integration) B1 – Coherence (communal specification) B2 – Coherence (communal specification) B4 – Coherence (communal

	Unawareness of the different expectations of patients and GPs on who is responsible for initiating discussions about antidepressant discontinuation (B4)	specification) and Cognitive Participation (legitimation)
Campbell, Robertson, Gardner, et. al., 1999 Psychotropic Medication Withdrawal and a Home-Based Exercise Program to Prevent Falls: A Randomized, Controlled Trial	Patients would discontinue intervention (medicine withdrawal) at times of stress or sleep disturbances (B1)	
Carrier, Zaytseva, Bocquier, et. al., 2019 GPs' management of polypharmacy and therapeutic dilemma in patients with multimorbidity:	Majority of GPs considered that patients might perceive deprescribing as abandonment of care (B1)	B1 – Coherence (internalisation)

a cross-sectional survey of GPs in France		
Clark, LaValley, Singh, et. al., 2019 A pharmacist-led pilot program to facilitate deprescribing in a primary care clinic	Provider education on proactive deprescribing (F1) Targeting patients most likely to benefit from deprescribing (F2) All parties being involved in the development and implementation of deprescribing intervention (F3) Lack of awareness of all clinic staff to the roles and responsibilities of entire staff (B1) Pharmacist had to physically locate providers to provide deprescribing recommendations (B2) Medicines reconciliation normally performed by nurses who might've been reluctant to relinquish task to pharmacist (B3) Lack of pharmacist access to EMR limited their ability to make	F1 – Coherence (All) F3 – Cognitive participation (enrolment) B1 – Collective action (skill set workability) B2 – Collective action (Interactional workability, contextual integration) B3 – Cognitive participation (initiation) B4 – Collective action (contextual integration)

	deprescribing recommendations (B4) Lack of documentation on patients chart may affecting providers ability to address recommendations (B5) Providers unwilling to attempt deprescribing in situations which patients were not complaining of adverse effects (B6)	B5 – Collective action (contextual integration)
Cole, Mathur, & Hull 2020 Reducing the use of inhaled corticosteroids (ICS) in mild-moderate COPD: an observational study in east London	Provision of clinical guidance and education (F1) Provision EMR reminders for eligible patients (F2) Financial incentives to deprescribe (F3)	F1 – Coherence F2 – Collective action (interactional workability) F3 – Collective action (contextual integration)
Cook, Marshall, Masci et al., 2007 Physicians' Perspectives on Prescribing Benzodiazepines	Lack of discontinuation strategies/alternative treatments available perceived as harsh to patients (B1) Previous experience failing to deprescribe (B2)	B1 – Reflexive Monitoring (communal appraisal)

for Older Adults: A Qualitative Study	Anticipation that patients will resist deprescribing (B3) Limited physician time (B4)	B3 – Cognitive participation (enrolment) B4 – Collective action (contextual integration)
Coronado-Vázquez, Gómez-Salgado, Cerezo-Espinosa de los Monteros et al., 2019 Shared Decision-Making in Chronic Patients with Polypharmacy: An Interventional Study for Assessing Medication Appropriateness	Use of a shared decision-making tool allowed for a greater number of medicines withdrawn (F1)	F1 – Collective action (contextual integration)
Dickinson, Knapp, House et al., 2010 Long-term prescribing of antidepressants in the older population: a qualitative study	Pre-warning patients of the limited duration of prescription (F1) Tapering doses with patient support (F2)	B3 – Coherence (internalisation)

	Timing any discontinuation around springtime (F3) Pessimism – patients felt unable to plan to remove obstacles in life to achieve better condition so accept and internalise their condition seeing medicines as long-term solution (B1) Patient reluctance to discontinue influenced by previous experience withdrawing medicines (B2) Plans to withdraw medicine were seen as threatening to current stable condition with fear of distancing patients (B3) Uncertainty regarding the consequences of long-term anti-depressant use but in the absences of evidence of specific adverse effects there was little concern (B4)	

Djatche, Lee, Singer et al., 2018 How confident are physicians in deprescribing for the elderly and what barriers prevent deprescribing?	Fear of the recurrence of previous conditions or adverse effects (B1) Patient and/or caregiver belief in continuation of medicines (B2) Medicine initially prescribed by another physician (B3) Lack of evidence in discontinuing medications (B4) Lack of time (B5)	B2 – Coherence (internalisation) B3 – Cognitive participation (legitimation) B5 – Collective action (contextual integration)
Donald, Partanen, Sharman et al., 2021 Long-term antidepressant use in general practice: a qualitative study of GPs' views on discontinuation	Reassuring patients that they are not alone in their discontinuation journey (F1) Reflecting on why medicine initially initiated with patient (F2) Strong patient and GP relationship (F3) Use of tools for identifying symptom changes to aid discussions (F4)	F1 – Cognitive participation F2 – Coherence (internalisation) F3 – Cognitive participation F7 – Collective action (all)

	Gradual discontinuing of medicine (F5) Being proactive in relapse planning (F6) Regular reviews during discontinuation (F7) Highlighting limited duration of script on commencement (F8) Decision to deprescribe is complex (B1) Patient reluctance to deprescribing (B2) Poor Patient and GP relationship (B3) Prescribing and repeat prescribing seen as easier than deprescribing (B4) Lack of evidence to support deprescribing (B5)	B2 – Cognitive participation (legitimation) B3 – Cognitive participation B4 – Collective action (Interactional workability B5 – Coherence (all)

Duncan, Cabral, McCahon et al., 2019 Efficiency versus thoroughness in medication review: a qualitative interview study in UK primary care	Deprescribing required patient involvement and generates work so it's easier to continue medicines than stop (B1) Fear of causing problems (B2) Not wanting to stop medicines started by a hospital specialist (B3) Lack of evidence and guidelines on stopping medicines (B4) Patients were reluctant or have no incentive to stop a medicine (B5)	B1 – Collective action (interactional workability) B2 – Collective action (relational integration) B3 – Cognitive participation (legitimation) B5 – Cognitive Participation (enrolment)
Eveleigh, Muskens, Lucassen et al., 2017 Withdrawal of unnecessary antidepressant medication: a randomised controlled trial in primary care	Many patients rejected the deprescribing recommendation or accepted and did not following through (B1) GPs apprehensive to discontinue medicines (B2)	B1 – Cognitive participation (enrolment) B2 – Cognitive participation (enrolment)

Farrell, Clarkin, Conklin et al., 2020 Community pharmacists as catalysts for deprescribing: An exploratory study using quality improvement processes	Deprescribing discussions best initiated in person (F1) Deprescribing had to be conceptualised as part of routine practice rather than extra service (F2) Access to deprescribing resources and supports workload (F3) Enhancing patient's awareness and education regarding risks and options to reassess (F4) Standard templates to reduce time spent on each pharmaceutical opinion (F5) Approaches to draw patients into the pharmacy and having all staff trained for field questions (F6) A lower number of completed medicine reviews than expected (B1)	F3 – Collective action (contextual Integration) F4 – Collective action (contextual Integration) F5 – Collective action (contextual Integration) F6 – Coherence (internalisation) F7 – Collective action (interactional workability) B2 – Cognitive participation (enrolment) B3 – Cognitive participation (initiation)

	Mixed reception to deprescribing by patients (B2) Prescribers unresponsive to deprescription pharmaceutical opinion (B3) Time constraints and competing workload (B4) Limited understanding of pharmacists role in medicine management (B5) Staff turnover and new staff training (B6) Inadequate compensation models for the time required in deprescribing events (B7) Workspace limitations for deprescribing discussions (B8)	B4 – Collective action (contextual integration) B5 – Coherence (communal specification) B7 – Collective action (contextual integration) B8 – Collective action (contextual integration)
Gillespie, Mullan & Harrison 2018 Deprescribing for older adults in	GPs were confident they had enough information on the risks/benefits of medicines use and could explain these to guide deprescribing decisions (F1)	F2 – Collective action (relational integration)

Australia: factors influencing GPs	GPs were confident they could determine when a patient was having difficulty understanding information regarding deprescribing (F2) Conducting medicine reviews by themselves or via pharmacists (F3) Arranging longer consultations (F4) Conducting annual health assessments (F5) Seeking support for deprescribing decisions from others, such as geriatricians or specialists (F6) GPs less certain other prescribers respect deprescribing decisions and communication with other prescribers is poor (B1) Lack of time to review medicines during consultation (B2)	F6 – Collective action (contextual integration) B1 – Collective action (contextual integration) B2 – Collective action (contextual integration)

Heser, Scherer & Loffler et al., 2018 Perspective of elderly patients on chronic use of potentially inappropriate medication - results of the qualitative cim-triad study	Patient resistance against the cessation of the medicine or alternative treatments (B1) Fear of relapse or withdrawal symptoms (B2) Previous failed discontinuation of a medicine (B3) Ageism by patients – different medication-based efforts or alternations we not worthwhile due to their own age or due to impairments (B4) PIM is not rated as problematic medication (B5) Patient does not care about side effects of PIM (B6)	B1 – Cognitive participation (Enrolment) B4 – Coherence (internalisation) and Cognitive participation (Legitimation, enrolment) B5 – Coherence (internalisation) B6 – Coherence (internalisation) and Cognitive participation (Enrolment)
Jordan, Young-Whitford, Mullan et al., 2021 A pharmacist-led intervention to improve the management of	Pharmacist involvement in medicine management (F1) Endorsement of practice-wide policy supported by education, resources and pharmacists (F2)	F1 – Collective action (relational integration) F2 – Collective action (contextual integration)

opioids in a general practice: a qualitative evaluation of participant interviews	Influential individuals to influence practice of others (F3) Engagement of patients through by delivering education (F4) Encouraging a patient-centred approach in medicine management (F5) Ineffective communication regarding intervention specifics (B1)	F3 – Cognitive participation (initiation) F4 – Cognitive participation F5 – Cognitive participation B1 – Coherence
Keith, Maio & Dudash et al., 2013 A Physician-Focused Intervention to Reduce Potentially Inappropriate Medication Prescribing in Older People: A 3-Year, Italian, Prospective, Proof-of-Concept Study	The mixture of educational strategies, including material dissemination, and reminders, group educational outreach and peer-to-peer interactions in combination with a non-punitive approach, was effective in engaging physicians (F1) Characteristics of the list of PIMs may have helped physicians to focus on particular PIMs and overcome barriers and inertia towards following recommendations (F2)	F1 – Cognitive participation (enrolment) F2 – Collective action (interactional workability

	Overall, the whole intervention was effective in improving GPs drug prescribing (F3) The intervention did not place substantial burdens on participating GPs (F4)	
Kennie-Kaulbach, Cormier, Kits et al., 2020 Influencers on deprescribing practice of primary healthcare providers in Nova Scotia: An examination using behavior change frameworks	Use of a systematic process of deprescribing ensured deprescribing is consistent (F1) Patients could be a positive effect due to wanting to be on fewer medicines (F2) Colleagues when they have the same mindset toward deprescribing (F3) Available deprescribing resources (F4) Having prompts built into EMR systems (F5) Access to updated and accurate patient and medication information (F6)	F1 – Collective action (interactional workability) F2 – Cognitive participation (enrolment) F3 – Coherence (communal specification) F4 – Collective action (contextual integration) F5 – Collective action (contextual integration)

	Optimal use of staff e.g. pharmacy technicians in community pharmacy or access to a pharmacist in collaborative practices (F7)	F6 – Collective action (contextual integration)
	Practice standards for routine medicine reviews (F8)	F7 – Collective action (contextual integration)
	Dedicated remuneration for deprescribing would be an incentive (F9)	F9 – Collective action (contextual integration)
	Participants reporting deprescribing is part of their scope of practice (F10)	F10 – Coherence (individual specification) and Cognitive participation (legitimation)
	Building trusting relationships with their patients (F11)	F12 – Coherence (internalisation)
	Belief about consequences of taking medicines and that some medicines may be inappropriate (F12)	B2 – Cognitive participation (enrolment)
	Lack of consistent process for deprescribing (B1)	B3 – Coherence (communal specification)

	Patient attitude as some patients reluctant to accept deprescribing especially for certain medicines or if medication was prescribed by another specialist (B2) Colleagues when they have a different mindset toward deprescribing (B3) Working with multiple prescribers (B4) Inheriting patients with multiple prescriptions (B5) Lack of collaboration between organisations (i.e. lack of communication systems) (B6) Lack of deprescribing tools for younger patients (B7) Pharmacists having a lack of access to updated, accurate patient information limits their ability to support deprescribing (B8)	B8 – Collective action (contextual integration) B9 – Collective action (contextual integration) B10 – Collective action (contextual integration) B11 – Collective action (contextual integration) B12 – Collective action (contextual integration)

	Lack of adequate staffing (B9) Lack of deprescribing workflow (B10) Lack of time, including the limited patient visit time and time required for reviewing medical records and monitoring and follow-up appointments (B11) Lack of reimbursement for pharmacists (B12) Awareness of other prescribers' practice territory and not wanting to step on toes (B13)	
Korenvain, MacKeigana, Dainty et al., 2020 Exploring deprescribing opportunities for community pharmacists using the Behaviour Change Wheel	Medicine expertise to identify PIMs and advise patient to stop (F1) Patient sharing information with pharmacists due to trust in medicine expertise (F2) Adequately compensating pharmacies for deprescribing (F3)	F1 – Coherence F2 – Cognitive participation F3 – Collective action (contextual integration) F4 – Coherence

