**Exploring factors that affect the uptake and sustainability of videoconferencing for healthcare provision of older adults in care homes**

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**Outputs**

**Papers**

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**National and international conferences**

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This was a three-day conference that allowed researchers to showcase innovative methods in the development of realist evaluation: for example, the possibility of being able to combine realist evaluation methods with randomised control trials and process evaluations, demonstrating quality (being transparent and clearly demonstrating causal links in data) and rigor (following RAMSES reporting standards). Ray Pawson also laid out the seven key challenges he wanted to be addressed; for example, how to use programme theory as the unit of evaluation to make lessons more transferable, looking at evaluation at a policy level, and better visualising realist theories and explanations. There was also a large presence of PhD students, and workshops to help support shared learning and networking.

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Abbreviations and definitions

CCG Clinical Commissioning Group

CMOC Context Mechanism Outcome Configuration

Context Conditions in which videoconferencing operates; e.g., type of home, staff structure, psychosocial factors. This is deduced by defining a mechanism (Dalkin, 2015)

FEAST Frail and Elderly Assessment Support Team

Mechanism Resource (something the intervention adds) and mechanism (Dalkin, 2015)

ENRiCH Enabling Research in Care Homes Network

Hub The physical location at the remote hospital, where nurses answer video calls (from the care homes)

Mediating A factor that may be affecting the use of videoconferencing, which the care home can influence

Moderating A factor that may be affecting the use of videoconferencing, which the care home cannot influence

RATL Rapid Assessment Time Limited Service

Service The whole package, which includes access to health care professionals and actions available, e.g. triage, advice, support, out of hours GP

ScHARR School of Health and Related Research

Telemedicine Technologies that enable treatment from a distance

The system The videoconferencing technology used to access the hub (e.g. the laptop)

Videoconferencing The system and the service combined

Abstract

**Background:** There are currently 421,100 people aged over 65 living in care homes (Age UK, 2017). With an increasingly ageing population, it is likely that the need for care homes will increase across the country (Smith et al., 2015). This will necessitate the development and assessment of innovative methods for delivering efficient healthcare in care homes (NHS England, 2014a). A rapidly developing and increasingly popular method of delivering health care is videoconferencing, and this has shown promise in addressing these challenges (Hex and Wright, 2015). This thesis aims to explore factors that affect the uptake and sustainability of videoconferencing in care homes in Yorkshire and the Humber, to establish what works for whom, and in which circumstances and respects.

**Methods:** A literature review was conducted to identify the technological terms underpinning this study. This was followed by a scoping review (Chapter 3), which was undertaken to establish the current research available on the use of videoconferencing for remote healthcare provision in care homes globally (Newbould et al., 2017).

Guided by findings from these reviews, a survey (Chapter 4) was developed to identify care home manager's knowledge of and attitudes towards videoconferencing, and to map current provision in care homes in Yorkshire and the Humber. The survey findings were used to identify three care homes for a realistic evaluation, based on comparative case studies (Chapter 5).

**Results:** The scoping review found a wide range of applications for videoconferencing technology in care homes, with the most common being assessment of resident health. Additionally, most of the research was identified as originating from countries with large, sparsely populated geographical areas. The survey found that videoconferencing was rated highly for most aspects, apart from accessibility, which was considered a problem by one care home. The majority of respondents that had not had experience were distrustful of the technology. However, respondents that did have experience reported being happy with the service provided. However, one of the main drivers of uptake appears to be access to services currently available and perceived relative advantage. From the in-depth case studies (Chapter 6), it was established that where change efficacy (perceived ability to affect change) and change commitment (shared vision to implement change) were high, there was a supportive context for uptake and sustainability. Factors that affected change efficacy and change commitment appeared to be care home culture, research champions, and access to knowledge, training, and expertise.

**Discussion:** The findings from the thesis demonstrate that videoconferencing is a viable tool where certain organisational prerequisites exist. The thesis suggests that more research should be undertaken to address the readiness of care homes to implement new interventions. Additionally, there needs to be more funding and greater focus on policy for getting research knowledge into practice.

Chapter 1: Introduction

Overall aims of the research

To explore the factors affecting the uptake and sustainability of videoconferencing in care homes in Yorkshire and the Humber, to establish what works for whom, in which circumstances and respects.

* + 1. Objectives

1. Identify the extent and nature of the available evidence
2. To explore the use of videoconferencing to access healthcare in care homes within Yorkshire and the Humber
3. Select three care homes for further study with differing characteristics and use of videoconferencing
4. Identify and describe factors that lead to the successful uptake and sustainability of videoconferencing, from all the strands of inquiry

There is an increasingly ageing population in the UK (Care Quality Commission, 2017). As a result, there is an increasing demand on care homes (Smith et al., 2015). Combined with funding cuts, this is proving to be a challenge for healthcare provision in care homes (Unison., 2016). Videoconferencing has been suggested as one way of addressing this problem (Hex and Wright, 2015).

Research into the use of videoconferencing is sparse, with over 50% of studies being small-scale case studies (Chapter 3). However, despite the varying quality of research, videoconferencing has shown itself to be feasible in this setting (Czaja, 2016). Despite this, great variability has been seen in the uptake of technological interventions in care homes (Hall et al., 2017), which is attributed to a range of factors (Goodman et al., 2017c). This thesis aims to explore factors that affect the uptake and sustainability of videoconferencing, to inform commissioners and strategic managers of the best way to implement the system and increase use.

This chapter provides a background to the ageing demographic in the UK. It looks at current healthcare provision in care homes and challenges to health care provision. It then looks at available technology in care homes, before outlining factors that have been shown to affect the uptake of technology in this setting.

Older adults in the UK

Age UK recently reported that there are now 11.8 million people in the UK over the age of 65 (Age UK, 2017). In England, it is predicted that the number of people over the age of 85 will double in the next two decades, with approximately a third of these having difficulty with five or more daily tasks necessary to live without utilising care services (Care Quality Commission, 2017).

Increasing life expectancy has been attributed to factors that include improvements in public health, preventative care, and diet (Royal Geographical Society with IBG, 2015). However, an ageing population brings with it new challenges, such as an increase in the number of people with complex health needs. Many older adults have multiple comorbidities and disabilities, and are increasingly frail (Oliver et al., 2014). The Office of National Statistics (ONS), as reported by Age UK (2017), states that four million people in the UK have a long-term condition, with 40% of these being over the age of 65, and that 59% of people aged over 80 have a long-standing illness or disability (Age UK, 2017).

The recent work of Laing and Busson suggests the number of adults aged over 65 now living in care homes is 421,100 (Age UK, 2017). Many of these individuals will have made the decision to move based on the nature of their needs, with many enduring a disability that can no longer be supported in their own home (Martin et al., 2011, Goodman et al., 2015). Therefore, it is likely that the need for care homes will increase across the country (Smith et al., 2015). This inevitable increase will necessitate the development and assessment of innovative methods for delivering efficient health care in care homes (NHS England, 2014a).

Care homes are defined by the Care Quality Commission (CQC) as, 'any nursing or residential home registered with the Quality Care Commission where mainly older people live' (Care Quality Commission, 2015). They state that, 'Residential homes provide care and support day and night, and help is provided for activities of daily living, such as washing, dressing, at meal times and with using the toilet. Nursing homes offer the same care as residential homes, but also have 24-hour medical care from a qualified nurse and are for residents who are more dependent' (Care Quality Commission, 2015). Individuals who require regular daily nursing care or specialist care in certain conditions are eligible for admission to a nursing home (NHS Choices, 2015).

* 1. Health care provision to care homes

Care home residents typically have complex health needs, but the quality and access to healthcare services for residents varies considerably (Martin et al., 2011).

The 'Quest for Quality' Report by the British Geriatric Society (2011) discussed the variability in healthcare provision in care homes, claiming there were no specific models for provision to care homes. It states that each residents' care is the responsibility of their GP, with some homes having a dedicated GP with local arrangements dependent on practicalities and geography (Donald et al., 2008). However, it is unusual for primary care to be personalised to the requirements of a specific care home, with there also being no common consensus between commissioners as to what services should be delivered and/or what the needs of the residents are (Martin et al., 2011).

The most common model of healthcare delivered by GPs generally involves the GP visiting the care home once a week. Care is managed through face-to-face contact with the resident, telephone calls to staff, and remotely accessing patient records (Gladman, 2010), with the GP making referrals to specialist services when required (Goodman et al., 2014). However, some homes have entered into a 'Local Enhanced Service' (LES) agreement with practices, where they pay for a higher level of care (Gordon et al., 2014). 'Personal Medical Services' (PMS) have been set up in some areas where there is a lack of GP provision, with employed GPs working solely for the care home (Gordon et al., 2014). The Quest for Quality Report (2011) went on to state that one of the main challenges was getting services/healthcare professionals to work with care homes, as many are unwilling. This has been attributed to workload and lack of expertise and recognition (Martin et al., 2011) Other research by Barodawala et al. (2001) found inequalities in care provision, with many care homes unable to access allied health professionals, such as physiotherapists and occupational therapists (Barodawala et al., 2001).

* 1. Challenges to care provision

As a result of the demographic shift and increase in long-standing illnesses, the rising pressure on healthcare and social care services is unsustainable (Royal Geographical Society with IBG, 2015).

There are also increasing financial constraints on the care home sector. This has been attributed to a lack of local authority funding and an increasingly ageing population (Unison., 2016) resulting in homes lacking the budget for the staff required to meet demands, and thus increasing staff turnover (Griffiths et al., 2017). Staff turnover rates are reported to have increased by 5% since 2015 (Age UK, 2017), creating obstacles to care homes providing high quality care. Differences in staff retention have been attributed to the recruitment process, employee voice, staff motivation to undertake care work, and workers autonomy and discretion (Rubery et al., 2011).

Poor staff retention can reduce the safety of residents in the care home. Of five key indicators used to assess the quality of care homes by the Care Quality Commission (CQC), safety was awarded the poorest rating. In the recent report, 'The State of Adult Social Care Services 2014-2017', published by the CQC, 23% of homes were rated as 'needs improvement' and 25% as 'inadequate'. Poor safety can also be due to poor management of medicines and being unable to offer good person-centred care (Care Quality Commission, 2017).

It has been suggested that inadequate management of medical care in care homes could result in residents being admitted to hospital and dying there unnecessarily, when they could otherwise be treated or die in their current place of residence (Martin et al., 2011). The National Audit Office (2008) estimated that the proportion of residents having died in hospital could have been reduced by 20% if alternative care pathways had been followed (National Audit Office, 2008). In addition, emergency admissions to hospital are expensive (Hex and Wright, 2015); they expose older adults to new psychological and clinical risks; they increase dependency; and they are an unsettling experience for the individual (Imison et al., 2012).

Better management of healthcare could also aid the reduction of hospital admissions, which would mean lowered costs and improved quality of care for older adults (Smith et al., 2015), allowing more residents to achieve what 'The End of Life Strategy' (2008) defines as a 'good death'. This would involve, 'the resident being treated as an individual with dignity and respect, without pain, in familiar surroundings and with close family and/or friends' (Department of Health, 2008) (pp.9).

As the traditional model of care is reported to be failing many residents (Smith et al., 2015), it is paramount that new, more appropriate, efficient and cost-effective models of care are developed (NHS England, 2014a).

* 1. Digital technology as a means of improving the quality and cost effectiveness of health care for care home residents.

In October 2014, the 'Five-Year Forward View' for the NHS was published in the context of constrained resources and increasing demand. The key priorities laid out in the document are: 'the personalisation of care, new models of care and integration, effective management of services, and reshaping the workforce' (HM Government, 2014). The Five-Year Forward View (NHS England, 2014a) emphasises the importance of reducing variation in the quality of healthcare by delivering new care models that harness the benefits of new technology and are adapted to the needs of the population (NHS England, 2014a).

In the Five-Year Forward View report, NHS England provides funding for sites to support the implementation of six New Care Model Vanguards for enhanced care in care homes. These models aim to offer older people 'better joined-up healthcare and rehabilitation' (NHS England, 2015). These models demonstrate the rise in the use of telemedicine to increase access to healthcare, in particular the use of videoconferencing as a method of delivering care closer to home (Cruickshank and Paxman, 2013). These six models are: Connecting Care (Wakefield District), Gateshead Care Home Project, East and North Hertfordshire Clinical Commissioning Group (CCG), Sutton Homes of Care and Airedale & Partners (NHS England, 2015). Of the six vanguards, two are using videoconferencing for healthcare delivery (see 6.3).

A report from the Social Care Institute for Excellence (SCIE) roundtable discussion on 'How technology can support the goals of the Care Act' (Social Care Institute for Excellence, 2015) stated that, in addition to helping meet the aims of the Five-Year Forward View, the use of technology could support the goals of the Care Act through 'empowering patients to choose the right care for them, enabling health professionals to see what care patients are currently accessing, and allowing quicker access to records and histories'. The report goes on to discuss how technology could be used to complement, rather than replace personal care (Social Care Institute for Excellence, 2015).

A range of telecare technologies have been demonstrably successful in enhancing health and care previously (Law and Padgham, 2011, Department of Health Care Networks, 2010). For example, Eccles (2012) explored the use of falls detectors and sensors for beds/chairs as a way of improving the safety of care home residents, demonstrating that these sensors reduced fall rates by 37%. This resulted in cost savings for the NHS, and the improved care and increased confidence of residents when mobilising (Eccles and Anderson, 2012, Department of Health Care Networks, 2010, Greenhalgh et al., 2015). The announcement of the vanguard models was also in accord with the uptake on new technologies to support health care (NHS England, 2015, NHS England, 2016).

More recent research also found that the use of technology for managing health activities in care homes was beneficial (Czaja, 2016, Williams et al., 2017). One example was the use of electronic medical system records, which were shown to increase productivity and efficiency in nursing homes in New York (Hitt and Tambe, 2016).

Videoconferencing (a live two-way audio visual link between the care home and healthcare provider) has been shown to improve links and access to remote health professionals by: removing geographical barriers to care (Johnston and Jones, 2001); improving access to a range of services and encouraging continuity of care (Coelho et al., 2005); improving access for those who may have physical disabilities (Cruickshank and Paxman, 2013); and allowing the opportunity for residents to be assessed before deciding if they need to be admitted to hospital (Hex and Wright, 2015). It can also enhance access to primary care (NHS England, 2015, NHS England, 2016); it is adaptable to the health needs of the population; and it enables the delivery of support 24 hours a day, seven days a week, from clinicians at a remote site (Cruickshank and Paxman, 2013). It has also been said to improve staff confidence (McGibbon et al., 2013) and to allow residents a 'good death' in the surroundings of their home and family (Low et al., 2013), as described by the End of Life (Department of Health, 2008).

More recent research on the use of videoconferencing in the Scottish Highlands was undertaken to test the impact of remote psychiatric clinics on resident care (Hall et al., 2016). The results indicated faster access to services, better monitoring of patients, and quicker treatment reviews, with the consequence that the residents received more responsive treatment. The service also helped to develop the knowledge of care home staff (Hall et al., 2016).

The most recent applications of telemedicine, particularly videoconferencing, was for direct patient benefit in care homes (Cruickshank and Paxman, 2013). Internal evaluations (Coletta, 2014) and an evaluation conducted by the York Health Economics Consortium both indicated that it showed promise for reducing hospital admissions, bed stays, and A&E attendances for older people (Hex and Wright, 2015). Little is known about any potential drawbacks of the service in the UK, or in what situations and/or conditions videoconferencing would be most feasible.

* 1. Conflicting evidence for the use of telemedicine for remote health care provision

Although telemedicine has shown promise in reducing barriers in access to health care (Czaja, 2016) others have found there to be limited potential. For example, a Cochrane Review by Flodgren et al. (2015) assessed the effectiveness and the acceptability of interactive telemedicine, including remote telemonitoring and videoconferencing for people with a range of health problems, such as cardiovascular and mental health problems. The study concluded that telemedicine leads to similar outcomes to those who used face-to-face or telephone delivery interventions in those with cardiovascular disease and noted that the acceptability of telemedicine to patients and health-care professionals was unclear due to limited data (Flodgren et al., 2015).

Reports on the use of videoconferencing from the York Health Economics Consortium (YHEC; previously discussed) (Hex and Wright, 2015) and Scarborough and Ryedale Clinical Commissioning Group (CCG) (Garnett and Hanson, 2016) have also reported conflicting evidence on the use of videoconferencing. The Hex and Wright (2015) report aimed to evaluate the telehealth interventions being delivered in Airedale, Wharfedale and Craven using observational ‘before’ and ‘after’ data. The report suggested that although videoconferencing was shown to reduce hospital admissions from care homes, the data presented in the report also suggested there was an increase in mortality for those who were admitted after non-elective admissions. However, given the lack of robustness of the data analysed in the report, there is a question over attribution and whether other factors may have been responsible for the observed outcomes (Hex and Wright, 2015). Scarborough and Ryedale CCG also removed the pilot scheme from the care home sites that were trialling videoconferencing after data on admissions revealed that homes that implemented videoconferencing saw an increase in the number of residents being admitted to hospital. However, this evaluation used postcode data; meaning admissions were identified from a certain geographical area, but could not be clearly identified as being from the care homes and so findings could be attributed to admissions from local residential areas. This makes it difficult to attribute the increase in admissions to the care homes in the area and the use of telemedicine (Garnett and Hanson, 2016).