	Education to expand pharmacists understanding of deprescribing (F4) Contributing to steps in deprescribing process e.g. identifying PIMs of motoring (F5) Define community pharmacists role in deprescribing (F6) Uncertainty on what deprescribing entails (B1) Lack of belief that it's not pharmacist responsibility (B2) Gaps in deprescribing knowledge and available resources (B3) Lack of information regarding medicine use (B4) Competing priorities within community pharmacy (B5) Loss of revenue to community pharmacies (B6)	F5 – Collective action (contextual integration) F6 – Coherence (communal specification) B1 – Coherence (individual specification) B2 – Cognitive participation (legitimation) B3 – Collective action and Cognitive participation B5 – Collective action (interactional workability)

Kuntz, Kouch, Christian et al., 2019 Patient Education and Pharmacist Consultation Influence on Nonbenzodiazepine Sedative Medication Deprescribing Success for Older Adults	Patients receiving deprescribing education materials (F1) Intervention did not require a large amount of resources to implement (F2) Pharmacist able to switch patients to safer medicines where appropriate saving time and effort (F3)	F1 – Coherence (internalisation) and Cognitive participation (legitimation) F2 - Collective action (contextual integration) F3 – Collective action (interactional workability)
Linsky, Meterko, Stolzmann et al., 2017 Supporting medication discontinuation: provider preferences for interventions to facilitate deprescribing	Requiring all medicine prescriptions to have an associated indication for use (F1) Assistance with follow-up of patients as they taper or discontinue medications is performed by another member of the Patient Aligned Care Team (F2) Increased patient involvement in prescribing decisions (F3)	F1 – Collective action (interactional workability) F2 – Collective action (contextual integration)
Linsky, Meterko, Bokhour et al., 2019	Majority of respondents would not want a medicine prescribed by a specialist to be deprescribed	

Deprescribing in the Context of Multiple Providers: Understanding Patient Preferences	by a pharmacist or primary care provider (B1)	
Linsky, Simon, & Bokhour 2015 Patient perceptions of proactive medication discontinuation	Strengthening patient-provider relationships to encourage patients to speak up on their interests to deprescribe (F1) Patient desire to take fewer medicines (F2) Limited patient experience with medicine discontinuation (B1)	F1 – Cognitive participation (initiation) F2 – Cognitive participation (Enrolment)
Lopez-Peig, Mundet, Casabella et al., 2012 Analysis of benzodiazepine withdrawal program managed by primary care nurses in Spain	Nurse provision of education to patients on the risks and benefits of long-term benzodiazepine consumption, side effects, and possible dependence (F1)	F1 – Coherence (internalisation)
López-Sepúlveda, Lirola, García et al., 2017	Provision of education to GPs on proper use of benzodiazepines and Z-drugs (F1)	F1 – Coherence (Internalisation)

Effects of a primary care intervention to improve the quality of zolpidem prescriptions in elderly patients	Individualised feedback on prescribing for GPs (F2) Financial incentive to reduce hazardous prescribing (F3)	F2 – Reflexive monitoring (individual appraisal) F3 – Collective action (contextual integration)
Luymes, van der Kleij, Poortvliet et al., 2016 Deprescribing Potentially Inappropriate Preventive Cardiovascular Medication: Barriers and Enablers for Patients and General Practitioners	Patient knowing follow-up care is available (F1) Patient knowing the medicine can be restarted (F2) GP knowledge that there possibilities to handle side effects (F3) Other support available for patients (family or processes) (F4) Step by step withdrawal of medicine (F5) Lack of fear of deprescribing consequences from GPs (F6)	F1 – Collective action (contextual integration) F3 – Collective action (relational integration) F6 – Collective action (relational integration) F7 – Collective action (contextual integration B1 – Collective action (contextual integration)

	Deprescribing consultations not necessarily time consuming (F7) Patient-centred discussion (F8) Lack of primary care physician support/time (B1) Unknown how to cease/conflicting information (B2) Need for appropriate timing for cessation (B3) Patient fear associated with return of condition or withdrawal effects (B4) Previous bad experience with stopping medicine (B5)	B2 – Coherence (individual specification)
Luymes, Boelhouwer, Poortvliet et al., 2017 Understanding deprescribing of preventive cardiovascular	Start deprescribing implementation with patients with an autonomous view point – these are patients that know a lot about medication and healthy lifestyles, little fear for cardiovascular disease and negative toward medication use (F1)	

medication: A Q-methodology study in patients		
Luymes, Poortvliet, Geloven et al., 2018 Deprescribing preventive cardiovascular medication in patients with predicted low cardiovascular disease risk in general practice – the ECSTATIC study: a cluster randomised non-inferiority trial	Continuous monitoring of patients' blood pressure and cholesterol during and after stopping medicine (F1) Unexplained low adherence to deprescribing recommendation by patients (B1)	F1 – Collective action (contextual integration) B1 – Cognitive participation (activation)
Magin, Goode, & Pond 2015 GPs, medications and older people: A qualitative study of general practitioners' approaches to potentially inappropriate	GPs felt it was difficult to stop a medicine prescribed by a specialist (B1) Perceived clinical problems in medicine cessation e.g. difficulty deprescribing benzodiazepines (B2)	B1 – Cognitive participation (legitimation)

medications in older people		
Mantelli, Jungo, Rozsnyai et al., 2018 How general practitioners would deprescribe in frail oldest-old with polypharmacy — the LESS study	High willingness to deprescribe preventative cardiovascular disease medicine by GPs (F) When considering deprescribing, expenditure of time for deprescribing and self-dispensation of medicines in GP office were considered less important (F)	F1 – Cognitive participation (Enrolment)
Martin & Tannenbaum 2017 A realist evaluation of patients' decisions to deprescribe in the EMPOWER trial	Provision of new knowledge on medicine harms improving patient motivation and intent to deprescribe (F1) Use of a tapering tool (F2) Stable patient health status (F3) Support or encouragement from a healthcare provider (F4) Certainty and confidence about tapering (postintervention) (F5) Patient positive outlook on ageing (F6)	F1 – Coherence (Internalisation) and Cognitive participation (Enrolment) F2 – Collective action (interactional workability, contextual integration) F4 – Cognitive participation (Initiation)

	Increased patient self-efficacy to reduce medicine (F7) Reduced patient belief in the necessity of benzodiazepines (F8) Increased patient concerns about taking benzodiazepines (F9) High concerns (including greater perception of risk (F10) Lack of support from HCP including undermining of attempt to deprescribe (B1) Being in poor health (B2) Previous reassurance about the safety of benzodiazepines (B3) Psychological attachment to medicine (B4) Loss of confidence to complete the tapering process (B5)	F5 – Collective action (relational integration) F7 – Cognitive participation (legitimation) B1 – Cognitive participation (Initiation) B3 – Coherence (differentiation, internalisation) B5 – collective action (relational integration) B7 – Coherence (internalisation)

	Intolerance to recurrence of symptoms/withdrawal effects (B6) Lack of perception of personal risk (B7) Unquestioning patient belief in their physician (B8)	
Martin, Philippe, Tamblyn et al., 2018 Effect of a Pharmacist-Led Educational Intervention on Inappropriate Medication Prescriptions in Older Adults: The D-PRESCRIBE Randomized Clinical Trial	Pre-set computer algorithms allowing for time efficient identification of at-risk patients with one simple recommendations (F1) Educational brochure leading to initiation of deprescribing conversation with doctor (F2) Pharmacist providing pharmaceutical opinion on deprescribing (F3) Pharmacist-led educational intervention (F4) Pharmacist exposure to the evidenced-based template (F5)	F1 – Collective action (Interactional workability) F2 – Cognitive participation (enrolment) F3 – Cognitive participation (Initiation) F5 – Collective action (Interactional workability)

	Provision of financial incentives for pharmacists (F6) Significant number of pharmacies excluded due to competing priorities or not interested (B1) Intolerance to ADWE (B2) Lack of concerns of harms of medicine (B3) Medicine dependence (B4) HCP discouragement for initiating tapering (B5) Patient comfortable with taking small dose (B6)	F6 – Collective action (contextual integration) B1 – Cognitive Participation (Enrolment) B3 – Coherence (Internalisation) B5 – Cognitive participation (initiation)
Mulder-Wildemors, Heringa, Floor-Schreudering et al., 2020 Reducing Inappropriate Drug Use in Older	Good relationship between pharmacist and GP (F1) Good accessibility of the prescriber (F2) Prior agreement on the clinical decision rules (F3)	F1 – Coherence (differentiation, individual specification, internalisation)

Patients by Use of Clinical Decision Support in Community Pharmacy: A Mixed-Methods Evaluation	Patient trusts pharmacists and/or GP (F4)	F3 – Collective action (contextual integration)
	Agreement of the healthcare professional with the PIM guideline underlying the clinical decision rule (F5)	F4 – Collective action (contextual integration)
	Medicine alert not relevant as medicine being used for different indication (B1)	F5 – Cognitive participation (legitimation, enrolment, initiation)
	Prescriber being a specialist and not a GP (B2)	B2 – Cognitive participation (legitimation)
	Lack of collaboration between pharmacist and GP (B3)	B3 – Cognitive Participation (initiation)
	Lack of time (B4)	B4 – Collective action (contextual integration)
	Patient anxious about medicine changes (B5)	B8 – Collective action
	Patient used to current medicine (B6)	

	Presence of many prescribers and prescribers who had not previously been receptive to pharmacists advice (B7) Difficulty integrating clinical decision rules into current workflow (B8)	(interactional workability
Murie, Allen, Simmonds et al., 2012 Glad you brought it up: a patient-centred programme to reduce proton-pump inhibitor prescribing in general medical practice	Provision of formal patient education on patients' conditions, therapeutic management options and potential lifestyle modifications (F1) Empowering patients to self-manage their symptoms with alginates (F2) Use of at least one face-to-face follow-up appointment within 3 months (F3) The availability of flexible support offered to patients during the initial vulnerable period (F4) Involving patients with a patient centred approach (F5)	F1 – Coherence (differentiation, individual specification, internalisation) F3 – Collective action (contextual integration) F4 – Collective action (contextual integration) F5 – Cognitive Participation (legitimation, enrolment, initiation)

Nixon & Kousgaard 2016 Organising medication discontinuation: a qualitative study exploring the views of general practitioners toward discontinuing statins	Discontinuation conversations happened more often in certain situations e.g. check-up consultations or consultations with new patients (F1) Patient based or record based cues for medicine discontinuation (F2) GP proactively identifying patient's medicine needs and examining the necessity of new prescriptions (F3) Patient being present for scheduled medicine check-ups (F4) Use of a risk score tool to reduce ambiguity around deprescribing (F5) Ambiguity seen as reason to trial discontinuation (F6) Trialling discontinuation rather than committing to the process indefinitely (F7)	F3 – Cognitive participation (initiation) F5 – Collective action (contextual integration and interactional workability) B3 – Cognitive participation (activation or initiation) B5 – Cognitive participation (Initiation) B7 – Coherence (all constructs)

	Discontinuing medicine is more likely to occur when organised proactively, rather than reactively (F8) Eliciting patients experiences with taking medicines (patient-based cues) (F9) Discontinuing of medicine perceived as not a very organised practice (B1) Routine of prescribing is strong meaning a lot of effort needed to raise the possibility of stopping a medicine (B2) GP forget to mention about discontinuing medicine, especially if patient doesn't mention it (B3) GPs found it difficult to find the right time to discuss stopping a medicine (B4)	

	Lack of proactively inviting patients for check-ups makes it harder to identify and monitor patients who would benefit from medicine discontinuation (B5) Renewal of repeat prescriptions without the patient knowing (B6) Lack of agreement and conflicting information about when to prescribe or deprescribe (B7) Ambiguity seen as reason to continue treatment (B8)	
Nixon & Vendelø 2016 General practitioners' decisions about discontinuation of medication: an explorative study	Institutional Dominating triggers in the form of a prescribing imperative (B1) Clinical guidelines focus GP attention on patient risks and possible treatments rather than patient experience and possibility of discontinuation (B2) Clinical guidelines only suggest discontinuation in the most obvious cases (B3)	B1 – Collective action (contextual integration) B2 – Collective action (contextual integration) B3 – Collective action (contextual integration)

	GPs unaware of deprescribing cue so not guided towards an alternative to the prescription imperative (B4) Difficulty justifying deprescribing in the face of ambiguity (B5)	B4 – Collective action (skill set workability)
Ocampo, Garcia-Cardenas, Martinez-Martinez et al., 2015 Implementation of medication review with follow-up in a Spanish community pharmacy and its achieved outcomes	Provision of medicine review with follow up allowed for deprescribing problematic medicine (F1) Intervention focused on patient outcomes rather than medicine use (F2)	
Odenthal, Philbrick, Harris 2020 Successful deprescribing of unnecessary proton pump inhibitors in a primary care clinic	Pharmacists seeing each patient (F1) Pharmacist providing education on ADRs and why to taper (F2) Pharmacist providing written tapering protocol (F3)	F1 – Cognitive participation F2 – Coherence (Internalisation) B1 – Collective action (contextual integration)

	Pharmacist calling patients for a follow up (F4) Lack of staff availability (B1) Time constraints (B2) Other appointment priorities (B3)	B2 – Collective action (contextual integration)
Rieckert, Teichmann, Drewelow et al., 2019 Reduction of inappropriate medication in older populations by electronic decision support (the PRIMA-eDS project): a survey of general practitioners' experiences	Discussing discontinuation recommendation with the patient (patient involvement) (F1) Perceived necessity of the medicine for the GP (B1) Prior trial of suggested alternative medicine (B2) Specialist being involved in prescribing the medicine (B3) The perceived deviation from standard therapy (B4) Time requirements to perform comprehensive medicine review for UK GPs (B5)	F1 – Cognitive participation (All) B3 – Cognitive participation (Legitimation) B4 – Coherence (differentiation) B5 – Collective action (contextual integration) B7 – Collective action (interactional workability)