Mclean et al. (2013) conducted a systematic review to inform policy on the use of telehealthcare applications. They found that telehealthcare (defined as the use of synchronous or asynchronous technology to provide care at a distance) yielded the most benefit in those with the most severe long-term conditions who are most at risk of more serious outcomes and would not necessarily deliver benefits in outcomes otherwise. However, this paper also noted the difficulties in disentangling organisational and human processes and the effect these might have on outcomes when implementing telehealthcare. As a result, the paper suggested using realist evaluation as a method to better understand the implementation of the technology in future research (McLean et al., 2013).

Another review has also been carried out on asynchronous (store and forward) and synchronous (live data, such as videoconferencing) teleconsultation on behavioural, clinical and care coordination outcomes for those with diabetes. This review found that although the technology appeared to be reliable and feasible, many of the included studies showed no significant difference between the technology and control groups. However, this review highlighted that most of the available research used a Randomised Control Trial (RCT) design, which has been suggested to impede investigation, particularly in terms of the outcome measures used as they lack the detail of what works for whom in what circumstances and respects (Verhoeven et al., 2010, Pawson, 2013).

Finally, Mair et al. (2012) conducted a systematic review exploring the barriers and facilitators to the implementation of e-health and identified research gaps. The review concluded that more focus needs to be given to how e-health affects staff roles and responsibilities, what affect it has on risk management, how best to engage with professionals and how to make the potential benefits of technologies transparent through evaluation. It also noted limitations as the identified research was of poor quality and primarily from North America (Mair et al., 2012).

* 1. Factors affecting provision of technology in care homes

Though technology has been shown to help improve access to care in care homes (Czaja, 2016), there is great variation in the uptake and sustainability of technological interventions (Hall et al., 2017).

Work undertaken by Goodman et al. (2017) explored factors increasing care homes' readiness for change. The work concluded that leadership and culture were the two most important factors when identifying the care homes most likely to engage with new interventions. The research showed that leaders who were present and engaged in the care home were the most effective at affecting change. In addition, adequate staffing, time for training, feedback, and resources were pertinent to the development of a positive care home culture, which is necessary for successful engagement with new technological interventions (Goodman et al., 2017c).

Variability in uptake has also been linked to greater discussion with stakeholders and more in-depth training, thus aiding understanding of the reasons for use and the anticipated outcomes (Hall et al., 2017).

Factors seen to affect the uptake of telemedicine in older adults include: the opinion of the doctor; the conditions in which the facilitation is happening; anxiety related to the technology; perceived security and usefulness; the expectations for required effort; and the influence of others (Cimperman et al., 2013).

In summary, with many people now living much longer (World Health Organization International, 2012), there will inevitably be an increase in demand for care homes (Smith et al., 2015). This, combined with limited resources, means it is paramount that new and innovative ways of delivering healthcare are developed to meet this challenge (NHS England, 2014a). Videoconferencing may be one such method (NHS England, 2015, NHS England, 2016). However, work should be undertaken to establish which factors affect the uptake and sustainability of videoconferencing in care homes.

The thesis is structured as follows:

**Chapter 1:** The aims and objectives of the project are presented in this chapter, this is followed by a background to the ageing population in the UK and what this means for care provision, current provision of health care to care homes, and how technology can be used to help address the challenges faced.

**Chapter 2:** In this chapter, the definitions of telemedicine and related terms are explored. This is to underpin the terms for this project and provide a foundation for the development of a search strategy for the scoping review in chapter 3.

**Chapter 3:** The availability of current research literature for videoconferencing in care homes is charted in a scoping review. This is to identify evidence available in the UK and elsewhere.

**Chapter 4:** The development, dissemination and findings of a survey that was sent out to care homes caring for older adults in Yorkshire and the Humber is reported on.

**Chapter 5:** This chapter reports on the methods used to undertake the realist evaluation and the grand and middle range theory used to develop the programme theory.

**Chapter 6:** The results of the comparative case studies are reported in this chapter. The chapter is divided in to the three case studies. Each case study is preceded with a brief rationale for the selection of the care home for the case study and the background to the home.

**Chapter 7:** The discussion consolidates the findings from the PhD, it highlights the contribution of this thesis to knowledge and how this project created the potential for impact. The strengths and limitations of the project are then outlined, alongside the views of care home staff and residents on their perceived challenges to undertaking the research. These views of care home staff were obtained as part of an undergraduate project supervised by the PhD researcher who secured this additional research funding. This project was seen as being integral to this thesis as it enabled a broader and more holistic view of challenges faced in care home research; it will be used to inform the future work of ENRiCH who supported this project. Finally, this chapter outlines recommendations for policy and practice before concluding.

To establish the breadth of research already available on the use of videoconferencing, a scoping review was undertaken. However, this was preceded by a literature review on the definition of telemedicine, to clarify search terms and to define telemedicine for this project.

Chapter 2: Defining Telemedicine: A Literature Review

The previous chapter discussed how an increasingly ageing demographic is impacting on the prevalence of complex healthcare needs and the challenges faced in meeting this demand. It then went on to explain how different forms of technology can be used to help improve access to healthcare. However, there are various different types of technology and an array of different terms being used to describe technological interventions, with many types having overlapping concepts with others. This chapter provides an overview of the terms used in healthcare technology, and how telemedicine and videoconferencing fit amongst these. This was conducted to define the terms used for this project.

The chapter initially provides some background to telemedicine, followed by the aims and objective for the review, then the findings and discussion and conclusion.

* 1. Introduction

Since its introduction in 1975, telemedicine has been defined in a variety of ways (Nymo and Skåtun, 1993). It is described using a range of terms, with many professions having their own definitions. Eng (2001) says, 'There are a range of terms used to describe information technology in healthcare which include; ehealth, medical informatics, telehealth, and interactive health communication' (Eng, 2001)\*.

\* When attempting to obtain the page number for this quote, the researcher was informed this resource had been removed.

This was noted to be a problem, as many experts use different terms, and many of these have overlapping definitions (Eng, 2001). In addition, there are a range of global concepts used to describe use of information communication technology in health services (US Department of Health & Human Services, 2008). Therefore, a review of the literature was conducted to determine the terminology most appropriate to this project.

* 1. Aim

The aim of this section is to establish how best to define telemedicine for this project, and to establish how telemedicine fits with interrelated and umbrella terms.

* 1. Objectives

1. Undertake a literature search to identify the range of definitions of telemedicine
2. Identify terms that are used interchangeably
3. Identify and explore umbrella terms that encompass telemedicine
4. Use review findings to identify the terms used within this thesis
   1. Method

The initial intention was to search Medline, OvidSP, EMBASE, and Web of Knowledge. However, an initial search on EMBASE and Medline revealed that there were too many papers to search given the short time frame. Therefore, a retrospective literature search was conducted from 2015. The term ‘telemedicine’ was used to searched in Cochrane Database of Systematic Reviews initially. The resulting nine hits were then scrutinised to identify the definitions used. Two papers with definitions were identified, the definitions were then traced back to their origins to identify the original sources. Where the search identified terms that were related, interrelated, and used interchangeably with telemedicine, these terms were also searched, tracing their definitions back to their original sources. Additionally, each term was searched on Google. The first three pages of hits were searched to identify definitions and terms used in the field of technology innovation. The first three pages of websites were searched for definitions, and websites were assessed and considered alongside an evaluation checklist, before including them in the review (Leeds University Library, 2015). Any new terms that arose from the Google search, were also retrospectively reviewed in the Cochrane Database of Systematic Reviews (De Monfort University, 2015). This was updated in 2017 with terms searched in Cochrane Database of Systematic Reviews prior to 2016, but the definitions were not traced back or searched on Google. The search was undertaken to identify any new terms that had arisen since undertaking the project. Search terms were not searched online, due to time constraints and the quality of the evidence available in the original search.

Cochrane is an independent, non-profit organisation that conduct systematics reviews of healthcare interventions (Health Research Board, 2016). Cochrane Database of Systematic Reviews were selected as the search method as they have been shown to influence primary research and the development of knowledge (Bunn et al., 2015).

* 1. Findings

All terms identified from the Cochrane Database of Systematic Reviews are listed below in table 1:

Table Table breaking down article search in Cochrane Database of Systematic Reviews and articles from where definitions derived

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Search term** | **Hits** | **Number of definitions** | **Articles from which definition derived** | **No. of definitions in derived articles** |
| **General terms** |  |  |  |  |
| Telemedicine | 9 | 2 | 67 | 22 |
| Ehealth | 0 | 0 | 0 | 0 |
| Medical informatics | 2 | 0 | 0 | 0 |
| Consumer health informatics | 1 | 0 | 0 | 0 |
| Public health informatics | 7 | 0 | 0 | 0 |
| Telehealth | 3 | 0 | 0 | 0 |
| Interactive health communication | 5 | 1 | 6 | 2 |
| Teleconference | 65 | 0 | 0 | 0 |
| Teleconsultation | 2 | 1 | 6 | 4 |
| Telemonitoring | 7 | 0 | 0 | 0 |
| Telepresence | 7 | 0 | 0 | 0 |
| Self-care applications | 15 | 0 | 0 | 0 |
| **Clinical field specific** |  |  |  |  |
| Teleradiology | 3 | 0 | 0 | 0 |
| Teledermatoloy | 2 | 0 | 0 | 0 |
| Telepsychiatry | 2 | 0 | 0 | 0 |
| **Terms derived from teleconsultation** |  |  |  |  |
| Videoconference | 56 | 1 | 1 | 0 |
| Telediagnosing | 0 | 0 | 0 | 0 |
| Telecare | 2 | 0 | 0 | 0 |
| Telesurgery | 1 | 0 | 0 | 0 |
| Telesurvellance | 1 | 0 | 0 | 0 |
| **Terms derived from websites** |  |  |  |  |
| Health informatics | 3 | 0 | 0 | 0 |
| Biomedical Informatics | 2 | 0 | 0 | 0 |
| Healthcare informatics | 1 | 0 | 0 | 0 |
| Health Information technology | 78 | 0 | 0 | 0 |
| Consumer e-health | 5 | 0 | 0 | 0 |
| Video cast | 6 | 0 | 0 | 0 |
| Videoconference interpreting | 0 | 0 | 0 | 0 |
| Technology Enabled Care Services | 17 | 0 | 0 | 0 |
| Digital health | 32 | 0 | 0 | 0 |
| Tele coaching | 3 | 0 | 0 | 0 |

It became apparent after the initial search in the Cochrane Database of Systematic Reviews that since the prefix *telos* meant 'at a distance', any clinical profession could become 'tele mobile' (Preston et al., 1992). It was for this reason that some of the search terms below were subsequently excluded. This included the following terms: clinical field specific section, telediagnosis, telecare, telesurgery, telesurvellance, and telecoaching.

Summary table for term citation in websites:

Table 2 Number of hits and definitions of terms available via websites

|  |  |  |
| --- | --- | --- |
| **Search term** | **Hits** | **No. of definitions** |
| **General terms** |  |  |
| Telemedicine | 26 | 5 |
| Ehealth | 29 | 4 |
| Medical informatics | 29 | 5 |
| Consumer health informatics | 29 | 12 |
| Public health informatics | 29 | 2 |
| Telehealth | 29 | 5 |
| Interactive health communication | 30 | 2 |
| Teleconference | 24 | 11 |
| Teleconsultation | 29 | 13 |
| Telemonitoring | 28 | 9 |
| Telepresence | 23 | 6 |
| Self-care applications | 29 | 0 |
| **Terms derived from teleconsultation** |  |  |
| Videoconference | 27 | 6 |
| **Terms derived from lay literature** |  |  |
| Health informatics | 30 | 2 |
| Biomedical informatics | 0 | N/A |
| Healthcare informatics | 0 | N/A |
| Health information technology | 25 | 9 |
| Consumer e-health | 0 | N/A |
| Video cast | 0 | 0 |
| Videoconference interpreting | 29 | 3 |
| Technology enabled care services | 30 | 3 |
| Digital health | 29 | 4 |

Upon completing this project, the original search terms included in Table 2 were re-run in Cochrane Database of Systematic Reviews (Table 3). This was to establish if the terms had changed, and to identify any new terms that have come into use since.

Table 3 Terms searched on Cochrane Reviews for new definitions from 2016 and definitions/new terms available

|  |  |  |
| --- | --- | --- |
| **Search term** | **New definitions identified since 2016>** | **Definitions** |
| **General terms** |  |  |
| Telemedicine | 1 | 0 |
| Ehealth | 0 | 0 |
| Medical informatics | 0 | N/A |
| Consumer health informatics | 0 | N/A |
| Public health informatics | 5 | 0 |
| Telehealth | 1 | 0 |
| Interactive health communication | 4 | 0 |
| Teleconference | 0 | N/A |
| Teleconsultation | 0 | N/A |
| Telemonitoring | 0 | N/A |
| Telepresence | 0 | N/A |
| Self-care applications | 3 | 0 |
| **Terms derived from teleconsultation** |  |  |
| Videoconference | 0 | N/A |
| **Terms derived from lay literature** |  |  |
| Health Informatics | 0 | N/A |
| Biomedical Informatics | 0 | N/A |
| Healthcare informatics | 0 | N/A |
| Health Information technology | 0 | N/A |
| Consumer e-health | 0 | N/A |
| Video cast | 0 | N/A |
| Videoconference interpreting | 0 | N/A |
| Technology-enabled care services | 2 | 0 |
| Digital health | 11 | 0 |
| **New terms identified from search** |  |  |
| Clinical information-system interventions | 4 | 1 |
| Assistive technology | 5 | 2 |
| Automated telephone communication systems (ATCS) | 1 | 1 |
| Remote and web based interventions | 2 | 1 |
| Mobile clinic | 2 | 1 |
| Electronic assistive technology | 1 | 0 |

Table 3 shows that there were no new defintions identified for the original search terms (2015). However, some new terms to describe different types of technology were identified.

* 1. Discussion
     1. Umbrella terms

Umbrella terms to encompass the use of technology in healthcare could be identified. The first of these was 'e-health', which provides a broad definition of the use of information and communication technology in health (World Health Organisation, 2017). A more comprehensive definition comes from The European Commission (2012), which states,

*'e-health' covers the interaction between patients and health service providers, institution to institution transmission of data, or peer to peer communication between patients and/or health professionals. Examples include health information networks, electronic health records, telemedicine services, wearable and portable personal health systems and many other information and communication technology (ICT) based tools assisting disease prevention, diagnosis, treatment and follow up (European Commission, 2012) (pp. 1).*

The SPICe (Scottish Parliament Information Centre) briefing paper (2013) goes on to explain that e-health can refer a range of programmes and initiatives for different groups, explaining that the definition encompasses various IT solutions, such as 'health informatics', 'telehealth' and 'telecare' (Payne, 2013). Digital health definitions followed a similar theme, emphasising the use of any healthcare technologies or delivery that occurred using digital space (Nuviun., 2015).

'Technology-enabled care services' (TECs) also emerged as an umbrella term. Three definitions identified from websites were almost identical. These included a quote from the NHS Commission Assembly (2015), stating 'TECS incorporates telehealth, telecare, telemedicine/teleconsultations, telecoaching and self-care apps and are designed to complement other technology services such as integrated care records and unified communications' *(Commissioning Elf, 2015)(pp. 1).*

'Interactive health communication' was a third all-encompassing term. This is defined as,

*The interaction of an individual – consumer, patient, caregiver, or professional – with or through an electronic device or communication technology to access or transmit health information or receive guidance and support on a health-related issue (Eng et al., 1999)’(pp. 10).*

Finally, 'medical informatics' was identified as an umbrella term, meaning the design, development, and application of IT for the management and planning of health services (Information and Society and Management, 2014, Health Services Research Information Central, 2015). For example, health informatics (NHS Careers, 2015), public health (Hopkins, 2015, American Medical Informatics Association, 2015), and consumer health informatics are defined as different branches of health informatics. Health informatics helps the consumer to analyse and access the information they would like about their own health (Eysenbach, 2008, Lewis et al., 2005). Terms surrounding health informatics also link to health information technology. Identified definitions suggest that medical informatics is a generic term for, 'the exchange of health information in an electronic environment' *(US Department of Health & Human Services, 2008) (pp. 1),* with some definitions explaining that the term refers to a framework for managing health records in a digital format. This suggests these terms are used interchangeably (American Health Information Management Association, 2014, Education Portal, 2015). When the search for health informatics was re-run in 2017, a new expression, 'clinical information-system interventions',was used and defined (Ciapponi et al., 2017). Ciapponi et al. define this term as,

*'information systems to organise patient data in order to improve the delivery of*

*care, for example by developing schedules for patients with certain conditions, audit and feedback, change in medical records systems or reminders* *(Ciapponi et al., 2017). ‘(pp. 16)*

This definition was also used as an umbrella term in a review conducted by Pasricha et al.

(2013).

This term encompassed 'decision support and clinical information systems'. Decision

support interventions included interventions for case-based discussions and

communications. 'Clinical information systems' are information systems for organising data ,

thus improving care, e.g quality monitoring, reminders, changes in medical records, and audit

feedback (Pasricha et al., 2013). This term appeared to be more in line with definitions

related to health informatics identified in the initial search, as it is in line with analysing and

access information about an individuals own health (Eysenbach, 2008, Lewis et al., 2005).

Therefore, this term may now be used instead of or as well as health informatics.

* + 1. Telehealth, telecare and telemedicine

Discrete terms within definitions of digital health and technology enabled care services were then identified; they included telehealth, telecare and telemedicine. These three terms are often used interchangeably as they are overlapping concepts, despite having different meanings (Eng, 2001). Many definitions of 'telecare' refer to supporting independence in the home, with devices such as alarms and environmental sensors (Telehealthcare, 2017, Telecare, 2017, CareChoicesLtd, 2017, TelecareChoice, 2016, TeleCare, 2017, NHS Choices, 2014, Circle Centra, 2017, Living Made Easy, 2017, Disabled Living Foundation, 2013, Mountain et al., 2017, Independent for longer, 2017), with remote monitoring being a frequent feature (NHS Choices, 2014, Nuffield Trust, 2012). Telehealth is concerned with remote monitoring of patients' vital signs and symptoms using technology in their homes. The remote monitoring aspect is where telehealth and telecare appear to overlap. Another term cited within the definitions is 'tele-monitoring', whereby data is transmitted about the patient's health status to a remote healthcare setting (Riley et al., 2013, Pandor et al., 2013, Wise, 2003, Centre for Connected Health and Social Care, 2013, Yorkshire & Humber Health Innovation and Education Cluster, 2012, Paré et al., 2007, Partners Health Care at Home Inc, 2013).

When the search was re-run in 2017**,** a new paper defined the term 'assistive technology'

as an ICT-based device, developed to help people with disabilities become better included in

society (Van der Roest et al., 2017). This paper refers to other work in which it is suggested that there is no clear definition or consistency in the use of the term, and suggests that the impact of assistive technology will only be known once the term is clearly defined (Peterson et al., 2012). When searching for this term seperately, no other definitions were established. However, via this search, 'remote and web-based interventions' was identified as a new term.

The new terms identified were: cognitive prosthetics, electronic assistive technology (EAT), telecare, pervasive computing, and technology-based reminding support (McCabe et al., 2017). No defintions were identified for electronic assistive technology, cognitive prosthetics, pervasive computing, or technology-based reminding support. The only information available was that these terms were being used interchangably with 'assistive technology' (Van der Roest et al., 2017). However, the fact that the term was linked to 'telecare' suggests that these types of technologies may have overlapping concepts.

Another new term identified was 'automated telephone communication systems' (ATCS)

as a new term (Posadzki et al., 2016)**.** These were defined as 'applications that have been

used to deliver both preventive healthcare programmes as well as services to manage long-

term conditions'(Posadzki et al., 2016) (pp. 7),and the paper included examples of undirectional ATCs (interaction that is one-way and does not require interaction), ineractive ATCs (two-way real-time communication through technology such as interactive voice response (IVR)), and ATCs plus (interactive, but have additional functions, e.g. allows access to an advisor to ask questions).

This term is used to define real-time synchronous communication: a live two-way link,

happening in real time, with two people speaking to each other at the same time (IGI Global, 2017).However, it is done though an automated system, and without speaking

directly to another professional. Therefore, this fits more with the definitions previously

given for telecare (Telehealthcare, 2017, Telecare, 2017, CareChoicesLtd, 2017, TelecareChoice, 2016, TeleCare, 2017, NHS Choices, 2014, Circle Centra, 2017, Living Made Easy, 2017, Disabled Living Foundation, 2013, Mountain et al., 2017, Independent for longer, 2017) and telehealth (NHS Choices, 2014, Nuffield Trust, 2012), rather than for

telemedicine**.**

The review findings also highlighted how the term telehealth is occasionally used interchangeably with telemedicine (Eng, 2001, World Health Organisation, 2009).

* + 1. Telemedicine

Most definitions of 'telemedicine' emphasise that a key feature is the use of information technology to communicate between one site and another from a distance to improve health outcomes (Tan and Lai, 2012, McLaren and Ball, 1995, Spooner and Gotlieb, 2004). The prefix is from the Greek *telos*, which refers to distance (Preston et al., 1992), with the literal translation being 'healing at a distance' *(World Health Organisation, 2009)(pp. 8.).*

*In earlier usages of the term, telemedicine (medicine at a distance) implies communication between doctors and patient in different physical locations where direct face-to-face consultation is not feasible using ancillary means of communication such as telephone and radio. (Tan and Lai, 2012) pp. 2).*

This definition is derived from the work of Preston, (1992) (see below) and McLaren and Ball (1995).

*The Prefix, from the Greek 'telos', implies only distance, but telemedicine has been defined more recently in terms of advanced communications technology. Telecommunication that connects a patient and a health care provider through live two-way audio, two-way video transmission across distances and that permits effective diagnosis, treatment and other health care activities.(Preston et al., 1992)(pp. 1).* This quote was also adapted by *(McLaren and Ball, 1995).*

*Telemedicine is the use of telecommunications for medical diagnosis and patient care. It involves the use of telecommunications technology as a medium for the provision of medical services to sites that are at a distance from the provider. The concept encompasses everything from the use of standard telephone services through high speed, wide band width transmission of digitized signals in conjunction with computers, fibre optics, satellites and other sophisticated peripheral equipment and software. (Scannell et al., 1995)* **(**pp. V).

'The use of interactive audio and video telecommunications permitting real-time communication between the distant site physician or practitioner and the Medicare beneficiary' *(Spooner and Gotlieb, 2004)(pp.659) was reportedly requoted from the* Centers for Medicaid and Medicare Services (2003), but the original source was unavailable.

Another source stated that telemedicine is, 'The use of two-way, interactive telecommunications video systems to examine patients from remote locations, to facilitate medical consultations, and to train healthcare professionals' *(Council on Competitiveness) (pp. 6).*

There appears to be some overlap between definitions of ‘telemonitoring and those for teleconsultation.

* + 1. Teleconsultation

One arm of telemedicine appeared to be teleconsultation, as both terms emphasise 'medicine at a distance' *(Eedy and Wootton, 2001, Richard, 1996, Brick and Schreiber, 1993, The Lancet, 1995, Currell et al., 2000, Scannell et al., 1995)*. Teleconsultation has two forms, one of which is synchronous and the other asynchronous (Kern, 2006, Khoury, 2008, Adnan, 2013, Verhoeven et al., 2010). One definition of teleconsultation comprised:

*A telemonitoring intervention including patient–caregiver asynchronous communication* (monitoring and delivering feedback via email, Internet, cell phone, automated messaging systems, or other equipment without face-to-face contact]*, or synchronous communication, which involves real-time, face-to-face contact (image and voice) via videoconferencing equipment (television, digital camera, webcam, videophone, etc.) to connect caregivers and one or more patients simultaneously, for instance, for the purpose of education. (Verhoeven et al., 2010)* (pp. 668)*”*

Terms linked to teleconsultation include 'telediagnosis', which means diagnosing someone from a distance, using information technology (Medi, 2006). Another is **'**teleconference', which refers to meeting through a telecommunications medium. One definition claims there are at least five types of teleconferencing, including video, which is the medium researched for this project (Healthinformatics., 2017). 'Videoconferencing' is generally defined as, 'A live connection between people in separate locations for the purpose of communication, usually involving audio and often text as well as video' *(TechTarget, 2003)*. This is where video interpreting may be required if participants do not speak the same language, or one has a hearing impairment (Braun, 2007, European Commission, 2013, C. S. L. Studies, 2011).

Videoconferencing can also be delivered through a telepresence device, which is a remotely controlled robot designed to give a sense of actually being in that location and resembles virtual reality. This is often referred to as telepresence (Martinez, 2017).

When the searches were re-run, a new term that came up was 'remote and web 2.0-based

Interventions', which were defined as, 'technologies including personal computers (PCs) and

applications (apps) for mobile technology, such as iPad, Android tablets, smart phones, and

Skype*'* (McCabe et al., 2017) (pp. 1). This definition is in line with previous terms

surrounding telemedicine, e.g. teleconsultation and videoconferencing. Theonly differences

are that this definition emphasises the importance of mobile technology and does not

explore whether both asynchronous and synchronous technology are part of this

definition. In addition, this does not refer to the technology being used for health reasons or

for connecting two people in different geographical sites. Therefore, this term and definition

appear to be a lot broader and less descriptive than the previous terms identified.

Finally, a new term that arose whilst searching for digital technology was

'mobile clinic'. This was found when searching reviews of digital technology. The definition given was, 'clinic vehicle with a healthcare provider (with or without a nurse) and a

driver that visited areas on a regular basis'. As this paper did not mention the use of digital

technology, it was deemed not relevant to the focus of this chapter.

* 1. Conclusion

There are a broad range of definitions and terms for different types of technology used to deliver healthcare. Telemedicine is one aspect of e-health and is based more around synchronous technology connecting patients to remote healthcare professionals.

For the purpose of this project, an adapted definition will be used:

*“In earlier usages of the term, telemedicine (medicine at a distance) implies communication between health care professional and a patient in different physical locations, where direct face-to-face consultation is not feasible using ancillary means of communication such as video, telephone and radio” Adapted; (Tan and Lai, 2012) (pp. 2)* [Adapted].

Instead of a doctor necessarily being at the remote site, the definition has been expanded to include all healthcare professionals and examples of technology, such as video. This was based on the service available in England, the Airedale Telehub, which is staffed by nurses and provides remote support to care homes. The amended definition is now representative of the current services available (Hex and Wright, 2015).

In summary, there are a broad array of terms used in technology to describe different

interventions with overlapping concepts. However, since the review was conducted in 2015,

there appear to have been few changes to how telemedicine is defined and how it relates to other technologies. The terms are visually represented below (Figure 1). As this illustrates, telemedicine still appears to be an area of e-health, and within this lies teleconsultation and videoconferencing, the technology focus of this project.

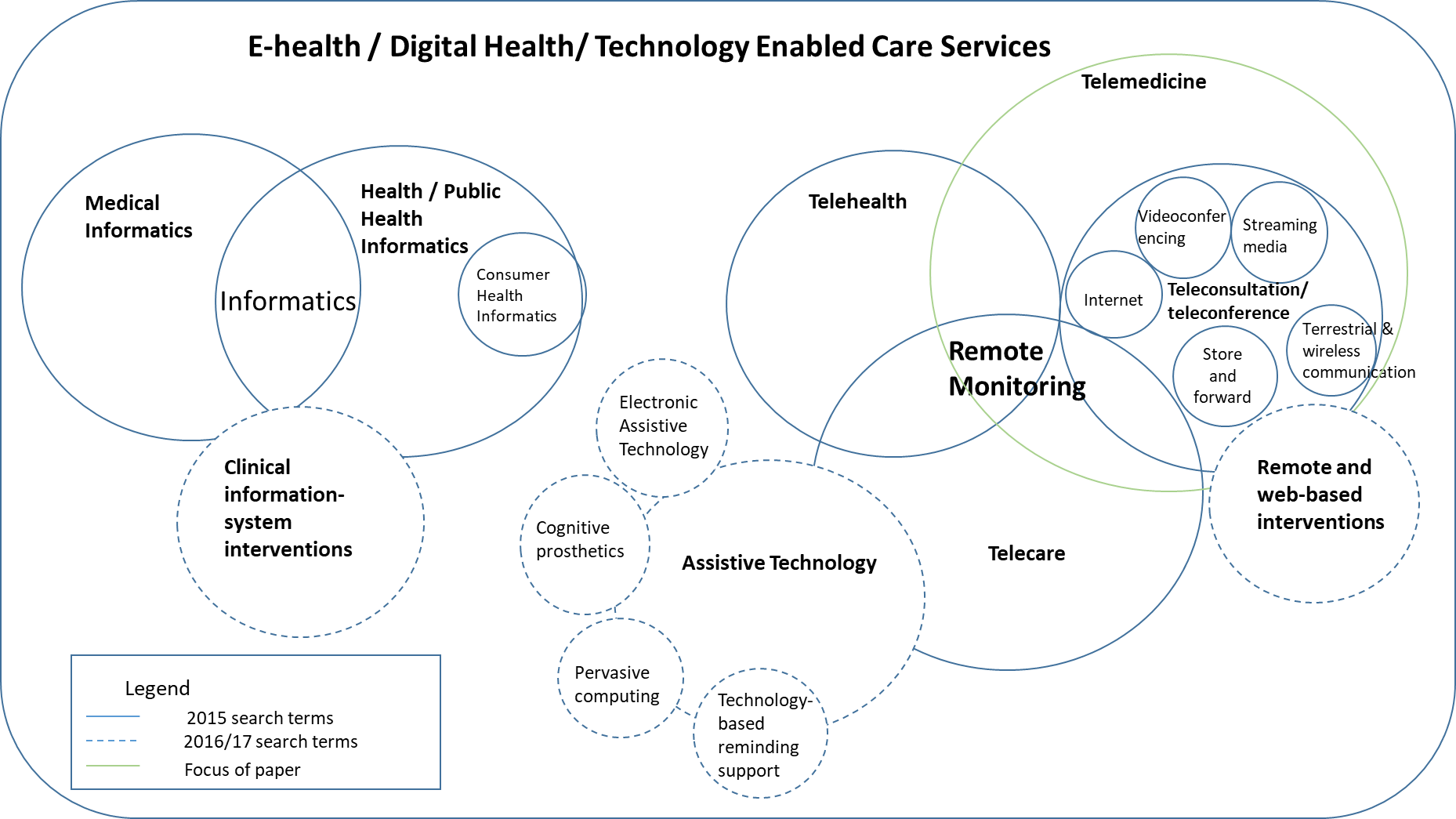


Figure 1 Visual representation of how terms interlink

This last chapter underlined the technological terms used in this project and identify possible keywords for the scoping review. The following chapter describes the review conducted to identify the available research on the use of videoconferencing in healthcare provision for older adults in care homes globally. The review methods, findings and discussion are detailed in Appendix 1.

Chapter 3: Videoconferencing for health care provision for older adults in care homes: a review of the research evidence.

The previous section clarified the technological terms underpinning this project. The following scoping review was conducted to identify the research evidence currently available on videoconferencing. It begins with a description of the background, followed by the method, results, quality assessment, discussion, and limitations, before concluding the work. Material in this chapter has also been published (Newbould et al., 2017), please see Appendix 1. However, this chapter also has an additional section of themes for theory development and adds a quality assessment of included articles.

* 1. Background

Care homes are defined by the English Care Quality Commission (CQC) as homes that 'offer accommodation and personal care for people who may not be able to live independently, with some homes offering 24 hour care from qualified nurses' (Care Quality Commission, 2015). According to Gordon (2014), approximately half of all care home residents need help to mobilise, half are incontinent, and three quarters have dementia (Gordon et al., 2014). The same research showed that health care provision to care homes in the UK is often inadequate for meeting residents' needs (Gordon et al., 2014). Earlier work by the Care Quality Commission (British Geriatric Society, 2016) reported that care home residents often had inadequate access to healthcare services. It has been suggested that technology may be one way of addressing the problem (NHS England, 2015, NHS England, 2016).

A range of digital technologies have already been tested for use in healthcare in care homes, for example: telemonitoring devices (Bratan et al., 2005, Courtney et al., 2008, Liu et al., 2015); telecare devices (Abbate et al., 2014, Potts and Earwicker, 2011, Tseng et al., 2013, Celler et al., 2006, van Gurp et al., 2013, Beale et al., 2010, Law and Padgham, 2011, Pountney, 2009, Ballard, 2010, Dewsbury and Ballard, 2012, Basilakis et al., 2007, Lin et al., 2008); teleconferencing (the use of telephone) (Airedale NHS Trust Foundation, 2014, Wray et al., 2010, Rahman et al., 2010, Codde et al., 2010) , electronic health care records (Yu et al., 2008, Holup et al., 2014); telepresence devices (remotely controlled robots designed to give a sense of someone actually being in that location)(Back et al., 2012, Moyle et al., 2013); digital pen and paper technology (Vowden and Vowden, 2013); and teleconferencing and audit feedback (Colon-Emeric et al., 2007, Colon-Emeric et al., 2013).

This review focused on one type of digital technology (videoconferencing). Videoconferencing has been suggested as a way of addressing problems with access to healthcare (NHS England, 2015, NHS England, 2016) by, for example: improving access to a range of services (Chan et al., 2001) ; encouraging continuity of care (Wakefield et al., 2004);removing the inconvenience of travel (Gray et al., 2012); and improving access for those with physical disabilities (Cruickshank and Paxman, 2013).

The purpose of this review was to identify the extent and nature of the available research on the use of videoconferencing as a method of healthcare delivery for older adults in care homes. This review was conducted prior to selection of realist evaluation as the main methodological approach for the study. Although specific search terms to identify programme theories were not used, these were considered to be key papers. They were therefore looked at retrospectively with a realist lens, to ascertain the use of the literature in developing initial realist theories (Fletcher et al., 2016). As a result, the review aimed to chart the following characteristics: the clinical purposes for which videoconferencing is used in care home settings; the countries from which the research originates; the research designs used; the types of data collected; the main outcomes the research sought to examine; and possible themes for initial theory development. These stages were followed to address the following research question: what is the extent and nature of the available research evidence for videoconferencing as a method of healthcare delivery for older adults in care homes?

* 1. Method

The chosen review method was a scoping review (Arksey and O'Malley, 2005). Scoping reviews allow research to be mapped to identify what literature is available, to address a broad research question, and to establish whether or not a full systematic review would be worthwhile. It focuses on the breadth of research available on a specific topic (Boland et al., 2014). This method was selected to identify the extent and nature of the evidence currently available (Arksey and O'Malley, 2005).