	GPs deem recommendations as unpracticable (B6) The effort required to make changes to medicines (B7)	
Rieckert, Reeves, Altiner et al., 2020 Use of an electronic decision support tool to reduce polypharmacy in elderly people with chronic diseases: cluster randomised controlled trial	Use of an electronic decision support tool for comprehensive medicine review (F1) The electronic support tool not always being used as intended (B2)	F1 – Collective action (contextual integration, interactional workability) B1 – Reflexive monitoring (reconfiguration)
Rognstad, Brekke, Fetveit et al., 2013 Prescription peer academic detailing to reduce inappropriate prescribing for older patients: a cluster randomised controlled trial	Use of a multifaceted educational intervention focused on teaching GPs on PIPs (F1) Use of a GP to teach other GPs possible positively affected participation and perception of relevance of the intervention (F2)	F1 – Coherence (all) F2 – Cognitive participation (all)
Schuling, Gebben, Veehof et al., 2012	Taking a positive approach to stopping preventative medicine (F1)	F1 – Cognitive participation (enrolment)

Deprescribing medication in very elderly patients with multimorbidity: the view of Dutch GPs. A qualitative study	Lack of benefit/risk information concerning deprescribing preventative medicines (B1) Lack of evidence of the effects of preventative medicine in the very elderly (B2) Lack confidence communicating risk and information not helpful for shared decision making (B3) GPs consider patients to have no problem with polypharmacy or medicine burden (B4) GPs unaware of patient treatment goals and preferences (B5) Patients appear to cling to their extensive medicine list (B6) In the GPs view, patients underreport ADE's so difficult to be aware of issues (B7)	B1 – Coherence B2 – Coherence B3 – Collective action (relational integration, skill set workability) B4 – Cognitive participation B6 – Coherence (internalisation) B8 – Cognitive participation and Collective action (initiation and internalisation) B9 – Collective action (contextual integration) B10 – Collective action (contextual integration)

	GPs reluctant to initiate deprescribing discussion because fear this may be interpreted as a sign of giving up (B8) GPs feel forced by current guidelines to prescribe many different medicines (B9) GPs feel guilty if they are not adherent to guidelines (B10) Inadequate overview of new patients' medicines (B11)	
Stuhec, Gorenc & Zelko 2019 Evaluation of a collaborative care approach between general practitioners and clinical pharmacists in primary care community settings in elderly patients on polypharmacy in Slovenia: a cohort retrospective study reveals positive	Use of a clinical pharmacist to provide medicine reviews and recommendations to GP (F1)	F1 – Collective action (skill set workability)

evidence for implementation		
Tangiisuran, Rajendran, Sha'aban et al., 2022 Physicians' perceived barriers and enablers for deprescribing among older patients at public primary care clinics: a qualitative study	Conducting medicine reviews regularly (F1) Effect patient-physician communication (F2) Availability of empirical evidence to guide deprescribing (F3) Pharmacist provision of information to patients (F4) Involvement of pharmacists in multiple areas of medicines management (F5) Fear of litigation (B1) Fear of clinical consequences (B2) Lack of confidence (B3) Lack of time (B4)	F2 – Cognitive participation F3 – Coherence F4 – Collective action (skill set workability) F5 – Collective action (skill set workability) B3 – Collective action (relational integration) B4 – Collective action (relational integration) B5 – Collective action B6 – Coherence (internalisation)

	Fragmented care (B5) Patient belief in continuation of medicine (B6)	
Tannenbaum, Martin, Tamblyn et al., 2014 Reduction of Inappropriate Benzodiazepine Prescriptions Among Older Adults Through Direct Patient Education The EMPOWER Cluster Randomized Trial	Direct-to-consumer education promoting patient buy-in for discontinuation at an early stage (F1) Patient empowerment to initiate deprescribing conversation (F2) Physician discouraged benzodiazepine deprescribing due to perceived absence of benzodiazepine side effects (B1) Substitution of deprescribed medicine with equally harmful drug (B2) Patient fear of withdrawal symptoms (B3) Lack of patient concern regarding benzodiazepine consumption (B4)	F1 – Cognitive participation (enrolment) F2 – Cognitive participation (initiation, legitimation, enrolment) B1 – Coherence & cognitive participation (internalisation, initiation) B4 – Coherence (internalisation) B5 – Cognitive participation (enrolment)

	Common reasons for nonparticipation of community pharmacists was lack of interest in participating and competing priorities (B5)	
Teal, Ricketts, Belton et al., 2002 How effective are pharmacists who work with medical practitioners? A study of interventions intended to influence prescribing	Incorporation of a pharmacist into GP actions: audit, individual patient review via paper or face to face interview, patient letters, therapeutic review, protocol development and implementation, patient information packs, specific clinics and prescriber education (F1) Pharmacists provided better identification of PIMs and medicine duplication/compliance issues (F2) GPs happy to make dose changes and review patients (F3) Pharmacist interventions led to additional reviews that would have increased GP workload (B1) GPs less willing to discontinue sedative medicine (B2)	F1 – Collective action (skill set workability) F2 – Collective action (skill set workability) B1 – Collective action (contextual integration, interactional workability)

Thompson, Le, Haastrup et al., 2020 Exploring how GPs discuss statin deprescribing with older people: a qualitative study	GP initiating deprescribing conversation when reviewing medicines (F1) Patient related ques to initiate conversation e.g. patient taking many meds or trouble swallowing (F2) Discussing lack of evidence for medicine continuation for eldest adults (F3) GP unlikely to initiate conversation if patient fit and healthy (B1) Uncertainty regarding the effect of taking action vs not taking action (B2)	F1 – Cognitive participation (initiation) F3 – Coherence (internalisation) B1 – Cognitive participation (initiation) B2 – Collective action and reflexive monitoring (relational integration, communal appraisal)
Turner, Richard, Lussier et al., 2018 Deprescribing conversations: a closer look at prescriber–patient communication	Greater proportion of conversation themes initiated by PPI patients when they received prior PPI education (F1) Higher proportion of conversations were dialogue (rather than healthcare professional monologue) for PPI	F1 – Cognitive participation (enrolment, legitimation) F2 – Cognitive participation (enrolment, legitimation)

	patients that received education (F2)	
Van de Steeg-van Gompel, Wensing & De Smet 2009 Implementation of a discontinuation letter to reduce long-term benzodiazepine use—A cluster randomized trial	Feeling forced by the health insurance to participate in the study (F1) Participation in a pharmacy chain (B1) Prior focus on benzodiazepine use by the pharmacy (B2) Sufficient personnel to accomplish standard task (B3) Encouragement of technicians to attend pharmaceutical care classes (B4)	F1 – Cognitive participation (initiation)
Van der Meer, Wouters, Teichert et al., 2018 Feasibility, acceptability and potential effectiveness of an information technology-based, pharmacist-led intervention to	Pharmacists able to identify a considerable number of older patients in need of medicine optimisation with the IT based tool (F1) Intervention tool (IT Based) seen as meaningful, practical, clear and educational (F2)	F1 - Collective action (Interactional workability) F4 – Collective action (interactional integration)

prevent an increase in anticholinergic and sedative load among older community-dwelling individuals	Targeting newly initiated anticholinergic/sedative medicines (F3) Intervention designed for the convenience of the pharmacist who could adapt as they see fit (F4)	
Vandenberg, Echt, Kemp et al., 2018 Academic Detailing with Provider Audit and Feedback Improve Prescribing Quality for Older Veterans	Pharmacist and patient-aligned care teams seen as valued clinic resources that could facilitate intervention (F1) Education to PCP's and pharmacists raising awareness of PIMS (F2) Provision of patient education material (F3) Individualised audit and prescribing feedback (F4) Patients referred to pharmacist for structured medicine reviews (F5) Incomplete medicine lists (B1)	F1 – Collective action (contextual integration) F2 – Coherence (internalisation) F3 – Coherence (internalisation) F5 – Collective action (skill set workability) B2 – Cognitive participation (legitimation) B5 – Collective action (contextual integration)

	Hesitancy to discontinue medicines started by a specialist (B2) Absence of routine pharmacy review (B3) Low awareness of tools to improve safe prescribing (B4) Time investment needed for a comprehensive medicine review and education (B5)	
Vicens, Bejarano, Sempere et al., 2018 Comparative efficacy of two interventions to discontinue long-term benzodiazepine use: cluster randomised controlled trial in primary care	GP proposal of deprescribing to patients (F) Structured education and training on benzodiazepine deprescribing (F)	F1 – Cognitive participation (Initiation) F2 – Coherence (all)
Wallis, Andrews, & Henderson 2017	Only incentive to deprescribe is the duty to do what is right – beneficence (F1)	F2 – Collective action

Swimming Against the Tide: Primary Care Physicians' Views on Deprescribing in Everyday Practice	Computer alerts to prompt physician memories (F2) Targeted funding for annual medicine reviews (F3) Computer systems to improve information sharing between prescribers (F4) Improved access to non-pharmaceutical therapies (F5) Education and training (F6) Ready access to expert advice and user-friendly decision support (F7) Updating guidelines to include advice on when to consider deprescribing (F8) Guidelines for management of common co-morbidities (F9)	(interactional workability) F3 – Collective action (contextual integration) F4 – Collective action (contextual integration) F6 – Coherence F7 – Collective action (contextual integration) F8 – Collective action (contextual integration) F9 – Collective action (contextual integration) F10 – Collective action – (contextual integration)

	Tools and resources to assist in communicating risks to patients (F10) Activating patients to become more involved in medicine management and alert to the possibility that less might be better (F11) Patient expectations “Pill for every ill” (B1) Medical culture of prescribing (B2) Prescribing seen as easy option whilst deprescribing is time consuming (B3) Uncertainty around which medicines patients are taking and why because of poor information sharing (B4) Uncertainty and lack of evidence regarding best prescribing practices (B5)	F11 – Cognitive participation (enrolment, legitimation) B1 – Coherence (internalisation, differentiation) B3 – Collective action (interactional workability and contextual integration) B4 – Collective action (contextual integration) B5 – Collective action (contextual integration) B7 – Coherence (internalisation)

	Uncertainty lead to fear of preventable adverse outcomes following deprescribing (B6) Fear deprescribing seen as sign of abandonment and money saving exercise (B7) Professional etiquette leaving physicians reluctant to stop medicines initiated by others (B8) Fast pace and competing demands of practice (B) Fragmentation of care and poor flow of information (B) Single disease specific guidelines promote prescribing not deprescribing (B)	B8 – Cognitive participation (legitimation) B9 – Collective action (contextual integration) B10 – Collective action (contextual integration) B11 – Collective action (contextual integration)
Walsh, Kwan, Marr et al., 2016 Deprescribing in a family health team: a study of chronic proton pump inhibitor use	EMR reminders that an upcoming appointment would be an opportunity to reassess therapy (F1) PPI deprescribing tool in the EMR to as a reminder during the appointment and to support	F1 – Collective action (interactional workability) F2 – Collective action

	reassessment and deprescribing and the tapering (F2) Deprescribing tool helped guide discussions with patients and implement recommendations (F3) Tool helped guide reassessment of medicines and taper process (F4) Lack of time (B1) Patient unwillingness to stop PPI (B2)	(interactional workability) F3 – Collective action (interactional workability) F4 – Collective action (interactional workability) B1 – Collective action (contextual integration) B2 – Cognitive participation (enrolment)
White, Hayes, Boyes et al., 2019 General practitioners and management of chronic noncancer pain: a cross-sectional survey of	Patient having poor psychological health (F1) Ongoing requests for opioids (F2) Lack of therapeutic response to opioids (F3)	

influences on opioid deprescribing	Lack of effective alternate treatment would make them less likely to deprescribe (B1) Patient preference to stay on opioid or fear of the process or outcome of weaning (B2)	

Appendix I – Ethical considerations highlighted in REC review and responses

	Ethical Review - Further Information required	**Response from the applicant**
1	Amend the study documentation to make clear to participants that there was limited confidentiality within a group setting and participants would be asked not to share any information discussed within the focus group outside of the group. Ensure that this information is also addressed in the briefing at the start and end of each focus group. Amend the wording in the PIS to highlight that confidentiality was limited as there would be other patients and facilitator(s) in the group and a warning that there was a risk that sensitive information may be shared by other participants. Amend the consent forms by adding the following statement: I agree not to disclose information discussed within the focus group/interview to anyone outside of the focus group/interview'.	• Added to 6. in Patient and Professional consent forms: I agree not to disclose information discussed during the focus group/interview to anyone outside of the focus group/interview • Added to patient PIS: "Confidentiality within the focus group is limited as there will be other participants and researchers present … There is a risk that sensitive information may be shared by other participants. You must not share what has been said in the focus group or interview with anyone outside of the focus group or interview" • Added to professional PIS: "Confidentiality within the focus group is limited as there will be other participants and researchers present. What is said within the focus group / interview will be treated as confidential and the data will be anonymised … There is a risk that sensitive information may be shared by other participants. You must not share what has been said in the focus group or interview with anyone outside of the focus group or interview". • Added to 8. in protocol: Confidentiality within focus groups will be limited as there will be other patients and

		facilitators present. There is also a risk of sensitive information being shared by participants. This will be communicated to participants who must agree to not disclose information discussed in the focus group/interview with others outside the focus group/interview.
2	Amend the protocol and PIS to add the following information provided by the applicants in response to the PR committee requests: a step-by-step guide on how to join Microsoft Teams meetings using different devices including a landline or mobile telephone would be shared. If participants did not feel confident using Microsoft Teams, Mr Daniel Okeowo would organise a 'trial run' meeting where he could test if participants could join the meeting, speak and be heard, and leave the meeting without any technical difficulties. If participants needed someone by them for IT support, they must agree to and would be bound to the confidentiality rules as set up in the consent form. Submit the revised documentation for review.	• Added to 8. in protocol: As this study is facilitated online with the use of Microsoft Teams, IT support will be offered for participants. Once participants have registered onto the study and provided consent, Daniel Okeowo will share a step-by-step guide on how to join Microsoft Teams meetings using different devices including a landline or mobile telephone. This information will be generated from the Microsoft Teams support page (https://support.microsoft.com/en-us/office/join-a-meeting-in-teams-1613bb53-f3fa-431e-85a9-d6a91e3468c9#ID0EAABAAA=Desktop). If participants do not feel confident using Microsoft Teams, Daniel Okeowo will organise a 'trial run' meeting where he will test if participants can join the meeting, speak and be heard, and leave the meeting without any technical difficulties. If participants need someone by them during focus groups/interviews for IT support, this can be accommodated however this said person must agree to and will be bound to the confidentiality rules as set up in the consent form.