Arksey and O'Malley (2005) identified five key stages to a scoping review: 1) develop the research question; 2) identify studies; 3) select studies; 4) chart the data; and 5) report the synthesised results (Arksey and O'Malley, 2005). However, between stages four and five a quality assessment was also undertaken and reported (Booth et al., 2016).

Search terms were identified for the target population and for videoconferencing by conducting a broad preliminary search to identify relevant keywords and terms (Boland et al., 2014, Fatehi et al., 2016) The terms were informed by the inclusion/exclusion criteria, which are detailed below.

* + 1. Inclusion

Papers that focused on videoconferencing for older adults in care homes, nursing homes, long-term care facilities, and homes for the aged or residential care.

* + 1. Exclusion

Papers that were excluded were those that: focused on technical architecture or cost; were aimed at the treatment of people <65; were not available in English; and/or did not have the full text available. Abstracts were screened to exclude papers where the results were aggregated with those derived from other settings, where the findings for long-term care could not be easily extracted. This included reviews. Where there were duplicate papers of a primary study, only the paper that had the most comprehensive information was included. Opinion pieces were also excluded.

The EMBASE, MEDLINE, Web of Science, and Cochrane Library of Systematic Reviews databases were searched. This was followed by a refined search, using keywords and terms identified through the existing literature. When using the database search fields, keywords used to define the care home population were limited to the main topic of the article, intervention terms were limited to the title, and publication dates from between 2000 and the present day. (This was due to the initial search highlighting a lack of relevant research prior to 2000.) The search terms used were:

*Population*

Care home\* OR nursing home\* OR residential care OR residential facility\* OR long-term care OR old-age\* home OR old age\* home OR residential age\* care OR long-term care

AND

*Intervention*

Video conference\* OR videoconference\* OR video OR videoconsult\* OR video consult\* OR videoteleconferenc\* OR video-teleconferenc\*

AND

E-health OR telehealth OR telecare OR interactive health communication OR teleconference\* OR teleconsultati\* OR telemonitor\* OR telepresence OR telediagnosi\* OR telesurveillance OR technology-enabled care services\* OR digital health OR telemedicine

Reference lists of included papers were searched for further relevant papers. Additional published evidence was identified by contacting experts in the field. Key experts at Airedale Telehub (a provider of videoconferencing for care homes in North Yorkshire, UK) were contacted, along with other sites that were known to have trialled videoconferencing in different contexts.

Of the included papers, 25% were checked by the second author to validate the selection. The level of agreement was high, with only one paper being excluded as a result of validation. Both the student and the first supervisor agreed the paper did not fit the criteria for inclusion upon discussion.

* 1. Results

A total of 2889 articles were identified. Duplicates were removed (n=471), leaving 2418 to be screened by title and abstract (n=2028 removed) (Figure 2). This left 390 to be screened by full text (n=364 removed), with 26 articles identified for inclusion in the review.

Database/source

Search 1

Search 2

Total hits

Web of Science

15

994

979

485

Embase and Medline

495

10

Cochrane Review

281

282

1

CINAHL

108

979

1087

Reference searching

27

0

027

Literature from experts

4

0

4

*Total*

*2755*

*134*

*2889*

Duplicates

471

Assessed for title/abstract

2418

Full text assessed

390

Excluded 2028

Included

26

Excluded 364

Not based in care homes n=127

Full text not available n=125

Did not use videoconferencing for health care provision n= 53

Were aimed at the treatment of people <65 n= 18

Focused on technical architecture or cost = n= 17

Opinion pieces/ reviews n= 10

Not available in English n= 14

Figure 2: Prisma showing paper selection

Data were extracted from the papers based on the following: the clinical purpose of the videoconferencing; the countries from which the research originated; the study design; type of data collected; and outcomes reported and potential for theory development explored.

* + 1. Clinical purpose of use

Table Papers grouped by clinical purpose of use

|  |  |
| --- | --- |
| **Clinical purpose of Use** | **Papers** |
| Assessment | **8** |
| Management | **5** |
| Clinical support | **2** |
| Diagnosis | **1** |
| Various | **8** |
| Not specified | **2** |
| **Total** | **26** |

Table 4 shows the papers grouped by purpose of use. Eight papers reported on the use of videoconferencing solely for health assessment, including: wound assessment (Grabowski and O'Malley, 2014, Laflamme et al., 2005); assessing clinical changes in dementia patients (Lee et al., 2000); general geriatric assessment (Georgeton et al., 2015); assessments by allied healthcare professionals (dietetics, occupational therapy, physiotherapy, podiatry to speech pathology) (Guilfoyle et al., 2003); psychiatric assessments (Grob et al., 2001, Tang et al., 2001); and assessment of acute medical problems (mental status, abnormal laboratory values, or falls) (Weiner et al., 2003).

Five research papers reported the use of videoconferencing for managing a clinical condition through a healthcare professional based at a remote site, such as a hospital (Johnston and Jones, 2001, Yeung et al., 2009, McGibbon et al., 2013, Sävenstedt et al., 2004, Biglan et al., 2009). One example was treatment of mental health problems (Yeung et al., 2009) .

Two papers did not specify the purpose of use: one used secondary data to establish the healthcare specialists/doctors who had been contacted via the system (Gray et al., 2012), and the second examined the relationship between the care home and technology provider, and how this influenced the outcomes of videoconferencing (Mackert and Whitten, 2007).

In two papers that described videoconferencing being used for clinical support (Pope et al., 2013, Hsu et al., 2010), advice was sought by professionals from the remote site, with one paper examining reduction of hospital admissions in residents with COPD (Pope et al., 2013), and the other describing the use of videoconferencing to access a range of healthcare specialists based at one hospital. Specialists included rehabilitation doctors and orthopaedic surgeons (Hsu et al., 2010). One paper assessed the use of videoconferencing for diagnosis, and its effectiveness for identifying undiagnosed dementia in residents (Shores et al., 2004).

Eight papers recounted research that evaluated the use of videoconferencing for more than one purpose (Ratliff and Forch, 2005, Corcoran et al., 2003, Wade et al., 2015, Hex and Wright, 2015, Lyketsos et al., 2001, Hui et al., 2001, Chan et al., 2001, Wakefield et al., 2004). One paper, for example, looked at both assessment and management (Hui et al., 2001) . Other combinations included: assessment and treatment, patient education, management, and falls prevention (Chan et al., 2001); diagnosis and developing a treatment plan (Corcoran et al., 2003, Wakefield et al., 2004) ; assessment and treatment (Ratliff and Forch, 2005); assessment, review, prescriptions and follow-up (Wade et al., 2015); treatment, prescriptions, advice, referrals, and follow-up (Hex and Wright, 2015); update a remote team, review care needs, and develop care plans (Lyketsos et al., 2001); follow-up and urgent review (Hui et al., 2001); and tele-education, telecounselling and telemedicine (Laflamme et al., 2005).

* + 1. Country of origin

Table Papers grouped by country of origin

|  |  |
| --- | --- |
| **Country of origin** | **Papers** |
| America | **12** |
| China | **5** |
| UK | **3** |
| Australia | **3** |
| Korea | **1** |
| Sweden | **1** |
| France | **1** |
| **Total** | **26** |

Table 5 shows the papers grouped by country of origin. Twelve of the identified papers originated from the USA (Grob et al., 2001, Ratliff and Forch, 2005, Lyketsos et al., 2001, Johnston and Jones, 2001, Mackert and Whitten, 2007, Yeung et al., 2009, Grabowski and O'Malley, 2014, Laflamme et al., 2005, Shores et al., 2004, Wakefield et al., 2004, Weiner et al., 2003, Biglan et al., 2009); five were from China (Corcoran et al., 2003, Chan et al., 2001, Tang et al., 2001, Hui et al., 2001, Hsu et al., 2010) three were from the UK (Pope et al., 2013, Hex and Wright, 2015, McGibbon et al., 2013) and three from Australia (Guilfoyle et al., 2003, Gray et al., 2012, Wade et al., 2015). The remaining three papers were from Korea (Lee et al., 2000), Sweden (Sävenstedt et al., 2004) and France (Georgeton et al., 2015).

* + 1. Study designs identified

Table Designs of identified studies

|  |  |
| --- | --- |
| **Main designs** | **Papers** |
| Case studies | **14** |
| Cohort | **5** |
| Repeated measures | **3** |
| Randomised controlled trials | **1** |
| Interviews | **1** |
| Observational | **1** |
| Cross-sectional | **1** |
| **Total** | **26** |

Table 6 shows a breakdown of the papers by study design. The most frequently reported method was case studies, with 14 of the papers describing the use of this design (Ratliff and Forch, 2005, Tang et al., 2001, Mackert and Whitten, 2007, Johnston and Jones, 2001, Lyketsos et al., 2001, Hui et al., 2001, Yeung et al., 2009, Chan et al., 2001, Wade et al., 2015, Gray et al., 2012, McGibbon et al., 2013, Laflamme et al., 2005, Weiner et al., 2003, Biglan et al., 2009). Five cohort studies were identified, and these looked at: general practitioner adherence to assessments undertaken during consultations (Georgeton et al., 2015), videoconferencing for the diagnosis of dementia (Shores et al., 2004), the use of 24- hour consultations (Pope et al., 2013), for the care of dementia patients in Korea (Lee et al., 2000), and the implementation of videoconferencing in long-term care (Hsu et al., 2010). There were three studies that used repeated measures, comparing face-to-face contact with videoconferencing (Corcoran et al., 2003, Guilfoyle et al., 2003, Grob et al., 2001). One compared psychiatric assessments (Grob et al., 2001), another allied health assessments (Guilfoyle et al., 2003) and a third considered podiatric intervention (Corcoran et al., 2003). There was only one randomised controlled trial, and this examined whether videoconferencing could reduce hospitalisations (Grabowski and O'Malley, 2014).

* + 1. Type of data

Table Data reported in papers

|  |  |
| --- | --- |
| **Type of data** | **Papers** |
| Qualitative and quantitative | **12** |
| Quantitative only | **10** |
| Qualitative only | **3** |
| Clinical Outcomes only | **1** |
| **Total** | **26** |

Table 7 shows the types of data collected by the studies included in this review. The most popular, used in 12 studies, was a combination of both qualitative and quantitative data (Guilfoyle et al., 2003, Corcoran et al., 2003, Chan et al., 2001, Wade et al., 2015, Tang et al., 2001, Ratliff and Forch, 2005, Lyketsos et al., 2001, Laflamme et al., 2005, Wakefield et al., 2004, Weiner et al., 2003, Lee et al., 2000, Biglan et al., 2009). Seven of these included a satisfaction questionnaire and qualitative clinical data (Guilfoyle et al., 2003, Corcoran et al., 2003, Chan et al., 2001, Wade et al., 2015, Laflamme et al., 2005, Wakefield et al., 2004, Weiner et al., 2003), such as care records (Wakefield et al., 2004) or care plans being reviewed (Guilfoyle et al., 2003). One paper used clinical outcome scales and observation (Biglan et al., 2009).

Ten of the papers solely used quantitative data (Hex and Wright, 2015, Pope et al., 2013, Georgeton et al., 2015, Gray et al., 2012, Yeung et al., 2009, Grabowski and O'Malley, 2014, Shores et al., 2004, Hsu et al., 2010, McGibbon et al., 2013, Lee et al., 2000). Secondary data included the use of postcode data to compare admission rates between care homes with and without telemedicine (Hex and Wright, 2015) and papers that reported on consultation records and electronic billing (Gray et al., 2012). One collected primary data and secondary data to look for trends in areas such as cost reductions (Ratliff and Forch, 2005). One paper collected routine data and compared non- telemedicine users to telemedicine users to look at admission rates and cost (Grabowski and O'Malley, 2014), and another compared other models of long-term care (Hsu et al., 2010).

Three of the studies were completely qualitative in nature (Mackert and Whitten, 2007, Johnston and Jones, 2001, Sävenstedt et al., 2004). For example, one interviewed nursing staff and explored factors that increased the perception of presence (Sävenstedt et al., 2004).

One used only clinical outcome measures, aiming to establish whether or not psychiatric assessments could be carried out reliably using videoconferencing (Grob et al., 2001).

* + 1. Outcomes

Table Papers grouped by outcome examined. Papers may appear in more than one category if they discuss more than one of the following

|  |  |
| --- | --- |
| **Outcomes** | **Papers** |
| Staff satisfaction | **9** |
| Resident satisfaction | **9** |
| Cost | **8** |
| Resident outcomes | **7** |
| Admissions | **6** |
| Feasibility | **6** |

Table 8 shows the papers which examined a broad range of outcomes relating to videoconferencing. Most of the papers considered staff satisfaction when using videoconferencing, with nine papers referring to this in their findings (Corcoran et al., 2003, Johnston and Jones, 2001, Tang et al., 2001, Wade et al., 2015, Yeung et al., 2009, Hui et al., 2001, Laflamme et al., 2005, Wakefield et al., 2004, Weiner et al., 2003); and resident satisfaction, which was also reported in nine papers (Corcoran et al., 2003, Tang et al., 2001, Wade et al., 2015, Yeung et al., 2009, Hui et al., 2001, Wakefield et al., 2004, Weiner et al., 2003, Johnston and Jones, 2001, Biglan et al., 2009). Eight examined the effect on cost (Grabowski and O'Malley, 2014, Hex and Wright, 2015, Hui et al., 2001, Lyketsos et al., 2001, Pope et al., 2013, Ratliff and Forch, 2005, Tang et al., 2001, Biglan et al., 2009). Four of these considered how a reduction in admissions reduced cost (Grabowski and O'Malley, 2014, Pope et al., 2013, Hex and Wright, 2015, Lyketsos et al., 2001). One addressed how a reduction in admissions and in transportation costs to A&E had reduced cost (Hui et al., 2001), two reported on how reducing visits to outpatient clinics affected cost (Tang et al., 2001, Ratliff and Forch, 2005), and one paper considered how improving the management of Parkinson's through videoconferencing reduced the cost of medication to manage the symptoms and transportation costs to outpatient clinics (Biglan et al., 2009). A further seven papers addressed resident outcomes (Hex and Wright, 2015, Lyketsos et al., 2001, Hsu et al., 2010, Wakefield et al., 2004, Weiner et al., 2003, Lee et al., 2000, Biglan et al., 2009), six examined changes in admission rates (Grabowski and O'Malley, 2014, Hex and Wright, 2015, Lyketsos et al., 2001, Pope et al., 2013, Wade et al., 2015, Hsu et al., 2010) and feasibility of use (Chan et al., 2001, Guilfoyle et al., 2003, Hui et al., 2001, Tang et al., 2001, Yeung et al., 2009, Laflamme et al., 2005). Outcomes present in three papers or fewer were excluded from this table.

* + 1. Themes for theory development

Table 9 (pp.51) highlights possible candidate theories that may affect the use of videoconferencing within different contexts, as defined by the Consolidated Framework of Implementation Research (CFIR) (Appendix 8).

Table Breakdown of possible candidate theories identified

|  |  |  |  |
| --- | --- | --- | --- |
| CFIR Construct | | Description of key findings | References |
| Intervention Characteristics | Relative Advantage (Compared to other services) | Perceived relative advantage was identified as linked to: cost reduction in comparison to other services, a reduction in the distance and time taken to travel to other services, perceived effect on resident outcomes and if these had improved, the care homes current access to services/specialists and if videoconferencing improved access and improved continuity of care | (Laflamme et al., 2005, Shores et al., 2004, Wakefield et al., 2004, McGibbon et al., 2013, Guilfoyle et al., 2003, Tang et al., 2001, Corcoran et al., 2003, Lee et al., 2000, Weiner et al., 2001, Hex and Wright, 2015, Ratliff and Forch, 2005, Pope et al., 2013, Grabowski and O'Malley, 2014, Wade et al., 2015, Yeung et al., 2009, Grob et al., 2001, Johnston and Jones, 2001, Georgeton et al., 2015, Lyketsos et al., 2001, Hsu et al., 2010, Hui et al., 2001, Chan et al., 2001) |
| Technological characteristics | Reliability and quality of technology was linked to the quality of the sound and picture available, as well as signal strength | (Laflamme et al., 2005, Weiner et al., 2001, Shores et al., 2004, Wakefield et al., 2004, Grob et al., 2001, Johnston and Jones, 2001, Tang et al., 2001, Corcoran et al., 2003, Wade et al., 2015, Lee et al., 2000, Hui et al., 2001, Sävenstedt et al., 2004, Biglan et al., 2009, Chan et al., 2001) |
| Packaging Quality and Design | Portability/accessibility of the technology and the security and confidentiality of the resident were highlighted as factors that affected the perceived benefits to using the system | (Laflamme et al., 2005, Weiner et al., 2001), (Shores et al., 2004, Sävenstedt et al., 2004) |
| Trial-ability | Having the opportunity for care homes to trial the system might have an impact on satisfaction ratings when using videoconferencing | (Wakefield et al., 2004) |
| Outer Setting | Cosmopolitanism | Relationship with the remote provider was seen to affect use, a more equal and trusting relationship affected how staff felt about using the system | (Georgeton et al., 2015, Wakefield et al., 2004, Johnston and Jones, 2001, Mackert and Whitten, 2007, Wade et al., 2015, Sävenstedt et al., 2004, Biglan et al., 2009) |
| Patient needs and resources | High staff turnover meant the need for more training and proved a challenge to implementation | (Wade et al., 2015). |
| Inner Setting | Structural Characteristics | Staff turnover at the care home negatively affected resident communication over videoconferencing, and the level of medical training amongst staff affected what the system was used for | (Georgeton et al., 2015, Corcoran et al., 2003, Mackert and Whitten, 2007, Hui et al., 2001, Sävenstedt et al., 2004), (Lee et al., 2000) |
| Implementation Climate | Reasons the home used videoconferencing and what health conditions use was linked to frequency of use | (Hex and Wright, 2015, McGibbon et al., 2013, Grob et al., 2001, Yeung et al., 2009). |
| Culture | Resident/staff relationships important in improving communication over videoconferencing | (Sävenstedt et al., 2004),(Grabowski and O'Malley, 2014) |
| Individual Characteristics | self-efficacy | Low self-efficacy in using technology and managing resident care was reported to negatively affect use | (Wakefield et al., 2004, Guilfoyle et al., 2003, Lee et al., 2000), (Lyketsos et al., 2001, Yeung et al., 2009, Chan et al., 2001) |
| Compatibility | Language barriers proved to be a challenge if resident and remote staff could not communicate with each other | (Yeung et al., 2009) |
| The health of resident was seen as a barrier, where it was perceived the residents' ability to communicate may affect use | (Wakefield et al., 2004, Tang et al., 2001, Wade et al., 2015, Lee et al., 2000, Hsu et al., 2010, Hui et al., 2001, Sävenstedt et al., 2004) |
| Process | Engaging (staff at the care home) | Factors included: staff training, developing clear protocols for use, available troubleshooting/technical support | (Wakefield et al., 2004, Johnston and Jones, 2001, Wade et al., 2015), (Lyketsos et al., 2001), (Johnston and Jones, 2001) |
| Champions | The use of champions to promote the intervention | (Wade et al., 2015). |
| Planning | One paper also identified pre-grant work, vendor selection, pre-installation planning, installation as factors affecting implementation | (Mackert and Whitten, 2007) |

The papers focussed mainly on the characteristics of videoconferencing and its perceived relative advantage over other services that are delivered face-to-face. For example, could measures for cognitive impairment be assessed reliably using the technology versus face-to-face delivery of the measure,thus reducing the need for the health care professional or resident to travel (Shores et al., 2004)? Other intervention characteristics related to the reliability of the technology and its quality. For example, the ability to perceive body language (Lee et al., 2000), as well as the portability/accessibility of the technology and its trialability, which could improve familiarity and improve ease of use. These were raised as general challenges when trialling the system (Wakefield et al., 2004).