		• Added to patient PIS: Once you have provided consent to this study, we will let you know how to join the focus group and support you with this. If you need someone with you during the focus group or interview, for example, to provide computer support, then that is okay but they will need to agree not to share anything they hear. • Added to Professional PIS: Once you have provided consent to this study, we will let you know how to join the focus group and support you with this.
3	Amend the PIS, protocol and consent forms accordingly to reflect the information provided by the applicants in response to the PR committee: clarify that only the audio recordings of the groups/interview would be shared with the transcription company. No other personal identifiable data would be shared with the transcription company. Clear wording would be included in the PISs that 'Audio of the focus group/interview will be securely sent to the transcription service using their secure file upload system'. Information to the PIs would state 'We will ensure that transcripts are	• Added to 8.6 in protocol: Audio of the focus group/interview needed for transcription will be securely sent to the transcription service using their own secure file upload system. No other personal identifiable data will be shared with the transcription company. Transcripts will be fully anonymised. The transcription protocol will mandate anonymisation at the source, for example any name or local details mentioned by participants during interviews/focus groups will be replaced during transcription with codes. Anonymisation will then be checked by Daniel Okeowo. Participants will be briefed prior to the start of the focus groups to only use first names and to avoid saying their own or other participant's surnames • Added to 3. in patient and professional consent forms: I agree for my focus

	anonymised'. The transcription protocol would mandate anonymisation at the source, for example any name or local details mentioned by participants during interviews/focus groups would be replaced during transcription with codes. Anonymisation would then be checked by Mr Okeowo. Participants would be briefed prior to the start of the focus groups to only use first names and to avoid saying their own or other participant's surnames. Submit the amended documents for review.	group/interview to be audio or video recorded, for the audio to be transcribed by a transcription service company • <u>Added to patient & professional PIS</u>: The audio of the focus groups/interviews will be securely sent to a university approved company to be written up, using their secure file upload system. No other personal identifiable data or contact details will be shared with the transcription company … We will ensure transcripts are anonymised
4	Amend the protocol and PIS to include the information provided by the applicants in response to the PR committee: participants could take and send a picture of their consent form (using their mobile phone), that showed all 4 corners of the document and all text could be read from the picture, that would be accepted. Verbal consent would be taken if that was not possible and as consent was an ongoing process, Mr Okeowo would go through the items on the	• <u>Added to 7.3.2 in protocol:</u> Participants may take and send a picture of their consent forms (e.g. using their mobile phone) and return this providing all 4 corners of the document and all texts can be read from the picture … As consent is an ongoing process, Daniel Okeowo will go through the items on the consent form during the briefing prior to the focus group commencing to ensure informed, consent is still valid. • <u>Added to patient & professional PIS</u>: You may also take and send a picture of the signed consent form (e.g. using a mobile phone) providing all four corners of the

	consent form during the briefing prior to the focus group commencing to ensure informed, consent was still valid. Submit the amended protocol and PIS for review.	document can be seen and the text can be read from the photo.
5	Provide clarification in the protocol and PISs with regards to conducting a telephone interview if participants did not have a suitable device for accessing Microsoft Teams. Submit the revised documents for review.	• Added to 5. In protocol: If participants do not have access to the necessary IT equipment to join an online focus group or interview, i.e. computer with Internet access or mobile phone, or would prefer a telephone interview, this can be requested once consent has been taken. • Added to patient & Professional PIS: If you would prefer a one-to-one online interview or a telephone interview, then please contact Daniel Okeowo (details below) so that can be arranged
6	Provide further information as to the process of assessing capacity to consent in the protocol and submit for review.	• Added to 7.3.2 in protocol: Daniel Okeowo will assess participants' capacity to consent through their ability to understand, retain and respond to the information provided within the PIS. Daniel Okeowo has attended the Introduction to Research Ethics training which includes capacity to consent, provided by University of Leeds. Daniel Okeowo has previous professional experience of interacting with older patients with and without capacity through his role as a registered pharmacist and has completed the Safeguarding children and vulnerable adults: Level 1 & 2 training by The

		Centre for Pharmacy Postgraduate Education (CPPE). Daniel Okeowo will use the HRA best practice on informing participants and seeking consent and the principles within the Mental Capacity Act 2005 as guidance in assessing capacity (https://www.hra.nhs.uk/planning-and-improving-research/best-practice/informing-participants-and-seeking-consent/ & https://www.hra.nhs.uk/planning-and-improving-research/policies-standards-legislation/mental-capacity-act/). As defined in the Mental Capacity Act 2005, we will ensure it is clear that all participants are able to do the following before consent is accepted: • understand the information relevant to consenting for this study • retain the information • use or weigh the information • communicate his or her decision As consent is an ongoing process, Daniel Okeowo will go through the items on the consent form during the briefing prior to the focus group commencing to ensure informed, consent is still valid.
7	Provide clearer information with regards to facilitating; managing discussions; risks and safeguards for conducting online interviews/focus groups in	• Added to 5. In protocol: Where two facilitators are present within a focus group, the first facilitator (Daniel Okeowo) will set the ground rules, ask questions to participants and round up/thank participants at the end of the

	the protocol and PISs. The revised documents should be submitted for review. *Need for 2nd facilitator due to lack of experience*	session. The second facilitator will help to bring in participants who wish to speak whilst keeping an eye on the "hand up function" and chat box within MS teams to help organise discussions. Although both facilitators share this responsibility, the second facilitator will be looking out for anyone who is uncomfortable or signs of participants being upset and distressed. If this occurs, a break will be introduced, and we will contact that individual privately to discuss and make a decision as to whether to continue with the discussion or not. Where only one facilitator is present e.g. one-to-one interview, they will manage all these responsibilities. • Although we value the recommendation to include more details regarding facilitation within the PIS, in order not to overburden the participants with information, this information will be included in the focus group briefing.
8	Provide clearer information in the protocol regarding the debriefing process should the researcher experience difficulties during the focus group.	• <u>Added to 8.1 in protocol:</u> Should the researcher experience difficulties during the focus group or interviews, there will be an opportunity to debrief this experience with the academic supervisors immediately afterwards. At least one supervisor will ensure they are available immediately following focus groups or interviews. This will allow for the researcher to discuss any problems or difficulties they have encountered and

		for the academic supervisors to identify any necessary follow-up action.
9	Provide a rationale for not informing GP's about their patient taking part in the study	This qualitative research study does not involve making any recommendations or changes to participants' treatment or care, and in particular, we will not be making any recommendations on patients' medicines. We will not know who the participant's GPs are, particularly those we recruit through social media and patient groups and we feel it would be intrusive and unnecessary to collect this data and inform their GPs. If participants express a desire to discontinue their medicines, they will be advised to speak to their GP about this as per normal systems. Consequently , we do not deem it necessary or appropriate to inform participants GP's about their taking part.
10	Provide written clarification as to whether participants could still take part in the focus group/interviews if they did not consent to audio/video recording of the session, as stated in No.3 on the consent form	Participants will not be able to take part in the study if they do not consent to audio/video recordings as this is needed for data analysis. • Added to professional PIS: You will not be able to participate in this research if you do not consent to audio/video recordings of the interview/focus group. This is because these recordings are needed to analyse the data. • Added to patient PIS: You will not be able to participate in this research if you do not consent to audio/video recordings of the interview/focus group. This is because these recordings are needed to help us understand your views on stopping unnecessary medicines.

11	The following changes/revisions should be made to the Participant Information Sheet (PIS): 11.1. Add clear information regarding how a participant could request to take part in a one-to-one interview rather than a focus group discussion (e.g. 'If it's not possible to gather other patients to the focus group together then a one-to-one online or telephone interview will be organised ...'). 11.2. If applicable, insert clearer information that participants would be required to have access to Microsoft Teams software on their device in order to take part in the focus group discussions. 11.3. Page 2 stated 'You may turn off your camera and just keep your microphone on if you wish to for one-to-one online interviews' and requested that clear information was inserted to clarify whether participants could turn off their camera during the focus group discussions.	• 11.1 – <u>added to patient & Professional PIS:</u> If you would prefer an one-to-one online interview or a telephone interview, then please contact Daniel Okeowo (details below) so that can be arranged. • 11.2 – not applicable as Microsoft Teams software is not needed. We will send participants a guide on how to join focus groups without the software. • 11.3 – <u>changed on the patient & Professional PIS</u>: It would help us if you kept your camera on during the focus group, but if you would prefer, you may turn off your camera and just keep your microphone on during interviews and focus groups • 11.4 – We agree it is a good idea to provide the ground rules in advance of the focus groups. However, we are also mindful of overburdening participants and extending the PIS further given it is already 4 pages long. We therefore propose to send the Focus group rules along with the MS Teams guide once consent is received so that, as suggested, participants receive them in written form. In addition these will displayed and verbally reiterated prior to the focus group commencing.

	11.4. It was noted that there were several rules included at the start of the focus group topic guide and requested that the first 5 rules were included in the PIS so that participants received them in writing as well as verbally	
	The following changes/revisions should be made to the adverts: 12.1. Review the sentence in the professional advert 'We would like to hear your views and opinions on how best to implement deprescribing in primary care', to make it clear what the study involved, as it could be perceived that the study involved patient deprescribing.	• <u>Added to professional recruitment poster</u>: This will involve focus groups/interviews around the topic of deprescribing in primary care.
13	The following changes/revisions should be made to the consent forms: 13.1. Insert clearer information as to what personal data in statement 5 would be used 'I agree for the named researcher to use my personal data in order to organise the study (for example, arrange focus groups) and to contact me	• <u>Added to 5. In patient & professional consent forms</u>: I agree for the named researcher to use my personal data (name, age, gender, ethnicity, job title, telephone number and email address) in order to organise the study (e.g. arrange focus groups), to contact me regarding the results of the study and to use them anonymously when reporting the results of the research.

	regarding the results of the study.	
14	**Recommendation (not required to achieve a Favourable Opinion)** The Committee suggested that participants could be provided with a pseudonym to use during the focus group/interviews rather than using their real name.	Thank you for this suggestion, we will explore how this could be practically implemented and discuss with our PPI representative.

Appendix J – Study 2 ethical approval document

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

Prof David Alldred
Professor of Medicines Use and Safety
University of Leeds
School of Healthcare
Baines Wing, Room 2.25a
University of Leeds
LS2 9JTN/A

Email: approvals@hra.nhs.uk
HCRW.approvals@wales.nhs.uk

29 March 2021

Dear Prof Alldred

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	**Deprescribing in Primary Care: identifying and developing deprescribing implementation resources**
IRAS project ID:	**288393**
REC reference:	**21/ES/0020**
Sponsor	**University of Leeds**

I am pleased to confirm that **HRA and Health and Care Research Wales (HCRW) Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report (including this letter) have been sent to the coordinating centre of each participating nation. The relevant national coordinating function/s will contact you as appropriate.

Appendix K – Patient recruitment poster

27/11/2020 Version 0.1 IRAS no: 288393

NIHR | Yorkshire and Humber Patient Safety Translational Research Centre

UNIVERSITY OF LEEDS

Safely Stopping Unnecessary Medicines: a research study

Are you aged 65 years or older and taking 5 or more different medicines?

We want to hear from you!

We would like to have a conversation with you on how unnecessary medicines can be safely stopped in a way that works for patients.

This will involve you sharing your views and opinions on stopping medicines safely with a group of other patients in a group interview, or if you'd prefer, individually in a one-to-one interview. Group interviews and interviews will take place online or using a telephone

To compensate you for your time, you will receive a £20 Amazon voucher.

If you are interested in taking part, or have any further questions, please contact before **30th June 2021**:

- Daniel Okeowo
- Umdao@leeds.ac.uk
- 07534425961

Appendix L – Patient information sheet

School of Healthcare/Faculty of Medicine and Health

01/03/2021 Version 0.2
IRAS no: 288393

UNIVERSITY OF LEEDS

Safely Stopping Unnecessary Medicines: a research study

Patient Information Sheet

You have been invited to take part in a research project, and it is important that you understand everything that is being asked of you. This document will provide you with the key details. If you have any further questions, please do not hesitate to contact the researcher (Daniel Okeowo).

What is the study's purpose?
Medicines are usually necessary and beneficial for patients. However, sometimes, medicines can become a problem. For example, they may cause side effects or they may no longer be needed because the patient has got better. We (the research team and its sponsor, University of Leeds) are interested in how we can make sure that patients are not taking medicines that they no longer need. We would like your views on how this can be done in a way that is safe and supportive. We will also be separately asking GPs and pharmacists how they think this should be done.

Who will be involved in this research?
This research will involve:

- Patients taking at least 5 different medicines and who are at least 65 years old

What would taking part involve?
We would like you to take part in an online interview with a group of other patients. This is called a 'focus group' and we aim to have 5 – 8 participants in each group. We would like you to share your views on ways healthcare professionals can help patients to stop taking medicines they do not need anymore. You would be expected to attend one online group interview which will last no longer than 90 minutes. The focus group will be video recorded. We will not be asking you about your own medicines and we will not be suggesting that you stop taking any of your medicines. Each focus group will consist of two interviewers who are researchers from University of Leeds or the NIHR Patient Safety Translational Research Centre. If it's not possible to gather other patients to the focus group together then a one-to-one online or telephone interview will be organised and recorded, lasting no longer than 60 minutes. If you would prefer a one-to-one online interview or a telephone interview, then please contact Daniel Okeowo (details below) so that can be arranged. It would help us if you kept your camera on during the focus group, but if you would prefer, you may turn off your camera and just keep your microphone on during interviews and focus groups.

What are the requirements?
You should be 65 years or older and taking five or more medicines that have been prescribed by your GP. You must have a good level of English speaking ability and be able to provide consent. To join an online focus group or interview, you will need a computer with access to the Internet, a working microphone and speaker, OR a mobile telephone/landline. You will only need a telephone to take part in a telephone interview.

UNIVERSITY OF LEEDS

Once you have provided consent to this study, we will let you know how to join the focus group and support you with this. If you need someone with you during the focus group or interview, for example, to provide computer support, then that is okay but they will need to agree not to share anything they hear.

What about my confidentiality?
To gain a better picture of the people taking part in the focus group and to help organise interviews, we will ask for your age, gender, ethnicity, number of medicines you take, telephone number and email address. All your personal information will be kept confidential. We will be publishing information about the people who took part e.g. age range, gender balance but this will be anonymous. It will not be possible to identify you from what you say, but we will say that the response was from a patient. Your contact details will be kept until the end of the study to let you know what we found out. Once the study has finished and we share the study findings, your contact details will be securely disposed of.

Confidentiality within the focus group is limited as there will be other patients and researchers present. Only you, the researchers, and the other people in the group will know what you say in this focus group. However, if you say anything that concerns the interviewer about you or someone else's safety, they might have to tell someone who could help. The interviewer will talk to you privately about this before they tell anyone else. There is a risk that sensitive information may be shared by other participants. You must not share what has been said in the focus group or interview with anyone outside of the focus group or interview.

The audio of the focus groups/interviews will be securely sent to a university approved company to be written up, using their secure file upload system. No other personal identifiable data or contact details will be shared with the transcription company. The transcription company will only have access to the recordings for the time needed to write down what was said and no longer, and they will also sign a data processing agreement to confirm this. We will ensure transcripts are anonymised.

What will you do with my responses?
Your responses will be important in understanding how we can help make sure that patients are not taking unnecessary medicines. This will be used to design tools to help healthcare staff in stopping medicines that are not needed. Anonymous quotes from what you say may be published in journals and used with other responses to teach others, for example, they may be used as part of a presentation.

How will we use information about you?
We will need to use information from you for this research project. This information will include your name, age, gender, ethnicity, number of medicines taken, telephone number and email address. We will keep all information about you safe and secure. Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study. Once the audio recording of your focus group/interview has been transcribed, the original recording will be

kept and stored for 1 year on a password-protected drive on the University of Leeds server. After this, the recording will be destroyed and irretrievable.

Your anonymous quotes may be shared with other researchers or be used in future research for learning. To accommodate this, these anonymous quotes may be stored in the Research Data Leeds Repository. This is a research data repository for the University of Leeds that aims to enable data discovery and data sharing. Only anonymous quotes and the data from this will be stored in the repository, no personal or identifiable information will be stored here. This will allow for your anonymous quotes on safely stopping unnecessary medicines to be shared and used by future researchers.

What to expect during the consent process
A consent form will be emailed to you. This form must be signed and returned before you can take part in the study. This can be electronically signed or hand-written and returned via email. You may also take and send a picture of the signed consent form (e.g. using a mobile phone) providing all four corners of the document can be seen and the text can be read from the photo. If you are unable to email this back or there is no time to before the study starts, we will ask for your verbal consent and record this over the phone or on the online call. You will not be able to participate in this research if you do not consent to audio/video recordings of the interview/focus group. This is because these recordings are needed to help us understand your views on stopping unnecessary medicines.

What if I no longer want to be part of the study?
You may withdraw from the study at any point up until the focus group has been completed. After this time, we will not be able to separate your responses from the other patients in the group. You may withdraw from one-to-one interviews at any point and may withdraw your data from these interviews up until it has been analysed.

What are your choices about how your information is used?
You can stop being part of the study at any time as mentioned above, without giving a reason, but we will keep information about you that we already have. We need to manage your records in specific ways for the research to be reliable. This means that we won't be able to let you see or change the data we hold about you.

Are there any risks involved?
We don't think there are any risks in taking part. It is possible that some people may get upset when talking about their medicines and health. If this happens, then we can take a break and offer you support.

Who is funding this research?
This study is funded by The National Institute for Health Research (NIHR) and situated within the NIHR Yorkshire and Humber Patient Safety Translational Centre. This study is sponsored by University of Leeds.

Will I be reimbursed for my time?
Yes, you will receive a £20 Amazon voucher for your time.

Where can you find out more about how your information is used?
The link to the University privacy statement for research participants is: https://dataprotection.leeds.ac.uk/wp-content/uploads/sites/48/2019/02/Research-Privacy-Notice.pdf.

You can find out more about how we use your information

- at www.hra.nhs.uk/information-about-patients/
- our leaflet available from https://dataprotection.leeds.ac.uk/wp-content/uploads/sites/48/2020/08/My_data_and_research.pdf
- by asking one of the research team or
- by sending an email to the University Data Protection Officer dpo@leeds.ac.uk

What if I have further questions?
Please do not hesitate to contact the research team:

Daniel Okeowo

Email: umdao@leeds.ac.uk
Telephone: 07534425861

Prof David Alldred (supervisor)

Email: d.p.alldred@leeds.ac.uk
Telephone: (0113) 343 1805

Appendix M – Patient recruitment infographic

Appendix N – Consent form

School of Healthcare/ Faculty of Medicine and Health
01/03/2021 Version 0.2
IRAS ID: 288393

CONSENT FORM

UNIVERSITY OF LEEDS

Title of Project: Safely Stopping Unnecessary Medicines: a research study

Name of Researcher: Daniel Okeowo

Please initial box

1. I confirm that I have read the information sheet dated 01/03/2021 (version 0.2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered. ☐
2. I understand that taking part is voluntary and that I am free to withdraw, until I have participated in the allocated focus group or my interview data has been analysed, without giving any reason, without my medical care or legal rights being affected. ☐
3. I agree for my focus group/interview to be audio or video recorded, for the audio to be transcribed by a transcription service company and for my anonymised quotes to be used in future publications, research and shared with other researchers. ☐
4. I agree for my anonymised quotes to be stored in the University of Leeds Research Data Leeds Repository. ☐
5. I agree for the named researcher to use my personal data (name, age, gender, ethnicity, number of medicines currently taking, telephone number and email address) in order to organise the study (for example, arrange focus groups), to contact me regarding the results of the study and to use them anonymously when reporting the results of the research. ☐
6. I agree not to disclose information discussed during the focus group/interview to anyone outside of the focus group/interview. ☐
7. I agree to take part in the above study. ☐

Name of Participant	Date	Signature
Name of Person taking consent	Date	Signature

Appendix O – Interview topic guides

Interview topic guides – Patients

Welcome and introductions –
Hello, my name is Daniel and I would like to welcome you to this interview. Thank you very much for providing your consent to be interviewed. . This is an opportunity for you to have a say on how we make sure that medicines that are no longer needed can be safely stopped. This can only work if you share your opinions and ideas so please do not feel like you can't. If you find yourself repeating a point you've already said before, please don't worry about this as it will still be valuable to us and can give us more information. As it mentions in the information we gave you, we will not be making any recommendations about your medicines today and if you have any concerns about your medicines, you should contact your GP.

Deprescribing – overview

- **So to start off with, how do you feel about taking medicines in general?**
- **Have you ever had a regular medicine stopped?**
  - If so, how was this like for you?
    - How was the idea of stopping a medicine introduced to you
    - Did you have any concerns or questions?
    - What could have been done to improve you experience?
  - If not, have you ever had a conversation with your GP/Pharmacist about stopping a regular medicine?
    - Did you attempt stopping the medicine with your doctor?
    - Was there any reason why the medicine could not be stopped?

A scenario will then be introduced and explained for discussion

Scenario: "Let's say your doctor recently reviewed your medicines and believes you might benefit from stopping one of you regular medicines…"

Patient education
First of all, I would like to know what sort of information you would want from your doctor about the plan to stop the medicine

- **How would you want the idea of stopping a medicine introduced to you?**
- **What would be important for you to know about stopping a medicine?**
  - Why would this information be important to you?
  - How would you like to receive this information?
    - In what forms?
  - Is there any information that you would want to take home?
    - How would you like to take this information home?
- **Would it be important for you to know the risks and benefits of stopping a medicine?**
  - How would you like for someone to explain the risks and benefits of you stopping a medicine?
  - Who would you like to explain the risks and benefits to you? e.g. your GP, a pharmacist at your local chemist or nurse?

        - If not, why not ?
- **Would there be anything you would want someone to speak to your family, or perhaps anyone else who helps you with your medicines, about stopping a medicine?**
    - Why would this information be important for them to know?
- NPT – Cognitive participation (Legitimation) **– Do you think you should be involved in decisions about stopping a medicine, and how to go about it?**
    - Do you think you could be involved in the decision to stop a medicine?
        - If not, why not?
    - Is there any reason why you don't think you should or could be involved in stopping a medicine.
- **Taking the scenario into account, are there any other questions you would want to ask?**
    - If so, what are they?

<u>Reintroduce scenario:</u>
"You and your doctor have agreed for you to stop taking the medicine and you have agreed to a plan to slowly reduce your doses until it's safe to take you off the medicine completely..."

<u>Patient support</u>
Now I want to discuss the type of support you may want or need from your doctor, nurse or pharmacist while you are stopping a medicine. By support, I mean anything a healthcare professional may say or do, after the initial agreement to stop a medicine, that helps you to feel comfortable whilst stopping a medicine.

- **Taking this into account, is there anything additional you would want your doctor to do or provide to help you with stopping a medicine? E.g. written information about what to look out for**
    - Why do you think this is needed?
    - How would you want this support provided?
    - How often would you want someone to check up on you whilst you are stopping a medicine?
        - Which healthcare professionals would you be happy with to do this? e.g. your GP, a pharmacist at your local chemist or nurse?
    - How often would you want someone to check up on you after stopping the medicine?
        - Which healthcare professionals would you be happy with to do this? e.g. your GP, a pharmacist at your local chemist or nurse?
- **What could other healthcare professionals do to help you with stopping a medicine?**
    - Why would this be important to you?
- NPT – Collective action (relational Integration) – **What would make you feel confident about stopping a medicine? If anything?**
    - Why is this the case?
    - If nothing, why do you feel you can't be confident about stopping a medicine?

The role of pharmacists (leave remaining 15 - 20 mins for this)

I'd like to move on to talking about the role of pharmacists in helping you stop unnecessary medicines. The type of pharmacists we will be talking about are community pharmacists (the pharmacist at your local chemist) and GP pharmacists (pharmacists that work closely with your GP and are part of the GP practice, but not in a chemist within a GP)

- **With this scenario, we imagined your doctor being the one to start and oversee you stopping a medicine, how would you feel if it was a GP pharmacist that stopped a medicine with you, whilst your GP oversees this?**
  - How about if they have the qualification to prescribe or not?
- **How do you think your local pharmacy (i.e. at the chemist) could help with stopping a medicine?**
  - Why would your local chemist be best suited for this role?
  - If nothing, why don't you think your local chemist could help?
  - What's your experience of talking to your community pharmacist about your medicines?

I have pulled out some tasks pharmacists could do to help you stop a medicine, based on what we have found out so far.

How would you feel if a GP pharmacist was to:

- Look at your medicines to highlight suitable medicines to stop?
- Provide recommendations of suitable medicines to stop to your GP?
- Stop a medicine themselves in agreement with you, on behalf of and supported by your GP?
- Provide information on the risks and benefits of your medicine and of stopping that medicine?

How would you feel if a community pharmacist was to:

- Provide recommendations of suitable medicines to stop to your GP?
- Provide information on the risks and benefits of your medicine and of stopping that medicine?
- Be a point of contact for if you have any issues or questions about stopping a medicine?
- Help to check up on you to make sure everything is okay?

Closing the session

Thank you for your time and giving your opinions here today. It has been really insightful and valuable. We will contact you soon regarding your £20 Amazon voucher as compensation for you time. We will also contact you about the study findings once we have completed all the focus groups and interview.