Factors identified from the outer setting included cosmopolitanism and staffing levels at the remote site. Where staff had an equal and trusting relationship, this affected the outcomes being studied, for example in terms of adherence to medications (Georgeton et al., 2015). Where staffing levels at the remote site were inconsistent and there was a high staff turnover, this made it difficult to maintain training (Wade et al., 2015).

Factors related to the inner setting of the care home were: resources and staffing, including staff turnover (Sävenstedt et al., 2004), and the reasons for use, such as whether it was used more frequently for different specialists (Gray et al., 2012). This was not relevant in the context of England, as known providers in this area only provided access to nursing staff (5.9).

The security and confidentiality of the resident were also highlighted as affecting the perceived presence of the remote healthcare professional (Sävenstedt et al. 2004). Additionally, cultural factors included resident/staff relationships. Where staff and residents had close relationships, communication with the hub improved. For example, care assistants could better interpret what the residents were trying to communicate (Sävenstedt et al., 2004). Additionally, Weiner (2003) concluded that videoconferencing may be of most use in nursing homes for less common and more acute conditions, such as changes in mental status and falls (Weiner et al., 2003).

Individual characteristics, such as low self-efficacy in using technology (Guilfoyle et al., 2003) and managing resident care, negatively affected outcomes, as staff were unsure of when to access the service (Lyketsos et al., 2001). The health of the resident was also a factor, for example whether they were hearing- or sight-impaired affected how easily they could communicate using videoconferencing (Wakefield et al., 2004). Additionally, where the resident and member of staff at the remote site were not proficient in the same language, this was identified as a barrier to communicating over the system (Lee et al., 2000).

Aspects of the process that could affect use included staff training (Wakefield et al., 2004); developing clear protocols for use (Lyketsos et al., 2001); available troubleshooting/technical support; and the use of champions to increase uptake within the trial (Wade et al., 2015). One paper also identified pre-grant work, vendor selection, pre-installation planning, and installation as factors affecting implementation (Mackert and Whitten, 2007) .

* 1. Quality assessment

As the randomised control trial is considered to be the highest level of evidence amongst the papers presented (Grabowski and O'Malley, 2014), this was assessed alongside the CASP tool (Critical Appraisal Skills Programme, 2017). The paper seemed to be of low quality, without a clear description of the research population or how the participants had been randomised. Additionally, the outcome measures used to assess the effectiveness of use and engagement were unclear.

The remaining papers were assessed using the Rapidly Reviewing the Evidence (RaRE) approach. This allows for a summary of the quality of the evidence within time and resource constraints. For this approach the literature was assessed by methodological limitations reported by authors, shared weaknesses of study design and by quality of the reporting (Booth et al., 2016) (Please see Appendix 2 for more information).

* + 1. Methodological limitations of the studies as reported by authors

The limitations noted by the authors of papers include that they were small pilot studies (Guilfoyle et al., 2003, Laflamme et al., 2005), or that the findings were just preliminary and that more work needed to be undertaken (Hsu et al., 2010). Some papers attributed their poor data collection to the duration of the project (Laflamme et al., 2005, Wade et al., 2015), limited funding (Gray et al., 2012, Guilfoyle et al., 2003), resources constraints (Corcoran et al., 2003), or small sample sizes (Laflamme et al., 2005, Ratliff and Forch, 2005, Georgeton et al., 2015, Guilfoyle et al., 2003, Wakefield et al., 2004).

Others noted problems with the assessment tools used, either in assessing eligibility (Grob et al., 2001), due to a time lapse between assessments (Corcoran et al., 2003), or data collection (Lee et al., 2000). One paper reported a lack of blinding of the intervention the resident had received (Corcoran et al., 2003), whilst the randomised control trial stated that no possible confounding variables had been controlled for (Grabowski and O'Malley, 2014).

The availability of information was also raised as an issue, with five papers naming incomplete or unavailable data as a problem (Weiner et al., 2001, Gray et al., 2012, Hex and Wright, 2015, Georgeton et al., 2015, Shores et al., 2004, Grabowski and O'Malley, 2014).

Four papers highlighted problems with samples not being randomised (Laflamme et al., 2005, Hex and Wright, 2015, Wakefield et al., 2004, Hsu et al., 2010), or not being representative of the larger population (Laflamme et al., 2005, Ratliff and Forch, 2005). Three papers, reported the exclusion of participants due to dementia or severe impairment (Grob et al., 2001, Wakefield et al., 2004, Grabowski and O'Malley, 2014), and one project noted that findings had been based purely on the experiences of participants, which could be biased (Sävenstedt et al., 2004), whilst another suggested that allied health professionals delivering assessments over videoconferencing could be biased (Guilfoyle et al., 2003).

Five papers also clearly stated that their results were not generalizable to the larger population (Shores et al., 2004, Wakefield et al., 2004, Grabowski and O'Malley, 2014, Hsu et al., 2010, Sävenstedt et al., 2004).

* + 1. Shared weaknesses of study design

The disadvantages of case studies include it not being possible to generalise them to the wider population, or replicate them, and also there being the possibility of introducing researcher bias, with recording accuracy compromised when relying on researchers to recall cases (Zainal, 2007).

The disadvantages of observational studies, such as cohort studies and cross-sectional studies, include the efficiency of prospective cohort studies only increasing as the outcome of interest increases. This problem can be compounded by the loss of participants at follow-up, with retrospective data potentially not entirely meeting the needs of the study. The data used were not collected for the purpose of the study, and there can be problems with recall bias. In addition, controlling for confounding variables between the two cohorts being assessed can be problematic. These can only be controlled for through a randomised control trial. As participants are not randomised, due to being naturally occurring groups of people in the population, the possibility of bias is created, and samples may not be representative of the population (Mann, 2003).

For cross-sectional studies, disadvantages include it being hard to establish the link between variables, and establish whether or not two variables are simply associated or causally related. As a result, rarer health conditions cannot be studied using this method as the sample size is not large enough (Mann, 2003).

For repeated measures, the biggest drawback is exposing participants to multiple treatments/interventions, and how the order in which they are exposed can influence the outcome. Participant fatigue may also affect results (Minke, 1997).

Finally, the disadvantages of interviews include the fact that they are prone to bias when the respondent wants to prove that an intervention is working. The interviewer must be appropriately trained to elicit in-depth information from the participant. In-depth interviews cannot be generalised, as samples are often small and participants not randomly selected (Boyce and Neale, 2006).

* + 1. Quality of reporting

When assessing the quality of reporting, it is noted that that the two conference abstracts were limited by how much they reported (McGibbon et al., 2013, Pope et al., 2013). Ten papers were also limited in how much they reported and how clear they were on the methodology and challenges faced. None of the ten clearly reported the study limitations (Tang et al., 2001, Mackert and Whitten, 2007, Johnston and Jones, 2001, Lyketsos et al., 2001, Hui et al., 2001, Yeung et al., 2009, Chan et al., 2001, Pope et al., 2013, McGibbon et al., 2013, Biglan et al., 2009). The remaining papers were clearly presented, including all key information, clearly describing the population studied, the aims, and the challenges faced (Laflamme et al., 2005, Ratliff and Forch, 2005, Weiner et al., 2003, Wade et al., 2015, Hex and Wright, 2015, Gray et al., 2012, Georgeton et al., 2015, Shores et al., 2004, Corcoran et al., 2003, Guilfoyle et al., 2003, Grob et al., 2001, Wakefield et al., 2004, Grabowski and O'Malley, 2014, Hsu et al., 2010, Lee et al., 2000, Sävenstedt et al., 2004).

* 1. Discussion

The purpose of this review was to identify the extent and nature of the research on the use of videoconferencing as a method of healthcare delivery for older adults in care homes.

The review identified videoconferencing as being most frequently used for clinical assessment, either on its own (Grabowski and O'Malley, 2014, Georgeton et al., 2015, Guilfoyle et al., 2003, Grob et al., 2001, Tang et al., 2001, Laflamme et al., 2005, Weiner et al., 2003, Lee et al., 2000), or in combination with other applications (Ratliff and Forch, 2005, Corcoran et al., 2003, Wade et al., 2015, Hex and Wright, 2015, Lyketsos et al., 2001, Hui et al., 2001, Chan et al., 2001, Wakefield et al., 2004) . There are a wide range of other applications that need to be explored further in future research. For example, this paper highlights a lack of research on the use of videoconferencing for clinical support (Pope et al., 2013, Hsu et al., 2010) and diagnosis (Shores et al., 2004). Research addressing how the needs of older adults living in care homes affects the range of purposes videoconferencing is used for, would also be beneficial in determining how best to apply videoconferencing to meet resident’s needs.

The majority of the research papers originated in the USA (Grob et al., 2001, Ratliff and Forch, 2005, Lyketsos et al., 2001, Johnston and Jones, 2001, Mackert and Whitten, 2007, Yeung et al., 2009, Grabowski and O'Malley, 2014, Laflamme et al., 2005, Shores et al., 2004, Wakefield et al., 2004, Weiner et al., 2003, Biglan et al., 2009), China (Corcoran et al., 2003, Chan et al., 2001, Tang et al., 2001, Hui et al., 2001, Hsu et al., 2010), and three were from Australia (Guilfoyle et al., 2003, Gray et al., 2012, Wade et al., 2015). These countries may be more invested in researching videoconferencing due to the fact that they have large, sparsely populated areas, where remoteness and increased travel time make conventional services difficult to provide. This may mean that services are more difficult to access and community services may be more challenging to provide, due to the time and cost associated with travelling to remote services and/or care homes (McGibbon et al., 2013).

More global research would provide a better understanding of how videoconferencing could work in different contexts, as the research identified in this review may have limited generalisability to other country contexts (Bonell et al., 2006).

This review found very little population-based evidence available about the use of videoconferencing, with 20 of the papers describing small scale studies of just one care home (Yeung et al., 2009, Guilfoyle et al., 2003, Grob et al., 2001, Gray et al., 2012, Ratliff and Forch, 2005, Hui et al., 2001, Johnston and Jones, 2001, Tang et al., 2001, Corcoran et al., 2003, Mackert and Whitten, 2007, Lyketsos et al., 2001, Chan et al., 2001, Hsu et al., 2010, McGibbon et al., 2013, Laflamme et al., 2005, Shores et al., 2004, Wakefield et al., 2004, Weiner et al., 2003, Sävenstedt et al., 2004, Biglan et al., 2009). There were only two large studies (Pope et al., 2013, Hex and Wright, 2015), one of which included 14 care homes (Pope et al., 2013), and another with 50 care homes (23 homes without telemedicine, compared to 27 with telemedicine) (Hex and Wright, 2015). In the other studies, recruitment ranged from two to 11 care homes (Georgeton et al., 2015, Wade et al., 2015, Grabowski and O'Malley, 2014, Lee et al., 2000). This suggests that research into videoconferencing for remote health care provision in care homes is still in its infancy, globally. Additionally, a lack of large controlled studies makes the findings hard to generalise (Kukull and Ganguli, 2012).

The most frequent type of data identified in this review was a combination of quantitative and qualitative data (mixed methods) (Guilfoyle et al., 2003, Corcoran et al., 2003, Chan et al., 2001, Wade et al., 2015, Tang et al., 2001, Ratliff and Forch, 2005, Lyketsos et al., 2001, Laflamme et al., 2005, Wakefield et al., 2004, Weiner et al., 2003, Lee et al., 2000, Biglan et al., 2009), suggesting that many studies examined a range of clinical outcomes, as well as exploring stakeholder experiences of using videoconferencing. Although mixed methods research can address a broader range of research questions, it may be unable to capitalise on the strengths of both methods, unless carried out by a large research team. Thus, more purely qualitative or quantitative research may be beneficial for obtaining a more in-depth or broader understanding than may be possible when trying to balance the two approaches (Johnson and Onwuegbuzie, 2004). There were only three papers that were completely qualitative in nature (Mackert and Whitten, 2007, Johnston and Jones, 2001, Sävenstedt et al., 2004), thus more robust qualitative studies are required to determine how experiences of videoconferencing may vary geographically and by purpose of use.

The most frequently reported outcome was level of staff and resident satisfaction, with fewer looking at the feasibility of videoconferencing. This suggests that one of the main motivating factors for videoconferencing implementation is to improve staff and resident satisfaction. More robust studies in this area, in addition to further exploring how satisfaction and the feasibility of videoconferencing may vary by context, would be beneficial.

Although the papers suggested possible areas for theory development through the identification of possible mechanisms and contextual factors that may influence use, the focus was on intervention characteristics, with fewer identifying contextual and individual factors. Additionally, none of the research identified factors that could affect uptake and sustainability. The paper that identified the greatest number of factors relating to implementation was focussed on identifying factors outside the home, particularly the relationship between the videoconferencing provider and care home provider. This paper was not deemed suitable for initial theory development, as this research aims to identify factors linked primarily to the inner context.

The findings from this review highlight a need for more research exploring the clinical purposes for videoconferencing in care homes, such as for rehabilitation (Peel et al., 2011). More research needs to be conducted globally to obtain a better understanding of how videoconferencing might work within different clinical and geographical contexts and with different populations of care home residents. Larger controlled trials would help to identify the broad range of outcomes videoconferencing may have on residents' health. Additionally, more theory-driven research is required to identify the mechanisms of change needed for successful implementation of videoconferencing in care homes. A research design that placed greater emphasis on rigorously conducted qualitative research would be useful for a more in-depth understanding of the user experience, particularly related to resident outcomes, and for looking specifically at the reliability and feasibility of videoconferencing in care homes.

* 1. Limitations of the review

This was a PhD study and therefore resources for cross validation of measures was not available. This may mean there are inconsistencies in papers included in the findings.

* 1. Conclusions

It is evident from undertaking the scoping review that a systematic review would not be fruitful due to the lack of rigorous studies (Arksey and O'Malley, 2005).

The findings show that there are a wide range of applications for videoconferencing technology in care homes, with the most common being for assessment of resident health. Additionally, most of the research was identified as originating from countries that have large, sparsely populated areas.

In order to understand the contexts and mechanisms that lead to successful implementation of videoconferencing in care homes, more vigorous studies need to be undertaken to start to understand outcome patterns that will lead to success or failure of videoconferencing within care homes in different contexts globally.

As the papers in this review were insufficient in aiding initial theory development. This led the researcher to start data collection for the in-depth case studies with a more inductive approach (Please see section 6.5)

The following chapter described the development and findings of a survey that was developed to explore the current provision, attitudes and knowledge of videoconferencing in care homes in Yorkshire and the Humber. Findings were used to identify homes for participation in the in-depth evaluation (Please see chapter 5.12).

Chapter 4: Study 1: Survey

The last chapter identified the primary research available on videoconferencing in healthcare provision in care homes globally. This chapter describes the development and findings of a survey developed to explore the current provision of, attitudes to, and knowledge of videoconferencing in care homes in Yorkshire and the Humber.