Appendix P – Example Study 2 patient analytical framework

Name and codes	Description
Nature of patient support	Patient describes patient support they want/expect
Ability to contact a HCP	
Patient wants to be able to receive advice during deprescribing	Patient wants to be able to receive advice from any relevant healthcare professional during the deprescribing process
Patient wants to contact their Dr specifically if symptoms occur	Patient specifically wants access to their own doctor if symptoms occur
Ability to restart medicine	Patient places emphasis on the ability to restart a medicine during deprescribing
Clinical monitoring during deprescribing	
Clinical monitoring after deprescribing	Patient discusses any monitoring they deem necessary after deprescribing
Patient self-monitoring	Patient placed emphasis on self-monitoring themselves where possible
Frequency of Support	
No need for frequent support unless indicated	
Patient preference on HCP	
No preference	Patient had no specific preference for who provided support, as long as they were best equipped to do so
Pharmacist support	Patient would prefer pharmacist to provide support
GP support	Patient would prefer GP consultations for education or support
Patient would leave nature of support to Dr	Patient would leave the support needed for the Dr to decide

Appendix Q – COREQ for Chapter 5 and Chapter 6

Chapter 5

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	117
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	N/A
Occupation	3	What was their occupation at the time of the study?	257
Gender	4	Was the researcher male or female?	N/A
Experience and training	5	What experience or training did the researcher have?	257
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	116
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	399 - 402
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	257, 399 - 402
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	118
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	115 - 116
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	115 - 116
Sample size	12	How many participants were in the study?	121
Non-participation	13	How many people refused to participate or dropped out? Reasons?	NA
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	117
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	121
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	121 - 122
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	116 - 117
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	121
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	117
Field notes	20	Were field notes made during and/or after the inter view or focus group?	118
Duration	21	What was the duration of the inter views or focus group?	121
Data saturation	22	Was data saturation discussed?	116
Transcripts returned	23	Were transcripts returned to participants for comment and/or	121

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	118
Description of the coding tree	25	Did authors provide a description of the coding tree?	122
Derivation of themes	26	Were themes identified in advance or derived from the data?	122
Software	27	What software, if applicable, was used to manage the data?	118
Participant checking	28	Did participants provide feedback on the findings?	121
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	122 - 139
Data and findings consistent	30	Was there consistency between the data presented and the findings?	123 - 139
Clarity of major themes	31	Were major themes clearly presented in the findings?	122 - 139
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	122 -139

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	153
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	N/A
Occupation	3	What was their occupation at the time of the study?	257
Gender	4	Was the researcher male or female?	N/A
Experience and training	5	What experience or training did the researcher have?	257
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	151
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	414 - 417
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	257, 414 - 417
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	153
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	151 - 152
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	151 - 152
Sample size	12	How many participants were in the study?	154
Non-participation	13	How many people refused to participate or dropped out? Reasons?	NA
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	153
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	154
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	154 - 155
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	152 - 153
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	154
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	153
Field notes	20	Were field notes made during and/or after the inter view or focus group?	153
Duration	21	What was the duration of the inter views or focus group?	154
Data saturation	22	Was data saturation discussed?	152
Transcripts returned	23	Were transcripts returned to participants for comment and/or	154

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	118
Description of the coding tree	25	Did authors provide a description of the coding tree?	156
Derivation of themes	26	Were themes identified in advance or derived from the data?	155
Software	27	What software, if applicable, was used to manage the data?	153
Participant checking	28	Did participants provide feedback on the findings?	154
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	155 - 176
Data and findings consistent	30	Was there consistency between the data presented and the findings?	155 - 176
Clarity of major themes	31	Were major themes clearly presented in the findings?	155 - 176
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	155 - 176

Appendix R – Recruitment Poster

01/03/2021 Version 0.2 IRAS no: 288393

NIHR | Yorkshire and Humber Patient Safety Translational Research Centre

UNIVERSITY OF LEEDS

Deprescribing in Primary Care: Identifying and Developing Deprescribing Implementation Resources

Are you are a:

- GP
- PCN/Practice Pharmacist with a patient-facing role
- Community Pharmacist
- CCG staff involved in medicines management

We want to hear from you!

We would like to hear your views and opinions on how best to implement deprescribing in primary care. This will involve focus groups/interviews around the topic of deprescribing in primary care.

We will be holding online focus groups (or one-to-one interviews if preferred) at a time convenient for you.

This is a great opportunity for you to have a say on how deprescribing is implemented within primary care!

If you are interested in participating, or have any further questions, please contact :

- Daniel Okeowo
- Umdao@leeds.ac.uk
- 07534425961

Appendix S – Information Sheet

School of Healthcare/Faculty of Medicine and Health

01/03/2021 Version 0.2
IRAS no: 288393

UNIVERSITY OF LEEDS

Deprescribing in Primary Care: Identifying and Developing Deprescribing Implementation Resources

Professional Information Sheet

You have been invited to participate in a research project about implementing deprescribing for problematic polypharmacy in primary care. This information sheet provides information about the study including what would be expected from you if you agree to take part. If you have any questions after reading this, please do not hesitate to contact the primary researcher, Daniel Okeowo.

Purpose of the study
Polypharmacy, the concurrent use of 5 or more medicines, may become problematic when multiple medicines are prescribed inappropriately or the intended benefit of the medicine is not realised. Problematic polypharmacy is increasing in older people and deprescribing is one potential solution. However, there is little evidence on how deprescribing should be safely implemented within primary care, and what the optimal role of GPs and pharmacists should be. This study will investigate how deprescribing can be safely implemented through the views of relevant stakeholders. We (the research team and its sponsor, University of Leeds) then intend to develop resources to support deprescribing implementation in primary care.

Who is conducting and funding the study
This study will be conducted by Daniel Okeowo as part of his doctoral studies at the University of Leeds. This study is sponsored by University of Leeds and will be supervised by Prof David Alldred (School of Healthcare), Dr Syed Tabish Zaidi (School of Healthcare), Dr Beth Fylan (School of Psychology). The study funder is The National Institute for Health Research (NIHR).

Why have I been chosen?
You have been chosen because you are a member of one of the below professional groups and involved in deprescribing/medicine management. This research will involve:

- GPs
- PCN/Practice Pharmacists who have patient-facing roles
- Community Pharmacists
- Clinical Commissioning Groups (CCGs) staff who have roles in prescribing/the use of medicines

The views of patients will also be explored separately.

What is expected from me?
We would like you to participate in an online focus group to explore and discuss your views on how best to implement deprescribing within primary care, and the role of GPs and pharmacists in doing so. There will be one online focus groups consisting of 4 – 6 healthcare professionals lasting up to 90 minutes. This will be video recorded and transcribed. Each focus group will consist of two facilitators who are researchers from University of Leeds or the NIHR Patient Safety Translational Research Centre. If focus groups cannot be organised due to availability constraints, individual online or telephone interviews will be undertaken lasting no longer than 60 minutes. Individual online interviews will be video recorded and transcribed and as an alternative, telephone interviews will be audio recorded and transcribed. If you would prefer a one-to-one online interview or a telephone interview, then please contact Daniel Okeowo (details below) so that can be arranged. It would help us if you kept your camera on during the

focus group, but if you would prefer, you may turn off your camera and just keep your microphone on during interviews and focus groups.

What are the requirements?
You must meet the inclusion criteria above. To join an online focus group or interview, you will need a computer with access to the Internet, a working microphone and speaker, OR a mobile telephone/landline. You will only need a telephone to take part in a telephone interview.

Once you have provided consent to this study, we will let you know how to join the focus group and support you with this.

How will my information be kept confidential?
To gain a better understanding of the participants recruited and to help organise interviews, we will ask for your age, gender, job title, telephone number and email address. All information gathered about you during this study will be kept confidential and will be stored in the University of Leeds password-protected servers or locked within the University premises. This will be in accordance with the University of Leeds data management code of practice (https://dataprotection.leeds.ac.uk/data-protection-code-of-practice/), the Data Protection Act 2018 and the General Data Protection Regulation. We will be publishing information about the people who took part in this study e.g. age range but this will be anonymous. It will not be possible to identify you from your responses, however we will state that the response was from a participant with your job role (e.g. GP, pharmacist, CCG staff etc). Contact details will be kept until the end of the study and data analysis in order to notify you of the results. Once the study has concluded and the findings have been shared, your contact details will be securely disposed of.

Confidentiality within the focus group is limited as there will be other healthcare professionals and researchers present. What is said within the focus group / interview will be treated as confidential and the data will be anonymised, however if you reveal anything which raises safeguarding or similar concerns, this may have to be discussed with the appropriate people. However, this will be discussed with you privately before anyone else is involved. There is a risk that sensitive information may be shared by other participants. You must not share what has been said in the focus group or interview with anyone outside of the focus group or interview.

A transcription service will be used to produce transcripts of the focus group or interview. The audio of the focus groups/interviews will be securely sent to a university approved company to be written up, using their secure file upload system. No other personal identifiable data or contact details will be shared with the transcription company. The transcription company will only have access to the recordings for the time needed to write down what was said and no longer, and they will also sign a data processing agreement to confirm this. We will ensure transcripts are anonymised.

How will the research data be used?
Your focus group / interview responses will be the primary research data used within this study. Your responses will be used to help identify strategies and resources that aid the implementation of deprescribing in primary care to be further developed in the future. In addition, your responses will provide valuable insight on how to optimise deprescribing as a key stakeholder. Your anonymised responses may be published in journals and used in presenting information e.g. conference posters and presentations.

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How will we use information about you?
We will need to use information from you for this research project. This information will include your name, age, gender, job title, telephone number and email address. We will keep all information about you safe and secure. Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

Once the audio recording of your focus group/interview has been transcribed, the original recording will be kept and stored for 1 year on a password-protected drive on the University of Leeds server. After this, the recording will be destroyed and irretrievable.

Your anonymous quotes may be shared with other researchers or be used in future research for learning. To accommodate this, these anonymous quotes may be stored in the Research Data Leeds Repository. This is a research data repository for the University of Leeds that aims to facilitate data discovery and data sharing. Only anonymous quotes and the data from this will be stored in the repository, no personal or identifiable information will be stored here. This will allow for your anonymous quotes on deprescribing in primary care to be shared and used by future researchers.

What to expect during the consent process?
A consent form, detailing your agreement to the study, will be emailed to you. This form must be signed and returned before you can participate in the study. This can be electronically signed or hand-written and returned via email. You may also take and send a picture of the signed consent form (e.g. using a mobile phone) providing all four corners of the document can be seen and the text can be read from the photo. If email contact is unavailable or time constraints make this impractical, your verbal consent will be requested and recorded. You will not be able to participate in this research if you do not consent to audio/video recordings of the interview/focus group. This is because these recordings are needed to analyse the data.

What if I no longer want to be part of the study?
You may withdraw from the study at any point until focus group completion. This is because, as your response will be anonymous, it will not be possible to withdraw it from other responses. You may withdraw from one-to-one interviews at any point and may withdraw your data from these interviews up until it has been analysed.

What are your choices about how your information is used?
You can stop being part of the study at any time as described above, without giving a reason, but we will keep information about you that we already have. We need to manage your records in specific ways for the research to be reliable. This means that we won't be able to let you see or change the data we hold about you.

Where can you find out more about how your information is used?
The link to the University privacy statement for research participants is: https://dataprotection.leeds.ac.uk/wp-content/uploads/sites/48/2019/02/Research-Privacy-Notice.pdf.
You can find out more about how we use your information

- by asking one of the research team or
- by sending an email to the University Data Protection Officer dpo@leeds.ac.uk

What if I have further questions?
Please do not hesitate to contact the primary investigator:

01/03/2021 Version 0.2
IRAS no: 288393

Daniel Okeowo
Email: umdao@leeds.ac.uk
Telephone: 07534425861

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Prof David Alldred (supervisor)
Email: d.p.alldred@leeds.ac.uk
Telephone: (0113) 343 1805

Appendix T – Consent form

School of Healthcare/Faculty of Medicine and Health
01/03/2021 Version 0.2
IRAS ID: 288393

CONSENT FORM

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Title of Project: Deprescribing in Primary Care: Identifying and Developing Deprescribing Implementation Resources

Name of Researcher: Daniel Okeowo

Please initial box

1. I confirm that I have read the information sheet dated 01/03/2021 (version 0.2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered. ☐
2. I understand that taking part is voluntary and that I am free to withdraw, until I have participated in the focus group or my interview data has been analysed, without giving any reason. ☐
3. I agree for my focus group/interview to be audio or video recorded, for the audio to be transcribed by a transcription service company and for my anonymised quotes to be used in future publications, research and shared with other researchers. ☐
4. I agree for my anonymised quotes to be stored in the University of Leeds Research Data Leeds Repository. ☐
5. I agree for the named researcher to use my personal data (name, age, gender, ethnicity, job title, telephone number and email address) in order to organise the study (e.g. arrange focus groups), to contact me regarding the results of the study and to use them anonymously when reporting the results of the research. ☐
6. I agree not to disclose information discussed during the focus group/interview to anyone outside of the focus group/interview. ☐
7. I agree to take part in the above study. ☐

Name of Participant	Date	Signature
Name of Person taking consent	Date	Signature

Appendix U – HCP Interview topic guide

10/05/2021 Version 2.0
IRAS no: 288393

Focus group topic guides – Practice Pharmacist

Facilitator (Daniel Okeowo): My name is Daniel and I would like to welcome you to this interview and thank you for providing consent. This is an opportunity for you to have a say on how medicines can be safely stopped (i.e. deprescribing) in your patients, but can only work if you share your opinions and ideas so please do not feel like you can't. In addition, you may find yourself repeating a point you've already said before, please don't worry about this as this is still valuable to us and can give us more clarification.

Initial warm-up conversations

So before we start, I wanted to take a moment to clarify what type of deprescribing we want to discuss. Deprescribing can be either "reactive" or "proactive". Reactive deprescribing is the discontinuing of a medicine in response to an adverse clinical trigger, such as a side effect, for example, somebody having a ulcer with an NSAID. Proactive deprescribing is stopping a medicine if future gains are unlikely to outweigh future harms. An example of proactive deprescribing might be stopping a statin for primary prevention of cardiovascular disease in a frail, older patient.

Further discussion this afternoon, we would like to focus on proactive deprescribing.

- To start off, When you think about your deprescribing experiences what's the first thing that comes to mind?