The literature review (Chapter 3) identified a lack of research on the use of videoconferencing for remote healthcare for older adults in the UK, and improved the researcher's understanding of the extent of the relevant research. Other than the information available about innovation that can be obtained from the internet, details of the state of current provision in the UK, who is using videoconferencing, and what they are using it for, remain unclear (Edirippulige et al., 2013).

Current provision of videoconferencing in Yorkshire and the Humber was mapped using a survey initially designed to give a snapshot of care home managers' views of technology and videoconferencing. Descriptive surveys, such as this, do not provide robust evidence for cause and effect relationships (Bowling, 2014), but enable interpretation of the views of the target population (Kelley et al., 2003). The findings were also used to identify homes for in-depth case studies, described in Chapter 6.

4.1 Survey Aims

* To explore the use of videoconferencing to access healthcare in care homes, with a focus on factors that affect the provision and effectiveness of videoconferencing.
* To identify potential research sites for further study in the second year.
  + 1. Survey Objectives

1. To identify how residents currently access healthcare
2. To explore the awareness, knowledge, and views of care home managers of videoconferencing as a method of healthcare delivery
3. To establish if and how care homes use videoconferencing to access healthcare
4. To ascertain the current human, technical and geographic factors that may affect the uptake, perception and use of videoconferencing
   1. Method

The literature on survey design states that, where possible, validated data collection tools that have been used by others should be used before designing new outcome measures/questions (Bowling, 2014). The literature identified through the scoping review (Chapter 3) was checked for research that had already used survey tools. Two of the papers identified had published the surveys they used to obtain the perceptions and usefulness of videoconferencing (Tang et al., 2001, Chan et al., 2001). However, no surveys were identified as being of use for the research questions this study aims to address. This is because only the results were published, with no reference to the name or validity of the measure (Tang et al., 2001, Chan et al., 2001).

In order to improve the content validity of surveys, a bottom-up approach is suggested, as this will ensure the terminology and language is appropriate to the studied population. It may also improve responsiveness (Stevens and Palfreyman, 2012). Bowling (2014) notes the importance of consulting with expert stakeholders before developing and piloting a survey to improve validity(Bowling, 2014, Stone, 1993).

To develop the survey, it is suggested that survey questions should be created using data generated by asking individuals from the target population about their experiences, perceptions, and views (Stevens and Palfreyman, 2012). For this survey, the target population was care home managers across the region, and the intended survey was cross-sectional to obtain a broad perspective on managers' views at a single time point, rather than their views over time. The initial survey aims and objectives were as follows.

* 1. Initial Survey Aims
* To obtain data on the extent of awareness, usage, and perceptions of the value of digital technologies in accessing healthcare in care homes, with a focus on factors that affect the provision and effectiveness of videoconferencing
* To identify potential research sites for further in-depth case studies
  + 1. Initial survey objectives

1. To identify care homes that are using technology for access to health care and those that are not across the Yorkshire and Humber region
2. To explore the awareness, knowledge and views of care home managers on videoconferencing as a method of health care delivery
3. To establish how care homes are using videoconferencing to access health care
4. To ascertain the current human (e.g. staff skill mix, confidence, training), technical (ease of use) and geographic factors (availability of other health services in the area/ distance from them) that may affect the uptake, perception and use of videoconferencing

These were then amended after the pilot (please see 4.1.1).

* 1. Survey development

Homes provided by Sheffcare and Anchor were approached, as well as those who had received the videoconferencing service provided by Airedale and that were part of the Enabling Research in Care Homes (ENRICH) Network. The ENRICH Network is a network that has been set up by the NIHR to help improve the recruitment of care home managers in research and to raise awareness or conduct care home research (ENRICH, 2015).

Stevens and Palfreyman (2012) identified five key steps to developing a survey. These were followed in the creation of this research survey, and are described below.

1. *Identify interviewees:* Here, purposive sampling was used to recruit care home managers. Four managers who met the criteria specified for the sampling frame were approached. These criteria specified managers from either nursing or residential care homes (with residents over the age of 65), whereby videoconferencing was or was not used as a method of accessing healthcare. Two care home managers used videoconferencing and two did not; two managed residential homes, and two managed nursing homes.

Participants were recruited through a senior member of care home staff, who circulated an email to care home managers, which included: a covering letter, a participant information sheet, and a copy of the consent form. The covering letter advised them to contact the researcher if they were willing to participate.

1. *Decide on method of data collection:* Individual interviews were deemed to be the most suitable to allow the individuals to express their views and experiences without being influenced by others (Fylan, 2005).
2. *Design/conduct data collection:* Semi-structured interviews were used to allow the individual freedom to expand on questions, whilst keeping the interview focussed on the main phenomenon of interest and allowing for cross-case compatibility (Bryman, 2012).

The interview guide was developed with the goal of identifying content for the survey (Bowling, 2014) and was based on what had been found from the previous scoping review (Chapter 3) and established from the special interest group (see 8.6). The interview guide was then piloted with work colleagues. The feedback was used to further refine and develop the guide, making it more comprehensive and appropriate for the target audience (Silvia, 2011).

Participants were approached by e-mail initially, with the participant information sheet and consent form attached. They were given the opportunity to ask questions before signing (face-to-face) or verbally agreeing (telephone) to all the points on the consent form. This included consent for the interviews to be recorded and transcribed verbatim. Interviews took 10-15 minutes each, were recorded on an encrypted recorder, and then transcribed verbatim. Upon agreeing to take part, participants were interviewed either by telephone or in a place and time convenient to them, depending on their preference. Two interviews were conducted at the participant's place of work, and two were conducted over the phone.

During the interviews, guidance was also followed regarding the delivery of questions, ensuring the avoidance of leading questions and instead the use of introductory, follow, probing, specifying, and structuring questions (Bryman, 2012).

1. *Analysis:* Thematic analysis of the interviews was undertaken, clustering the responses into themes in a way that could be best represented in the planned survey (Hall, 1996).

The themes were ideas that reoccurred in the data. Table 10 gives a summary of the themes identified in the analysis (Bryman, 2012).

1. *Develop descriptive survey/tool:* The themes were used to help inform the development of the survey, and best evidence was used (Dalya et al., 2007), when considering the hierarchy of research evidence in terms of rigour (Turner, 2018). In the absence of systematic reviews, evidence should be considered that is the most reliable and most appropriate for answering the research questions (Turner, 2018). Therefore, the semi-structured interviews were primarily used to inform the survey development, followed by the SIG and then the scoping review (Turner, 2018). Where concerns had been raised regarding the benefits of technology or videoconferencing, these were used to inform response categories (for example, reasons for why homes may not want to implement videoconferencing), as well as to identify other possible factors that may influence uptake and effectiveness. The findings from the interviews were considered alongside the outputs (a report suggesting possible negative and positives of the use of technology in care homes can be found at Appendix 3), from the SIG (special interest group) and scoping review. This ensured that the most pertinent factors were represented in the survey, with the categories being exhaustive (Stone, 1993). Additionally, other categories were added where there was the potential for response categories to be missed, and free text boxes were added to allow participants to discuss factors that had not been addressed in the survey (Stone, 1993). Questions were then sequenced to go from more general to more specific, with introductions for each new section outlining the study and questions to be asked (Stone, 1993).

Table Shows a summary of the themes identified though the interviews and how these, along with data from the scoping review and SIG were used to develop the survey

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Themes developed from interviews** | | | **Survey informed by** | | | **Collated data** |
| Super theme | Main theme | Subtheme | Interview | Review | SIG | How reflected in survey |
| A. Basic Information | About the home | Funding, type of home, staff | Yes |  |  | Homes were asked about how they were funded and about initiatives to reduce hospital admissions. (See 'Access to Services'). They were asked to identify as a nursing home, residential, or both, and to report on the number of staff employed in each position at the home |
|  | About the residents | Age range of residents, no. of residents, resident needs, ethnic background | Yes | Yes |  | Respondents asked to report on age range, ethnicity of residents and number of residents currently living at the home. Residents needs were covered in morbidities |
| B. About residents healthcare needs | Morbidities | Cardiovascular, diabetes, elderly frail, elderly mentally impaired, palliative, physically disabled or immobile | Yes | Yes |  | Respondent were asked to report how many respondents had the following healthcare needs. This was followed up in section by asking in what conditions videoconferencing in used to help manage these conditions |
|  | Access to services | In hours (999, clinic, district nurses, ECP, GP, nursing staff, visiting hospital, outpatient appointments) | Yes | Yes |  | Respondents were asked how often they used the following services |
|  |  | Out-of-hours (999, ECP, GP, through ICT) | Yes | Yes |  | Respondents were asked how often they used the following services |
|  |  | Initiatives to reduce admissions | Yes | Yes |  | Respondents asked if they were implementing any initiative to reduce hospital admissions and what they were |
| C. The use of | Access to/ | Wi-Fi/broadband/telephone line | Yes | Yes |  | Asked to report on whether or not they had access to: Wi-Fi/broadband/telephone line |
| technology to access healthcare | knowledge of technology/ situations used | Videoconferencing, telephone call, sending images or video, sending physiological data, telecare, health informatics | Yes | Yes |  | Respondents asked to report on whether or not: they thought these technologies would be useful, they would be able to acquire it, they were aware of them, and they used them. They were then asked for a description of use. This section was informed by the interviews and scoping review |
| D. The use of | Do not use VC | Perceptions | Yes | Yes |  | Respondents asked to select a statement on their view of videoconferencing |
| Videoconferencing |  | Reasons not to install VC (residents not comfortable being seen in this way, staff training, quality of care, technical equipment) | Yes | Yes | Yes | Respondents were asked to rank statements on reasons why they would not implement videoconferencing. (These were incorporated) |
|  |  | Reason to install it (cost, quality of care, reduce admissions, staff workload, staff confidence, staff view) | Yes | Yes | Yes | Respondents were asked to rank statements on reasons why they would implement videoconferencing. (These were incorporated) |
|  | Use VC | Details of service | Yes | Yes |  | Respondents were asked which service they used (hard/software included) and how long they had used it for |
|  |  | Reason to install it (increase access to services) | Yes | Yes | Yes | Respondents were asked to rank the reasons for installing the system. (These were incorporated alongside reasons previously given in the corresponding section above) |
|  |  | Reasons not to install it (confidence in system, staff view, technical equipment) | Yes | Yes | Yes | These categories were included in the questions where respondents were asked to rate different aspects of videoconferencing |
|  |  | Perceptions | Yes | Yes |  | Respondents were asked to rate different aspects of the system, as well as their opinion on the effects of videoconferencing |
| E. Practicalities |  |  | Yes | Yes |  | Advice was considered alongside survey development |

* 1. Pilot Survey

The online survey was piloted with two managers ( 1 care home manager of a nursing home with videoconferencing and 1 care home manager in a residential home without videoconferencing) (<https://www.surveymonkey.co.uk/r/telemedicine_carehomes>) . The other two care home (1 care home manager of a nursing home without videoconferencing and 1 care home manager in a residential home with videoconferencing) were asked to pilot and provide feedback on a hard copy of the survey (Bowling, 2014, Stone, 1993). The feedback from the respondents was that the questionnaire was too long. Consequently, the content was amended to focus on videoconferencing. The aims and objectives were amended (Chapter 4.1.1) to focus on telemedicine. The first part of the survey was changed to ask how residents accessed healthcare generally and about their specific use of telemedicine. Prior to this, there was a section on how residents accessed healthcare generally with a broader range of questions on the use of different types of technology. Removing the questions about alternative types of technology made the survey focussed and concise, which helped to reduce its length.

The changes to the objectives were reflected in the final survey, as questions about the use of different types of technology to access healthcare were removed.

Following the refinement of the survey, 6 university based research staff were asked to pilot the survey. Half were asked to pilot the paper version and half the online version. Please see figure 3 for more information on the development and distribution of the survey:

Figure 3: Process of survey development and distribution

* 1. Survey design and cover letter

The content of the survey was developed through the stages described in pages 58-64.

Guidance was followed from a range of literature on survey layout and ways of wording, forming, and designing surveys to ensure the best possible response rate and validity. This included using terminology and wording the respondents would understand, and being unambiguous and clear (Hall, 1996, Stone, 1993). For example, all of the questions were clear and ordered sequentially (Bowling, 2014). The hard copy survey was printed by a professional printing service to improve its appearance and clarity and ensure it appeared professional (Hall, 1996).

Basic guidance on how to compose a cover letter to accompany the survey was followed. This included a description of why the study was important and how confidentiality would be protected (Dillman, 1991). The letter ensured the respondents knew how their contact details had been obtained, and included the university and the Collaboration for Leadership in Applied Health Research and Care(CLAHRC) logo in the letterhead. CLAHRCs are funded programmes of research intended to ‘increase capacity and implement research through sustained interaction with academics and health services’ (Rycroft-Malone et al., 2011) (pp.1). The letter was signed with blue ink so respondents knew it had not been photocopied, as this is said to improve response rates (Bowling, 2014). Additionally, financial incentives were offered, with all respondents being entered into a prize draw to win a shopping voucher for the value of £25 (Simmons and Wilmo, 2004). Pre-paid envelopes for return of the survey were also included (Bowling, 2014, Dillman, 1991). Reminder letters were sent to non-respondents after two weeks, along with another copy of the survey and cover letter. In addition, the survey was advertised through a range of channels targeted at the respondent group, such as at events and in newsletters. Informed consent was sought from the care home owners and managers, ensuring they understood the study requirements, protocol, and any risks and resource requirements.

Consent was obtained by asking the participants, if they consented to taking part in the study, to complete the postcode and name/number of their home in the appropriate fields. Where the care home manager was not the home owner, they were advised that it was their responsibility to gain consent from the owner to participate.

* 1. Ethics

The survey was reviewed by the University of Sheffield School of Health and Related Research (ScHARR) ethics committee to check that it would not embarrass or cause harm to the participants or be too time-and that the appropriate plans were in place for confidentiality and data storage prior to distribution (Bowling, 2014, University of Sheffield, 2016) A final copy of the survey can be seen at Appendix 4.

One ethical concern addressed was the confidentiality of the participants following the recording and reporting data (Brookes., 2017). To mitigate this risk, all of the surveys were anonymised by removing details of the home and replacing them with unique reference numbers (ESRC, 2017).

To ensure the data were secure, the surveys were stored in a locked draw in a locked room. When inputted onto the computer, they were saved onto a secure drive, which was password-protected. The data will be kept for five years following the project, and then destroyed (Jisc., 2017).

* 1. Participants

For the purposes of this project, a care home is defined as, 'any nursing or residential home registered with the Quality Care Commission where mainly older people live' (Care Quality Commission, 2015).

Care homes fitting the eligibility criteria were identified through the Care Quality Commission directory on its website. Care home managers registered at care homes which housed people over the age 65, and were registered on the CQC directory, and located within the CCG Yorkshire and The Humber boundaries (2013) were approached. The age criteria was chosen as it was in conjunction with the CQC age bands, with '65 and over' being the highest age care band (Young et al., 2011). Care homes registered as caring for people both over and under the age of 65 were excluded to ensure the survey responses were focused on older adult care. The most up-to-date CQC data at the time was gathered on 13 January 2016, and was used to identify eligible homes for the survey.

* 1. Identifying homes

Care homes were identified from the CQC data available for download from the website (Care Quality Commission, 2016). Nursing homes and residential homes were identified using the available filters.

After application of these filters, 8399 UK homes were identified as eligible. A third step narrowed the number down to just those within the Yorkshire and the Humber region. This provided a manageable amount of data and enabled feedback from already established Yorkshire and Humber groups.

To establish which homes fell within the boundaries of Yorkshire and the Humber, the CCG boundaries of 2013 (Office of National Statistics, 2016) were imported into Arc GIS Software, along with an Excel sheet of previously identified eligible homes. Homes that fell within these boundaries were then exported and used for a mail merge to distribute the survey.

* 1. Eligibility Criteria
     1. Inclusion
* Care home manager
* Yorkshire and Humber region (as defined by the CCG, 2013)
* Registered by the CQC as caring for people over the age of 65
* Private, voluntary, and local authority care homes.
  + 1. Exclusion
* Non-managerial staff
* Outside Yorkshire and Humber (as defined by the CCG, 2013)
* Registered by CQC as caring for people under the age of 65
* NHS care homes

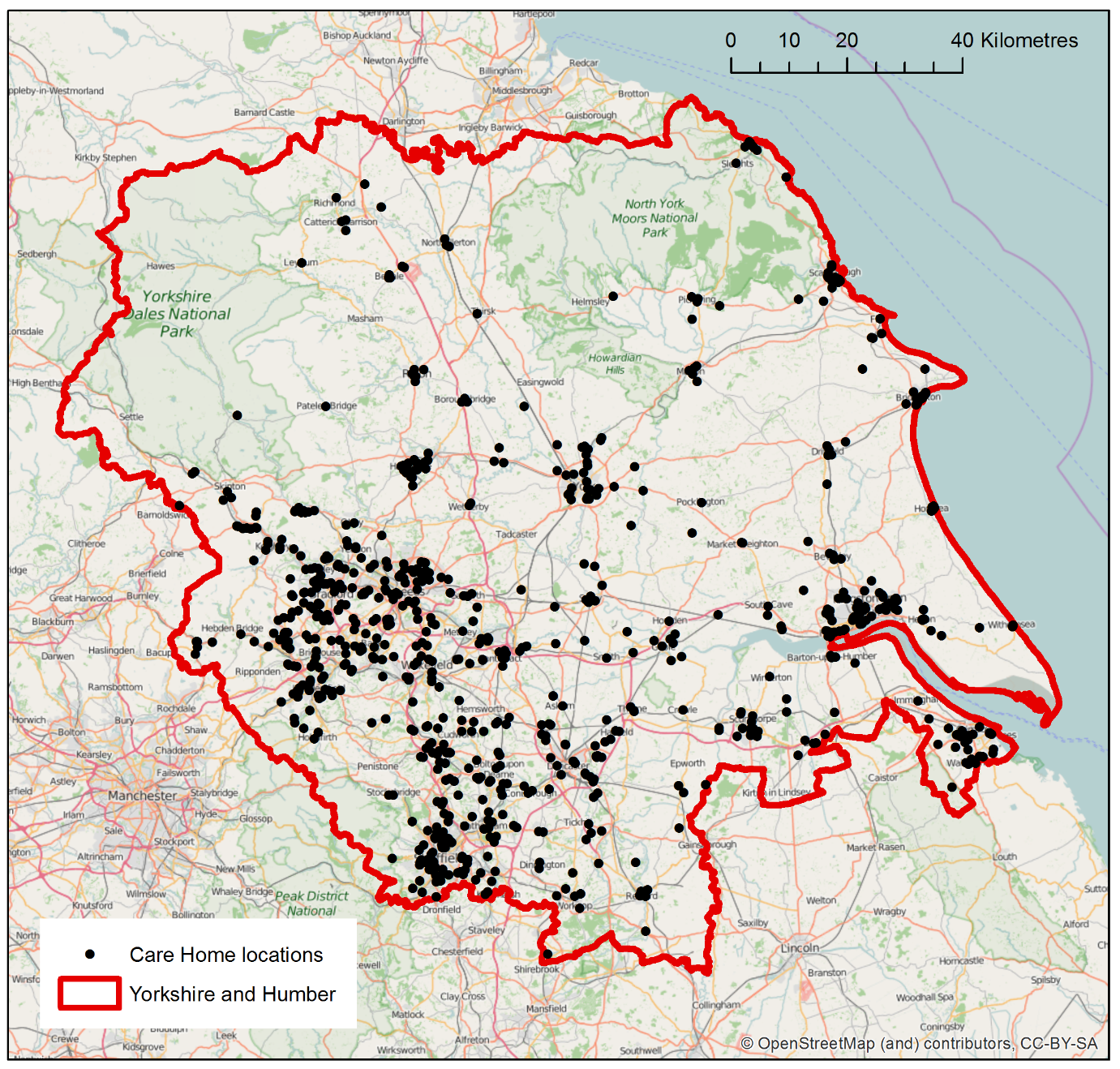


Figure 4: Map showing care homes eligible for survey mail out

Number of homes eligible for the survey: 859

Once the final survey had been drafted and piloted, it was sent by post to care home managers in Yorkshire and the Humber region.

The following chapter describes the findings of the survey. A summarised version of these findings have also been published (see Appendix 5).

* 1. Findings from the survey

A total of 131 (14%) responses were received, with six surveys excluded as the managers did not indicate that they consented to the results being used for the study. It was requested that care home details be completed if consent were given, and these responses had been given anonymously. Additionally, another respondent had responded twice, so the initial response was included and the second excluded. Of the eligible responses, 11 respondents replied online, and 113 returned a paper copy in the post. Of these, three were responses from the pilot. The participants were not asked to complete the survey again, and one home from the initial interviews withdrew at this stage.

In addition, 46 respondents replied to say that their youngest resident was under the age of 65. These data were not excluded as this would have significantly reduced the amount of data, but this should be considered when viewing the results. For this section, 124 responses were reported on in total.

* + 1. Response Rate

Table Number of responses by Local Authority

|  |  |  |
| --- | --- | --- |
| **Local Authority** | **No. of responses** | **%** |
| **Barnsley** | 5 | 4.03% |
| **Bradford** | 13 | 10.48% |
| **Calderdale** | 4 | 3.23% |
| **Doncaster** | 2 | 1.61% |
| **East Riding of Yorkshire** | 13 | 10.48% |
| **Kingston-upon-Hull** | 2 | 1.61% |
| **Kirklees** | 8 | 6.45% |
| **Leeds** | 13 | 10.48% |
| **North East Lincolnshire** | 2 | 1.61% |
| **North Lincolnshire** | 5 | 4.03% |
| **Nottinghamshire** | 1 | 0.81% |
| **Rotherham** | 4 | 3.23% |
| **Sheffield** | 10 | 8.06% |
| **Wakefield** | 5 | 4.03% |
| **York** | 5 | 4.03% |
| **North Yorkshire** | 32 | 25.81% |
| **Total** | **124** | **100.00%** |

Table 11 gives a breakdown of results by local authority, with most responses being received from North Yorkshire (25.81%), the East Riding of Yorkshire (10.48%), Leeds (10.48%), and Bradford (10.48%).

When analysing rural/urban classifications (an official statistic used by the UK government to distinguish between rural and urban areas) (Gov.uk., 2017), over 70% of homes that reported using videoconferencing were in urban areas, and the remaining rural.

* 1. Background questions

Questions about home and staff (Q1-6)

**Question 1:** Is your home:

Table Responses broken down by care home ownership

|  |  |  |
| --- | --- | --- |
| **Ownership** | **Number of respondents** | **%** |
| **Private** | 94 | 75.81% |
| **Voluntary/ not for profit** | 17 | 13.71% |
| **Local authority** | 9 | 7.26% |
| **Missing** | 4 | 0.81% |
| **Total** | 124 | 100% |

Table 12gives a breakdown of responses by home ownership, with the majority of the respondents reporting that they worked in privately-owned homes (76%)**.**

**Question 2:** Is your home: (Residential, Nursing, both nursing and residential)

0

10

20

30

40

50

60

70

80

Residential

Nursing

Both Nursing and

Residential

Other/ Missing

**Number of Respondents**

**Type of Care Home**

**Number of Respondents by Type of Home**

Figure 5: Respondents broken down by care home type

Figure 5shows the responses by 'type of home', with the majority of responses coming from residential homes (76), and 29 from homes that were both nursing and residential, and 16 from nursing homes.

**Question 3:** Approximately how many hours are contracted to each of the following per week?

Table Break down of hours contracted per position per week

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Least** | **Most** | **Average** | **Excluded** |
| **Senior management** | 0 | 410 | 101.11 | 13 |
| **Nursing** | 0 | 560 | 148.49 | 9 |
| **Care staff** | 0 | 4858 | 778.42 | 12 |
| **Domestic staff** | 0 | 630 | 307.60 | 11 |

Table 13 shows that the most frequently employed members of staff are care and domestic staff, and these are contracted the greatest number of hours per week. The lowest number were senior management and nursing staff.

However, discrepancies were noted where respondents provided results that were not in keeping with the format of the question, thus some respondents may have misinterpreted the questions.

**Question 4:** Current age of residents

The mean score for the youngest resident was 64.44. The range was 18-84, with 48 homes recording their youngest resident as being under the age of 65.

The mean score for the oldest was 97.66, with a range of 64-109.

**Question 5:** How many residents currently live at the home?

The largest home reported 123 residents, and the mean was 34.06. The range was 3-123. Two homes marked the number of residents as 0, and five did not respond.

**Question 6:** Approximately what % or number of the residents do you accommodate from the following backgrounds.

All of the care home managers reported 'White British' as the most common ethnicity among their residents. However, Asian or Asian-British residents made up 15% of the population of one home, 2% of another, and 1% of two others. Another respondent stated that 1% of their residents were Black or Black British, and 'Mixed White' people made up 5% of one population and 1% of another.

Here again, some respondents (15) appeared to reply with the number of residents of each ethnic group, but the majority (105) recorded the percentage. Four respondents did not complete this question.

**Questions about resident's healthcare needs (Q7-11)**

**Question 7:** **Tick (✓)** which of the conditions your residents have?

Figure 6 Conditions prevalent in care homes as reported by respondents

Figure 6 shows that elderly frail and incontinence were the two most reported health conditions of residents, followed by diabetes and physical disability. The least cited health problem was pressure ulcers. Twelve respondents also reported other health problems among their residents, such as; multiple sclerosis, learning disabilities, respiratory support –trachy – CPAP, Down's syndrome, respite, substance use, end of life care, mental disorder(s), older adults, any vulnerable adult & brain related injuries.

**Question 8:** How often does the home access the following services? (Never, Not relevant, Less than once a week, Once a week, Several days a week, Everyday)

Figure 7 Frequency of service use as reported by respondents

Figure 7 shows that the most frequently used health service reported by respondents was onsite nursing, followed by district nurses and unscheduled GP visits. Emergency 999 calls was one of the least used services, along with GP out-of-hours services and ICT (information communication technology) for healthcare.

**Question 9:** Is your home currently implementing any initiatives to help reduce hospital admissions? (e.g. Airedale Hospital 'assess to admit' scheme, or CCG-owned beds) ('yes' or 'no')

Table : Number of homes currently implementing initiative to reduce admissions

|  |  |
| --- | --- |
| **Response** | **Number of respondents** |
| **Yes** | 63 |
| **No** | 55 |
| **Missing** | 6 |

Table 14 shows that 68 care home managers reported implementing initiatives to reduce hospital admissions. Initiatives included Airedale Telehub, with nine mentioning the nurse hub, and one home was using the 'gold line' service.

Other ICT initiatives included the NHS helpline, out-of-hours/111, ICT beds, and ECP devices.

Ten further mentioned links with GP services, e.g. GP-LES-weekly, GP clinic on site, regular input via GP, GP link practice, weekly reviews with GP surgeries, GP by Pass Number, liaising with GPs to provide joint care plans, and same doctors practice for all clients with dedicated GP.

Some respondents reported liaising with other services, such as the RATL and FEAST teams; getting district nurse input; Monitors involve all agencies if we have a problem - i.e. falls, care home liaison team, etc.; regular district nurse checks; use of FRT nurses; involvement of the care homes clinical nurse specialist team; working more with ANP, 111 out-of-hours assess/falls team/CPN team/rapid response team; and weekly visits by the nurse, mental health teams, and an ECP service.

Others stated that they were trying to increase the skill base of the care home staff through training to replicate the hospital ward environment, and/or that they had additional services in the home, such as: step-down beds in the rehab unit; +3 beds; a falls clinic; a physiotherapist; falls prevention/physiotherapist; an enhanced care home scheme; intermediate care beds; in-house hospice; clinical interventions increased on site; advanced care planning; hospital beds in situ; and rehab beds. Others mentioned procedures to prevent admissions, such as early intervention and CCG-owned beds, and initiatives to treat within the home.

**Question 10:** Does your home have access to (please tick (✓) one for each of the following) ('yes', 'no', 'don't know')

Table Table showing what technology respondents have access to

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Wi-Fi** | **Broadband** | **Telephone** |
| **Yes** | 106 | 100 | 120 |
| **No** | 13 | 13 | 0 |
| **Missing** | 4 | 8 | 4 |

Table 15 shows that the majority of homes have access to basic technology, but that there are still homes without access to Wi-Fi and broadband (number=13).

**Question 11:** Have you ever heard of videoconferencing being used as a method of healthcare delivery? ('Yes' or 'no')

Approximately two-thirds (62%) of respondents (77) had heard of videoconferencing as a method of healthcare delivery.

*'If yes, please select what purposes you are aware of it being used in.'*

Figure 8 Breakdown of results - what purposes respondents had head videoconferencing being used for

Figure 8 gives a breakdown of the purposes for which respondents had heard of videoconferencing being used. Advice (57) and assessment (52) were the most popular, and rehabilitation (8) the least popular.

* 1. Section 1: Respondents were asked to complete this section if they were in a home that was not currently using videoconferencing.

**Question 1**: Which statement best describes your views on videoconferencing;

Table Shows views on videoconferencing, from homes that have not yet implemented it

|  |  |
| --- | --- |
| **Statement** | **Number of respondents** |
| I would sign up for it today if I could | 14 (11.29%) |
| I would love to have it, but will be unable to due to circumstances outside of my control | 10 (8.06%) |
| I would consider it, but I need to know more | 48 (38.71%) |
| I am not sure it would be worth having as we already have systems that work well | 20 (16.13%) |
| I think it is unnecessary and would only install it if it was made compulsory | 14 (11.29%) |
| Other/ missing | 6 (4.84%) |

Table 16 indicates that 39% of respondents reported that they would consider videoconferencing,but would need to know more. This was followed by 16% saying they were not sure itwould be worthwhile, as they already had other systems that worked well. Another 11% thought it would be unnecessary, and 11% said they would sign up for it today if theycould.

**Question 1a.** If videoconferencing *is* something you think would be a good idea, what are the main reasons? Please rank statements (1-7) with 1 being the reason which best describes your reason and 7 being the statement that least describes your reason).

Respondents who reported not using videoconferencing were asked to complete either this question or 1b, depending on how they felt about videoconferencing. They were then asked to rank a set of statements depending on the level of agreement to the statement. Ranking the statement as 1 indicated that this best described their view, ranking the statement as 7 indicated that this least reflected their view. Numbers could only be used once and all statements should have been allocated a number. Of those that responded, 68 completed the question incorrectly – either ticking, using the ranking system incorrectly, or only partly completing the question. Additionally, 11 respondents completed both questions (1a and 1b), one home completed this section who had reported using videoconferencing, and three respondents did not complete this section. (The 12 who reported using videoconferencing were not required to respond.) Of the 30 who completed this section (1a and 1b) correctly, 17 respondents correctly completed this question using the ranking system requested. Responses that were incorrectly completed were excluded, as were those with responses to both questions.

Table Shows most and least popular reasons why homes think videoconferencing would be a good idea

Low level of agreement

High level of agreement

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Statements available for ranking** | **Reduce staff workload** | **Improve staff confidence** | **Reduce cost** | **VC is as reliable as face to face** | **Reduce admissions** | **Improve quality of care** | **Faster access to services** |
| **Total sum of ranking** | 96 | 86 | 81 | 71 | 48 | 47 | 47 |

Table 17 shows that staff workload was ranked the lowest, indicating respondents were less likely to consider videoconferencing to be a benefit in this area. In other words, it was the least favoured reason for possible implementation.

The most commonly given reason was faster access to services and improved quality of care, with these being further up respondents' priority lists.

Other reasons for implementing included that the homes would need to know more, and one mentioned concerns about how the system would be used for residents with dementia.

**Question 1b**.If videoconferencing IS *not* something you think would be a good idea, what are the main reasons? Please rank statements (1-7) with 1 being the reason which best describes your reason and 7 being the statement that least describes your reason).

Thirteen respondents correctly completed this question using the ranking system. Ineligible responses were excluded.

Table : Shows most and least popular reasons why homes think videoconferencing would not be a good idea

Low level of agreement

High level of agreement

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Statements available for ranking** | **Do not have confidence in technology** | **Training staff time consuming and problematic** | **Not convinced it will help save money** | **Time consuming** | **VC is a threat to 'good care'** | **Already have adequate access to services** | **Residents not comfortable being seen this way** |
| **Total sum of ranking** | 89 | 72 | 72 | 57 | 53 | 44 | 33 |

Table 18 shows the concern ranked the least important when deciding whether or not to implement videoconferencing was the confidence to use the technology. However, the most common reason put forward for not wanting to implement videoconferencing was, 'Residents not comfortable being seen in this way', followed by, 'Already have adequate access to services'.

Other concerns were related to money, with one home stating that it would 'only save the NHS money and cost private care homes more', and another stating that their residents liked the reassurance of being able to see a GP, and that it was too impersonal.

Comments section: respondents were given space to comment if they felt necessary, and to expand on any parts of the survey on which they wished to elaborate.

Positives

* *Would be willing to trial in care home. Already trialling care first software for CCG.*
* *I previously used videoconferencing at the previous home I managed in Hull. However, there doesn't seem to be the same access to services in East Riding.*
* *I think it would be a good idea.*
* *I think it would a fantastic addition to our services.*
* *Sometimes advice is needed or something needs to be looked at ASAP; i.e. skin condition. This would help speed things up, so we would be able to deliver better care.*
* *It is extraordinarily difficult to have a GP visit any of our residents to admit to hospital, which is a NHS resource. I am absolutely convinced videoconferencing would be accessible enough, and I think it would be good, but think our residents would be distrusting of it.*

Negative

* *Many residents and families prefer to discuss issues face-to-face and feel comfortable with this. I also feel you can pick up signs by physically touching/seeing the patient.*
* *There are better ways to save money and bedside manner* [is important]*.*
* *The people that we care for are very reliant on face-to-face meetings. They are generally distrusting of technology. We have a responsibility to protect the choices our residents make. At this age, people are very reliant on 'the medical model'. This is a practitioner examining them and making a decision about their care in their environment. Somebody on a video link may feel too remote and not personalised enough. Dementia patients often have difficulty verbalising their problems/symptoms and a physical examination may be absolutely necessary, as is the immediate diagnosis, e.g. in the case of UTI/infection.*
* *My only concern is that service users would not be able to have a physical examination, though I'm sure if this was required the GP could arrange a visit or I could request a visit.*
* *Personal contact is the only sufficient way.*
* *We are a small home of ten residents. The use of technology like this is time-consuming and takes staff away from the hands-on care we provide. Residents are not familiar with all the new technology and 90% have dementia, which would make it difficult to get them to interact and benefit from the use of it.*
* *I believe that good care relies on proper face-to-face consultations. I am not saying the videoconferencing does not have a place in healthcare, but I feel that it is not a good idea for elderly people, especially the very elderly and frail. What I would like to see is a regular GP 'clinic' visit to the home. This would prevent call outs.*
* *As part of a large organisation, we do not have the facility to do this. It would have to be collectively across the organisation and so to the board of trustees.*
* *The unit is a respite service provider and so videoconferencing would be quite difficult to set up. The people who use this service may stay from one day up to two weeks, depending on the allocation/assessment for support needs required. Some people only access the unit once or twice a year.*

There were nine negative comments and only six positive, meaning concerns about the system seemed to be more prevalent than positive views. Most of the negative comments related to concerns about not being able to carry out a physical exam and how residents would cope with seeing a healthcare professional through video link, as opposed to face-to-face. There were also concerns about the impact this could have on care and how resource-intensive implementing the system could be, along with how this could affect care in the home and the logistical issues of implementing it.