Deprescribing – barriers and facilitators to implementation

So, thinking about implementing deprescribing in primary care,

- **Is there anything that stops you from routinely deprescribing?**
  - Why do you think this is the case?
  - Can you give examples of this in your practice?
  - How could these barriers be overcome?
- **So, on the other side of the coin, Is there anything that helps you to routinely deprescribe?**
  - Why is this the case?
  - Can you recall examples from your own experience?
  - Which medicines would you say are important to deprescribe?
    - Which medicines do you regularly deprescribe? Why?
    - Which medicines do you rarely deprescribe? Why?
- NPT – Coherence (Internalisation) – **Do you think there is a consensus in your profession on the value and importance of deprescribing in primary care?**
  - Why do you think this consensus has formed?
  - If not, why do you think there isn't a consensus
  - **Do you think there is a consensus in other professions on the value and importance of deprescribing in primary care?**
    - How do these opinions differ from your own profession?
    - Why do these opinions differ?
  - If there is no consensus within other professions, why do you think this the case?

- **How do your patients respond to deprescribing conversations or the idea of stopping a medicine?**
  - What reactions have you had?
  - What do you think has contributed to this reaction?
  - Would this perception affect how you introduce deprescribing to patients?
- NPT – Coherence (Internalisation) – **Do you think your patients see deprescribing as something important or beneficial to themselves?**
  - If not, why not?
  - Do you have any suggestions on how to improve patients' understanding on the value and importance of deprescribing?
- NPT – Cognitive Participation (legitimation) – **Do you think patients believe it is right for them to be involved in decisions about the deprescription of their medicines?**
  - Is this belief important?
  - How could we engage patients to feel it is right for them to be involved?
- NPT – Cognitive Participation (legitimation) – **Do you think clinicians within your practice/pharmacy (or other pharmacies)/organisation believe it is right for them to be involved in deprescribing in primary care**?
  - What would engage others in your practice/pharmacy/organisation to believe they should be involved?
  - Do you think any other primary care clinicians should believe it's right for them to be involved in deprescribing?
    - If so, how could deprescribing involvement be promoted in this profession?
- NPT – Cognitive participation (enrolment) – **What needs to be done to improve the overall engagement of patients, clinicians, and policy makers to deprescribing in primary care?**

<u>Role of the pharmacist</u>

Now, I want to take some time to discuss the role of pharmacists in deprescribing in primary care.

- **What roles do practice pharmacists have in deprescribing?**
  - What benefits would this (or has this) role provide(ed) to your own practice?
    - deprescribing in general?
  - What are the possible drawbacks?
  - If there are no roles for primary care pharmacists, why is this the case?
- **What roles do you see for community pharmacists to have in deprescribing?**
  - What benefits would this (or has this) role provide(ed) to your own practice?
    - deprescribing in general?
  - What are the possible drawbacks?
  - If there are no roles for community pharmacists, why is this the case
  - **What knowledge, skills or abilities can pharmacists (community or primary care) offer to aid the implementation of safe and routine deprescribing in primary care?**

Patient Safety

Now I would like to discuss patient safety in relation to proactive deprescribing in primary care

- **Are there any risks associated with deprescribing in primary care?**
  - Have you had any experiences of safety concerns during deprescribing?
  - How do you anticipate what the risks are for each individual patient?
  - How do you mitigate such risks?
- **Reflecting on your own practice, What do you do to make sure deprescribing is done safely?**
  - How did this practice start?
    - What influenced this safety practice
  - Do you have any specific patient examples?
- **Do you do anything to monitor and follow up with patients after deprescribing?**
  - Does anything stop you from be able to monitor and follow up with a patient?
- **What could be done to make it safer?**
  - How could we make it routinely safer?
  - Could we implement these safety measure into primary care right now?
    - How could we overcome such barriers if any?

Organisational support

Next I would like to discuss the type of support patients and clinicians might need during and after the deprescribing process

- NPT – Collective action (Contextual integration) – **What organisational support (from your own practice/pharmacy, CCG or the NHS) is currently available to implement and sustain deprescribing in primary care? (e.g. resources, guides or incentives?)**
  - Is there anything further you feel you need?
- **What support, if any, do you think is necessary for the patient during and after the deprescribing process and why?**
  - How feasible is it to provide this kind of support in current primary care?
  - How would you implement this support in your own practice?
- **Can you provide examples of support that you might have given to patients when you have been deprescribing?**
  - How beneficial do you believe this support was?
  - How would you change this support, if possible, to better patient safety and experience?
- **Does the availability of patient support that you can offer to patients affect the likelihood of deprescribing occurring?**

Education & Training

Now, I would like to discuss patient education and clinician training.

- **What information do you think patients need to be able to safely stop a medicine?**
  - How would you convey this information to patients (what type of format)?
  - Can you recall experiences of this?

        - If so, how would you make this experience better for the patient?
- **Can other professions help in conveying this information to patients?**
    - If so, what would be their roles?
        - Why do you believe they are suited for this?
- Following back to the first question in this section, **what information is currently feasible to provide to patients to help them safely stop a medicine?**
    - Is there any information that you feel patients need to safely stop a medicine, but cannot currently provide for any particular reason?
- NPT – Collective action (skill set workability) – **What type of education or training, if any, would your role require for routine and safe proactive deprescribing?**
    - Why would is this education or training be needed?
    - What about other staff that you work with?
        - Again, why would this education or training be needed?

Closing the session

Thank you all for you time and giving your opinions here today. It has been really insightful and valuable. We will contact you about the study findings once we have completed all the focus groups and interview. There may also be a few who haven't sent back their demographics information, could you please get this back to me as soon as possible.

Appendix V – Example Study 2 Healthcare professional analytical framework

Name and codes	Description
Common deprescribing scenarios	HCPs describe current common scenarios where deprescribing occurs
Consensus on deprescribing	Various factors influencing the consensus of HCPs on deprescribing
Clinical inertia affecting consensus of deprescribing	
Deprescribing importance yet to reach all HCPs	
Deprescribing not seen as a prescribing decision	
Deprescribing viewed more as an area of practice	
Expanding role of practice pharmacists conducting deprescribing	Involvement of practice pharmacists conducting SMRs and subsequent deprescribing
Lack of consensus on deprescribing implementation	A lack of agreement on the specific implementation of deprescribing
Lack of prescribing duties a barrier to deprescribing consensus	HCPs not involved in prescribing so do not have a view on deprescribing
More focus on acute problems rather than long-term goals	
National focus on polypharmacy forming consensus on benefits	Increased national focus on risks of problematic polypharmacy

Appendix W – Co-design patient recruitment poster and research summary

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Calling people 65 years or older taking 5 or more different medicines for online workshops

Sometimes patients may stay on medicines longer than needed. We are hosting two workshops with patients, GPs and pharmacists to create ideas that make it easier and safer to stop unnecessary medicines.

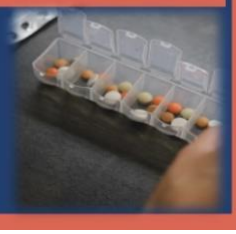
Where: Online using Zoom
(assistance with attending is available).

When:
Workshop 1: Thursday 7th July 2022 13:00 – 14:30 (90 minutes).
Workshop 2: Thursday 28th July 2022 13:00 – 14:30 (90 minutes).

We ask that you can commit to both workshops.

You will receive an £80 voucher per workshop attended as a token of appreciation after the 2nd Workshop.

To express interest please contact Daniel Okeowo (PhD student) umdao@leeds.ac.uk by 15th June.



Medicines are prescribed to benefit patients by treating their illnesses. However, sometimes, medicines can become a problem. For example, they may cause side effects, or they may no longer be needed because the patient has got better. We are interested in how we can make sure that patients are not taking medicines that they no longer need.

Our research, so far, has shown how important it is that healthcare professionals explain why they might recommend stopping a medicine. It has also shown the importance of patients being supported when stopping a medicine, and the potential role of pharmacists (especially local pharmacies) in doing this. We now want to bring all these ideas together.

We want to create ideas on how we can make stopping unnecessary medicines happen easier and safer. We also want to make sure that this works for patients and healthcare professionals. We will be hosting online workshops where we bring together patients, GPs, and pharmacists (also known as co-design workshops) to discuss and produce ideas that make it safe and easy to stop unnecessary medicines.

Appendix X – Co-design HCP recruitment poster and research summary

FUNDED BY

NIHR | National Institute for Health Research

UNIVERSITY OF LEEDS

Calling GPs, primary care pharmacists, and community pharmacists for deprescribing co-design workshops

Routine and safe deprescribing is one potential solution to address overprescribing and problematic polypharmacy.

We are hosting two workshops with healthcare professionals and patients to design resources or interventions that will aid the implementation of safe and routine deprescribing in primary care.

Where: Online using Zoom.

When:
Workshop 1: Thursday 7th July 2022 13:00 – 14:30 (90 minutes).
Workshop 2: Thursday 28th July 2022 13:00 – 14:30 (90 minutes).

We ask that you can commit to both workshops.

You will receive an £80 voucher per workshop attended as a token of appreciation after the 2nd Workshop.

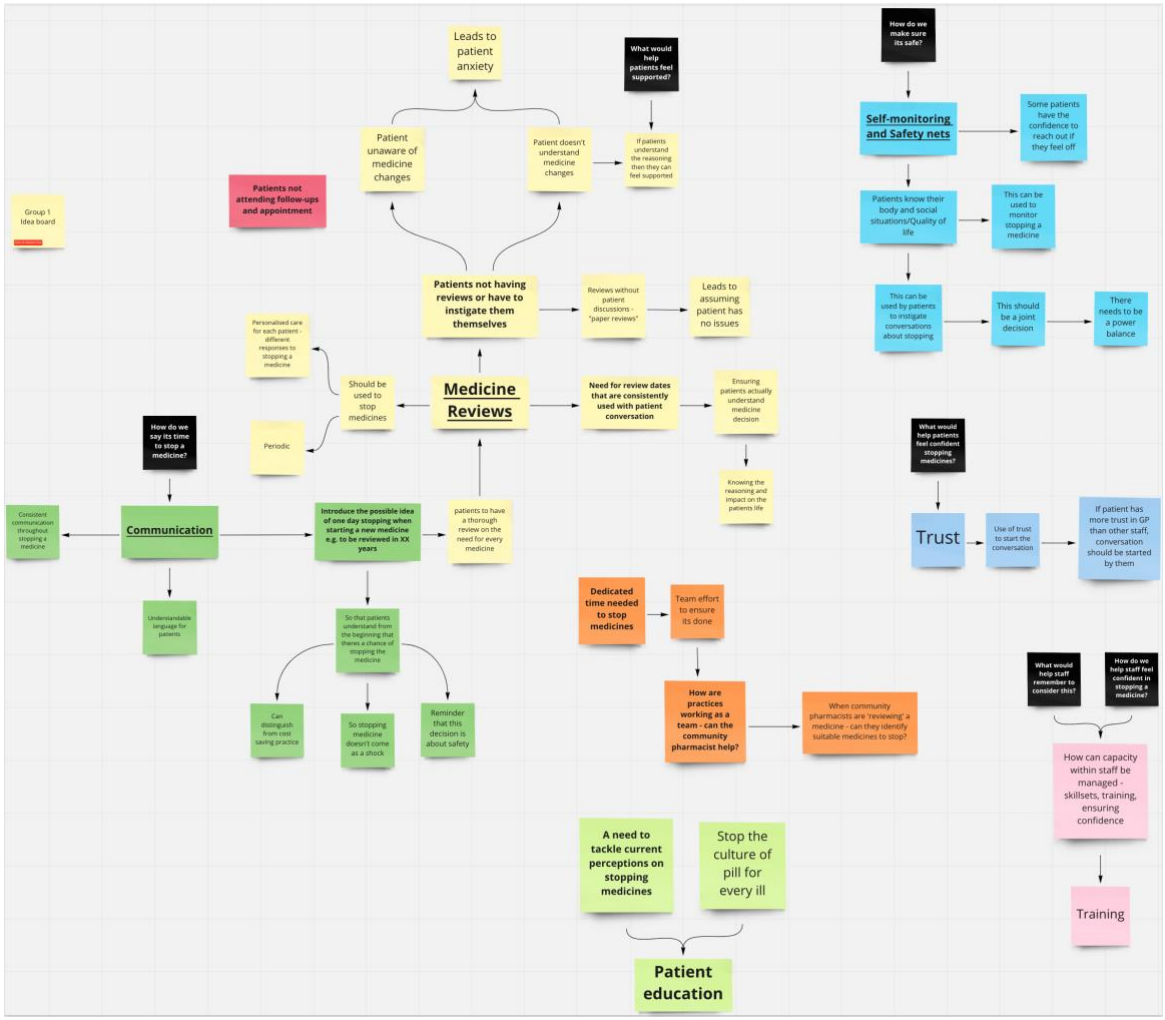
To express interest please contact Daniel Okeowo (PhD student) umdao@leeds.ac.uk by 15th June.

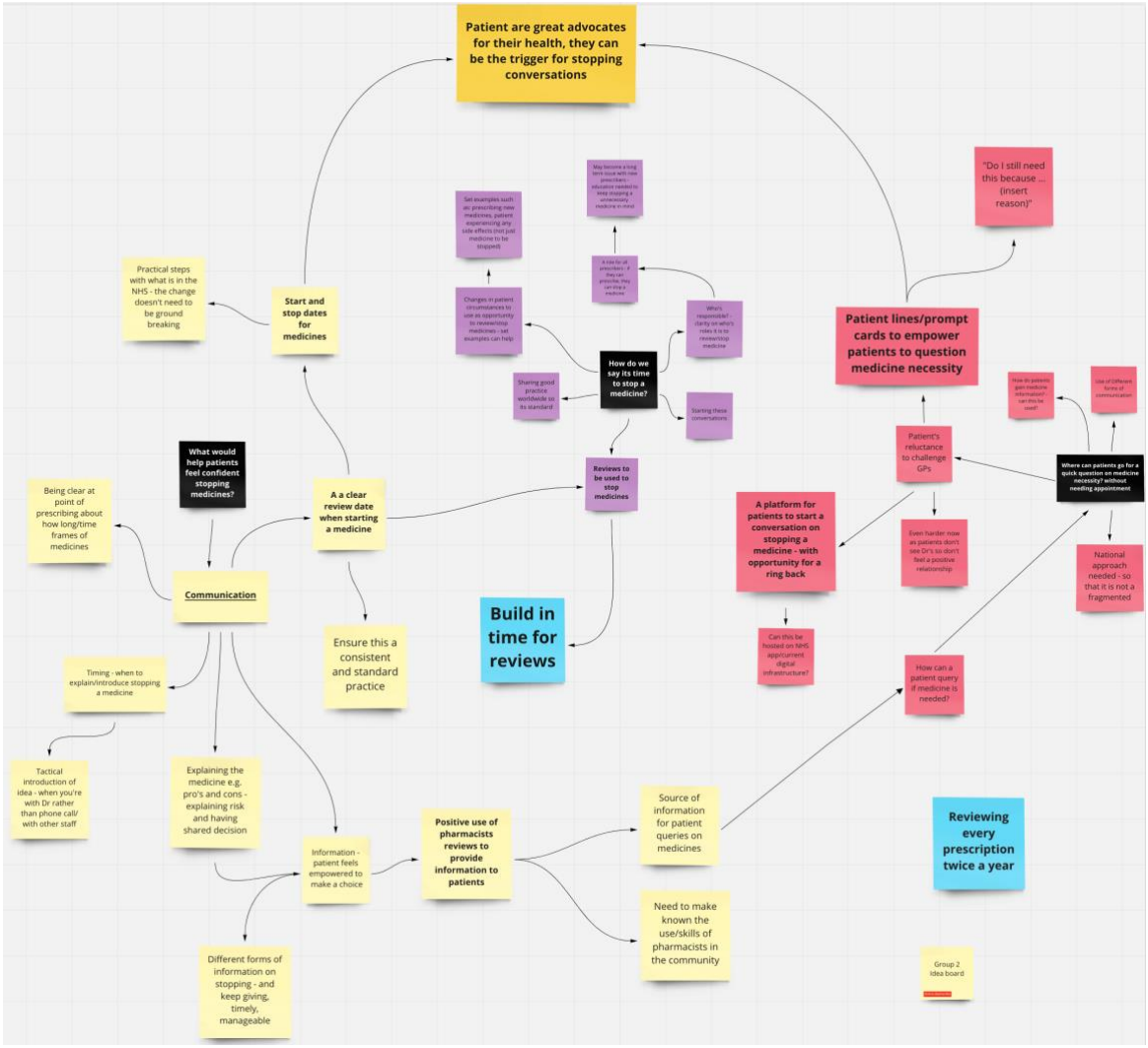
Medicines are prescribed to benefit patients, however, can become problematic. For example, they may cause adverse drug reactions or be no longer indicated. We are interested in how we can make sure that patients are not taking unnecessary medicines through the use of deprescribing.

Our research, so far, has shown the importance of establishing the rationale when proposing deprescribing to patients. It has also shown the importance of patients being supported during deprescribing, and the potential role of pharmacists (especially community pharmacists) in doing this. We now want to bring all these ideas together.

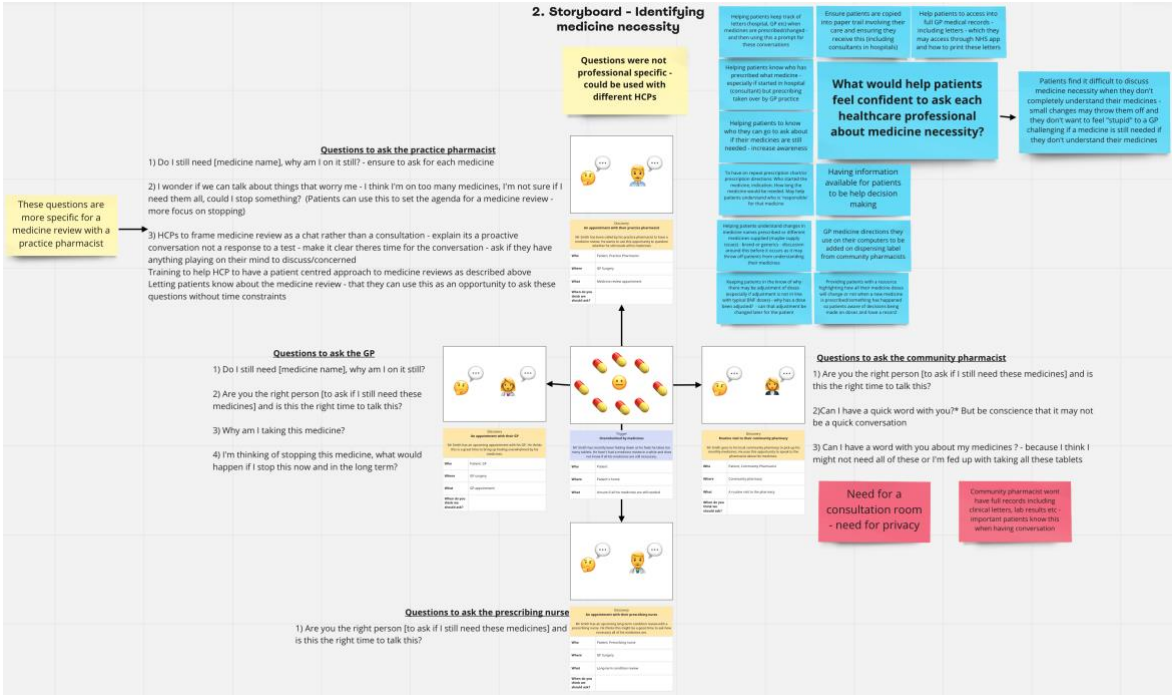
We want to create ideas on how we can make deprescribing occur safely and routinely. We also want to make sure that this works for patients and healthcare professionals. We will be hosting online co-design workshops where we bring together patients, GPs, and pharmacists to develop ideas that make it safe and easy to deprescribe medicines in primary care.

Appendix Y – Co-design Workshop 1 Miro boards

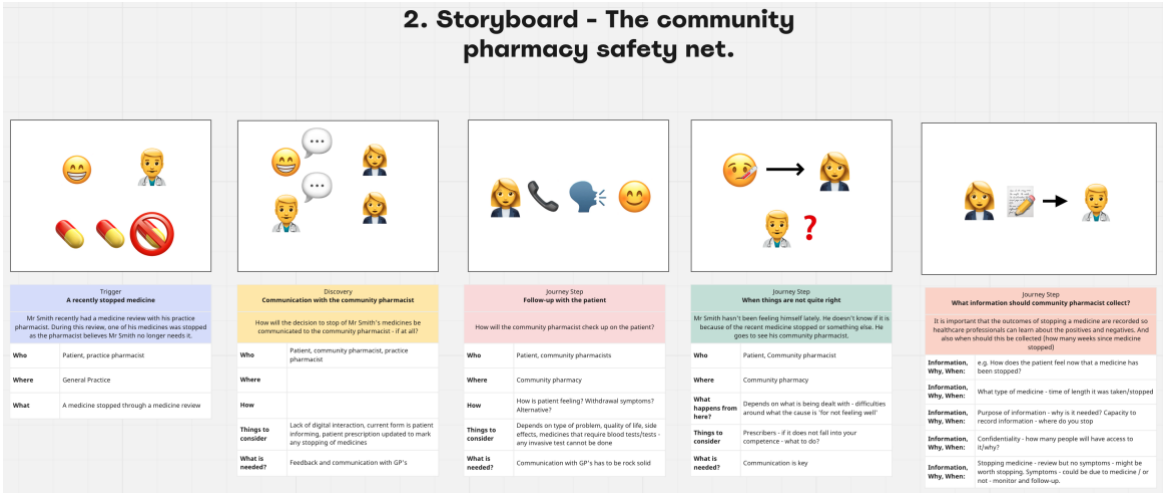


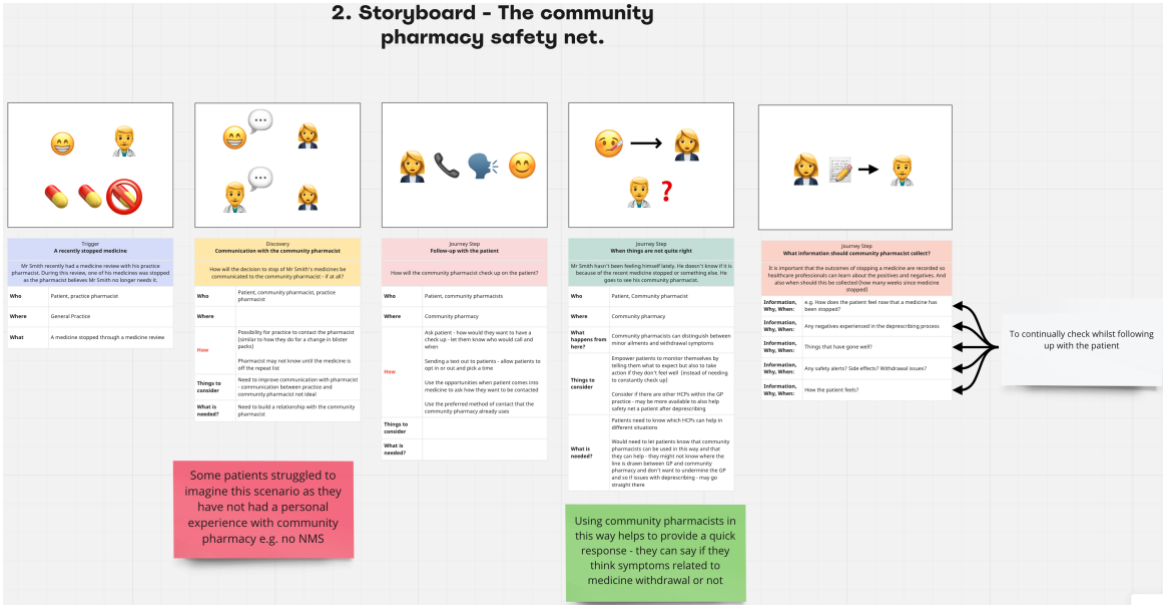

Patient are great advocates for their health, they can be the trigger for stopping conversations
"Do I still need this because ... (insert reason)"
Practical steps with what is in the NHS - the change doesn't need to be ground breaking
Start and stop dates for medicines
Changes in patient circumstances to use as opportunity to review/stop medicines - set examples can help
How do we say its time to stop a medicine?
Sharing good practice worldwide so its standard
Starting these conversations
Patient lines/prompt cards to empower patients to question medicine necessity
Patient's reluctance to challenge GPs
Even harder now as patients don't see Dr's so don't feel a positive relationship
Where can patients go for a quick question on medicine necessity? without needing appointment
National approach needed - so that it is not a fragmented
What would help patients feel confident stopping medicines?
Being clear at point of prescribing about how long/time frames of medicines
A a clear review date when starting a medicine
Reviews to be used to stop medicines
A platform for patients to start a conversation on stopping a medicine - with opportunity for a ring back
Communication
Build in time for reviews
Ensure this a consistent and standard practice
Timing - when to explain/introduce stopping a medicine
How can a patient query if medicine is needed?
Tactical introduction of idea - when you're with Dr rather than phone call/ with other staff
Explaining the medicine e.g. pro's and cons - explaining risk and having shared decision
Information - patient feels empowered to make a choice
Positive use of pharmacists reviews to provide information to patients
Source of information for patient queries on medicines
Reviewing every prescription twice a year
Need to make known the use/skills of pharmacists in the community
Different forms of information on stopping - and keep giving, timely, manageable
Group 2 Idea board

Appendix Z – Co-design Workshop 2 Medicine necessity questions boards



Appendix AA – Co-design workshop 2 community pharmacy safety net boards





Appendix AB – AHSN SMR Invite letter

Text box for GP practice
name and address

Dear <name of patient>

Reviewing your medicines

The practice is running a new service to help you with your medicines - this is called a medication review.

A medication review is a chance to check that your medicines are the best ones for you.

What will happen at the review?

- You will have a face-to-face appointment or telephone call with the practice pharmacist or GP.
- They will check your medicines are working - and not causing side effects.
- It is also a chance for you to tell us how you are getting on with your medicines - and to ask questions and find out more about them.

What happens next?

We will contact you to make an appointment to speak with the practice pharmacist or the GP at the practice or over the telephone.

- The pharmacist or GP will explain what your medicines are for.
- They will check if any changes to your medicines are needed.
- There will also be a chance to have your questions answered.

If someone helps you with your medicines, it may be helpful for them to be with you when you speak to the practice pharmacist.

Why are we doing this?

We are doing this to make sure that your medicines are the right ones for you.

- The purpose of the review is not to save money.
- Also it is not to check if you are taking your medicines.

No medicines will be altered without agreement between you and the pharmacist or GP.

On the other side there are some questions you might want to ask about your medicines at the appointment.

Text box for name and signature

NIHR | Yorkshire and Humber Patient Safety Research Collaboration

ageUK

The AHSN Network

NHS

Questions to think about before the appointment that you may wish to ask

See other language versions

NIHR | Yorkshire and Humber Patient Safety Research Collaboration

ageUK

TheAHSNNetwork