The positive comments mainly expressed a belief that videoconferencing would help to speed up access to healthcare services, and reflected a willingness to give it a go.

* 1. Section 2: Respondents were asked to complete this section if they were working at a home that was currently using videoconferencing.

**Question 1:** What is the name of the service provider, if known?

Table 19 Shows break down of reported videoconferencing providers by respondents

|  |  |
| --- | --- |
| **Service** | **Number of respondents** |
| **Telemedicine** | 6 |
| **Airedale Digital Nursing Hub** | 5 |
| **Locala** | 1 |

Table 19 illustrates that the majority of respondents named 'telemedicine' as their service provider. However, 'telemedicine' is not the name of a service provider and is an umbrella term for a range of technologies. (See the literature review for a definition of 'telemedicine'). Given that the main service provider of videoconferencing is Airedale, we can assume that the service the respondents are referring to is the Airedale Telehub, but this survey was also developed to identify other services, so this is not definitive. Airedale Telehub was the second most commonly cited provider, and this is the service the researcher is most aware of.

The final one, 'Locala', has not been previously identified. Following some research, it appears that the Locala system is a means of delivering more integrated community services through using mobile networking, with appointments made with a clinician through videoconferencing technology (Indian Muslim Welfare Society, 2015). However, this had not yet been trialled by the home, so all of the questions following this one were left unanswered. Unfortunately, they respondent did not wish to participate further, so could not be used as a case study.

**Question 2:** What date was it installed?

Table 20 Shows years that videoconferencing was installed in respondents homes

|  |  |
| --- | --- |
| **Year** | **Number of respondents** |
| **2012** | 1 |
| **2013** | 2 |
| **2014** | 4 |
| **2015** | 2 |
| **2016** | 1 |

Table 20 shows that the majority of respondents using videoconferencing had installed their systems in 2014, with just one installing it as early as 2012, and another in 2016. Two respondents did not complete this section.

**Question 3**: Please rank the reasons why your home decided to install videoconferencing. Please rank statements (1-7) with 1 being the reason which best describes your reason and 7 being the statement that least describes your reason).

This question saw the same problems as the other two ranking questions (1a. and 1b. in Section 1). Again, ineligible responses were excluded. There were no missing responses, but only four respondents completed this section as requested.

Table Shows reasons why homes thought installing videoconferencing would be a good idea

Low level of agreement

High level of agreement

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Faster access to services** | **Improve quality of care** | **Increase staff confidence** | **Reduce admissions** | **Reduce cost** | **Reliable as face to face** | **Reduce staff workload** |
| **Total sum of ranking** | **11** | **13** | **16** | **16** | **18** | **21** | **23** |

The most popular reason given for installing videoconferencing was a belief that videoconferencing would increase the speed at which services could be accessed. This is consistent with the findings from 1a. in Section 1, in which this belief was strongly associated with a willingness to consider implementation of videoconferencing.

Reducing staff workload was the least cited reason, which again is in line with the findings from 1a section 1, where this was ranked as the least popular reason for considering implementation.

**Question 4:** The hardware is composed of the following… (Laptop and web camera, Tablet (e.g. IPad), Computer and web camera, phone or other)

All but one of the respondents responded that the hardware was composed of a laptop and web camera. One other home stated that their equipment was a tablet. (This was the same home that noted using the Locala service.)

**Question 5:** Do residents use the system without help?

The respondents unanimously responded no to this question, with residents in all of the care homes struggling to use the system without support from staff.

**Question 6:** How would you rate videoconferencing for the following…

Table 22 Breakdown of how homes rated videoconferencing for different purposes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Diagnosing** | **Assessing** | **Developing a treatment plan** | **As a triage/ gateway to other services** | **Offering advice** | **Managing long term conditions** | **Rehabilitation** |
| **Very Good** | 3 | 4 | 3 | 5 | 7 | 3 | 2 |
| **Good** | 4 | 7 | 2 | 3 | 3 | 2 | 1 |
| **Poor** | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| **Very Poor** | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| **N/A** | 1 | 0 | 2 | 1 | 0 | 3 | 4 |
| **Missing** | 3 | 1 | 5 | 2 | 2 | 4 | 4 |

It is apparent here that videoconferencing was most highly rated for 'assessment' and 'offering advice'. Both of these were ranked as either predominantly good or very good. Rehabilitation had the worst ranking, with four respondents marking it as very poor for this, and another four choosing 'N/A'. Four responses were missing, implying that videoconferencing is not widely used for this purpose.

**Question 7:** In which conditions is it used?

Figure 9 Shows the conditions videoconferencing is being used for, as reported by respondents

As shown above (Figure 9), videoconferencing seemed to be most commonly used to address problems linked to being 'elderly frail' or 'elderly mentally impaired' (EMI), and incontinence the least frequently associated condition.

**Question 8:** Approximately how often is videoconferencing used?

Table shows breakdown of how frequently homes reported using videoconferencing

|  |  |
| --- | --- |
| **Frequency** | **Number of respondents** |
| **Less than once a week** | 8 |
| **Once a year** | 1 |
| **Less than 3 days a week** | 2 |
| **Missing** | 1 |

Here, it was reported that most homes used videoconferencing less than once a week, with eight out of 12 homes reporting this. Just one home reported using it once a year.

**Question 9:** When is videoconferencing most likely to be used: morning (06:01-12:00), afternoon (12:01-18:00), evening (18:01-00:00), or night (00:01:06:00)?

Figure 10: Shows a breakdown of the use of videoconferencing by day and time

Figure 10 illustrates that videoconferencing was most likely to be used on Friday, Saturday or Sunday evening; closely followed by nights and evenings between Monday and Friday. It is least likely to be used on the afternoons of Monday to Thursday.

**Question 10:** How would you rate videoconferencing as a method of healthcare delivery? (Options included: Very poor, poor, good, very good and don't know)

Figure 11 Shows how respondents rated videoconferencing overall

Figure 11 shows that all respondents (with the exception of one, which was missing) rated videoconferencing overall as being either good (5) or very good (6), reflecting a very high rate of satisfaction with the service. The less satisfactory options were not selected.

**Question 11:** How would you rate the following…

Figure 12 Shows hoe respondents rated different aspects of videoconferencing

Figure 12 shows that technical support, time to be put through to remote sites, and staff confidence were rated the highest by videoconferencing users. This was followed by reliability and usability, which were rated as 'good'. Accessibility appeared to be the lowest rated, with one participant rating this as 'very poor'.

**Question 12:** In your opinion what effect has videoconferencing had on the following…

Figure 13 Shows how respondents rated the effect of videoconferencing on outcomes

The figure above shows that, with regards to outcomes, respondents saw the greatest improvement in staff confidence, followed by resident comfort. Workload, resident satisfaction, and the mental health of residents were rated as the lowest, and one respondent rated continuity of care as being much worse.

Finally, a number of additional comments were made by respondents.

Positives:

* *All our service users would rather stay in the home than attend hospital. We have found even if an admission is necessary, Telemed provide the best route to the ward/department we need, avoiding going through A&E.*
* *The video linking is excellent and the system works brilliantly – the main problem is the out-of-hours GP service, where delivery is poor (i.e. dates not available or taking ages to attend).*

Other:

* *Unfortunately, we have not yet had the opportunity to use it.*

All of the homes that commented did so to praise the systems (with the exception of one home which had not yet had the opportunity to trial the system).

* 1. Discussion

The aim of the survey was to explore the use of videoconferencing as a means of access to healthcare in care homes, with a focus on knowledge of, attitudes to, and views of videoconferencing in Yorkshire and the Humber, England.

The greatest number of responses were from privately-owned residential homes and care homes. The greater number of responses from residential homes may explain why care staff were reported as being contracted the greatest number of hours. The higher rate of residential home responses may reflect differences in provision or in interest in videoconferencing.

Of the respondents that reported using videoconferencing, 77% were based in urban geographical codes and 22% in rural. This is an interesting, given that the theory suggests videoconferencing would be of greatest benefit to geographically isolated homes (Newbould et al., 2017). This suggests that the uptake of videoconferencing may be more heavily influenced by non-geographical factors.

Attempting to identify residents of a certain age highlighted a problem with the CQC data as many respondents reported the age of some of their residents to be under 65 (Chapter 9), despite them being registered as caring for people solely over the age of 65 on the CQC database. The most frequently employed members of staff were care assistants and domestic staff, which may reflect where the burden of work falls amongst care home staff.

The average care home cared for 35 residents, meaning most of the homes were relatively small. With nearly all of the care homes reporting 99-100% of their residents as White British, this reflects a lack of diversity in language and culture in care homes. This may reduce barriers to the use of videoconferencing, as language and cultural barriers do not need to be addressed as readily as in other studies (Yeung et al., 2009).

The most common health conditions reported were incontinence and 'elderly frail', and most homes accessed on-site nursing, district nurses, or using unscheduled GP visits. The least often used were 999, out-of-hours, and ICT (information communication technology) services. This may indicate a lack of confidence in using ICT or technology-enabled services, as the most frequently accessed services required the presence of a healthcare professional. An alternative explanation may be the need for a resident to be physically examined, which technological services cannot provide directly.

There seemed to be a general awareness of how important it is to reduce hospital admissions, with over half of respondents reporting some kind of initiative with this aim. Again, the majority of the services relied on face-to-face contact, with most reporting initiatives that included GPs, community services, or upskilling care home staff. This is an interesting finding, considering that most homes reported access to basic IT services, with over half of respondents having heard of videoconferencing as a method of healthcare provision, particularly for assessment and advice. This suggests a general distrust of technology. Further findings reinforce this, with the majority of respondents stating that they would need to know more before implementing it, or that they were unsure of whether videoconferencing would be worthwhile as they already had access to adequate services. However, homes that had implemented the services rated them as either very good or good, suggesting a significant link between confidence and experience; though whether the confidence increased the likelihood of use, or vice versa, is unclear. Only 12 respondents reported using the system.

The most common reason for implementing the system was 'faster access to services'. This was ranked as the most important by both respondents who had not yet implemented videoconferencing, and those who had. Additionally, those who had not yet implemented videoconferencing also strongly predicted improved quality of care.

The most common reason for not implementing the system was the potential discomfort of residents being seen in this way. This suggests that the system is perceived as being disadvantage in relation to other services due to the lack of face-to-face communication, and this may hinder uptake. Similarly, failings of the alternative services in this area may drive uptake. Confidence in use of ICT was not highlighted as an issue, suggesting this may not be a significant barrier to uptake.

The main provider was reported as Airedale, with the service being mainly used for assessment and advice. Fewer respondents reported using videoconferencing for rehabilitation. The system was predominantly used for the conditions of 'elderly mentally impaired', 'elderly frail', and disabled. Calls were most likely to be made on Friday, Saturday, and Sunday evening, suggesting that dissatisfaction with the currently available out-of-hours' services may be a driver to uptake.

Overall, videoconferencing was rated as being very good or good, meaning that post-implementation, users are generally happy with the service. Technical support, time to be put through to a member of staff, and staff confidence were rated the most highly. This is in line with the findings that speedier access to services is important, and that staff confidence in using the system was high, suggesting that technical barriers may not be a significant problem. The greatest impact was on staff confidence, with staff becoming more confident in managing resident care as a result of having access to the system.

For challenges in conducting this survey, see Chapter 9.

* 1. Conclusions from survey

Overall, videoconferencing was rated highly for most aspects, with the exception of accessibility, which was considered a problem by one care home. The overall findings suggest that respondents are distrusting of technology, though post-implementation, staff were happy with the service. However, one of the main drivers of uptake appeared to be current access to services and perceived relative advantage(s).

When selecting the case studies, only 12 said that they used videoconferencing, and just nine of these agreed to be approached for further study. None of these were run by the local authority. Due to this low response rate, there is a chance of respondent bias. This will be assessed through the survey responses, but it may mean that homes which are very unhappy with the service are under-represented. When identifying homes that used videoconferencing, there was a limited sample to choose from. However, of those that did respond, Section 2 – Question 6 (pp.71) was used to identify the range of purposes for use, and Section 2 – Question 7 (pp.88) was used to identify the conditions for which videoconferencing was used. This criterion was used to define uptake. The date videoconferencing was implemented was used to identify homes that had managed to sustain use (Chapter 6.4.6). There was a high response rate from homes that did not use videoconferencing, which made selection of a home for this study much easier.

This chapter described the findings of the survey and identified a number of homes using videoconferencing for a range of purposes and to varying degrees, and identified others with no plans to implement videoconferencing. The next chapter outlines the rationale for a complex evaluation, and the theories that underpin uptake and sustainability of interventions.

Chapter 5: Study 2: method for in-depth evaluation

The previous chapter discussed the results from the survey, and identified factors that may affect the uptake and provision of videoconferencing in care homes. The following chapter introduces a realist evaluation, and adheres to the reporting standards set out by Ramses II (Wong et al., 2016). It begins by addressing the points in the introduction, offering a rationale for a complex evaluation (5.1), outlining key theories that may influence uptake and sustainability of technology in care homes (5.2-5.4), and discussing the aims and objectives of the evaluation (5.5). It then goes on to discuss the rationale for using a realist evaluation (5.7), the programme being evaluated (5.9), the study design (5.10), the data collection methods (5.11), the recruitment process (5.12), the sampling strategy (5.12), and the data analysis (5.13). Although a description of the environment where the evaluation took place is usually included, this was covered in Study 1 ('Findings from survey', 4.11) and at the beginning of each case study in the realist evaluation results chapter (Chapter 6).

The ethics approval, can be located in section 6.6.2.

5.1 Rationale for Evaluation

Due to a wide range of variables that could influence the uptake and sustainability of videoconferencing, a methodology is proposed to take account of the complex nature of the setting. Pawson (2013) outlined seven key areas for which a methodology must take account. These are as follows.

1. **Implementation** – Where there is a chain of individuals and/or institutes involved in implementing the programme on the ground, and great diversity in the flow, the intervention may be influenced. The chain of implementation for videoconferencing will involve many different institutes or individuals. For example, the Airedale videoconferencing service includes the following (NHS Airedale Bradford and Leeds, 2012);

Figure 14 Implementation chain for Airedale Telehub (NHS Airedale Bradford and Leeds, 2012)

1. **Contexts** – This is pertinent where the context varies at the macro and micro levels, and takes into account factors such as organisational setting, geography and different stakeholders, all of which can again influence the outcome of the intervention. When considering videoconferencing, there is a range of contexts that could influence the outcome of the intervention. These include geographical area (rural/urban), type of care home (nursing/residential/both), resources (funding/staffing), conditions of residents (e.g. dementia), and the size of the home (e.g. number of residents).
2. **Outcomes** – The multiple outcomes of the programme may be contested as internally complex, e.g. how can you attribute an outcome to one factor?

For videoconferencing, there are a range of different outcomes and it is difficult to attribute these outcomes to contextual factors (mechanisms). For example, if a resident states that they do not go into hospital much, it would be difficult to attribute this outcome solely to videoconferencing, or to the resident's general health and comorbidities. The complexity of these links needs to be examined.

1. **Rivalry** – This takes into account other interventions that may affect the outcome of the intervention. For example, the Airedale NHS Trust has an 'assess to admit scheme', which was part of the Airedale Trust strategy to avoid unnecessary admissions. For this scheme, patients that are routinely admitted are first assessed and tested before deciding whether they need to be admitted at all (Hex and Wright, 2015). It is important to identify whether assessing residents under this scheme or using videoconferencing is reducing admissions, as proposed in the report by the York Health Economics Consortium (2015).
2. **Emergence –** This is where the intervention's context actually changes over time. For example, videoconferencing may no longer be seen as a new intervention, but as part of the care system, and thus may change the workload/duties of the staff. Staff may change their way of working to accommodate videoconferencing, and thus it becomes difficult to establish how they successfully integrated and adapted their behaviour. Again, this could be taken into account in a complex evaluation by comparing homes at different levels of integration (Pawson, 2013).

In order to evaluate complex interventions, the grand and middle range theory for the intervention needs to be identified first to inform the development of programme theory. The grand and middle range theories below derived from and helped develop the programme theories identified in the case study fieldwork. The theories were identified, tested and refined throughout (Pawson, 2013).

5.2 Grand/ middle range theory

Theories related to technology acceptance and diffusion were not included in the following chapter because they did not adequately explain the findings of this project. This is supported by the work of Legris et al. (2003), who found the technology acceptance model (TAM and TAM2) explained only about 40% of a system's use, and that implementation had a strong link with organisational dynamics (Legris et al., 2003). The following chapter outlines organisational and individual level theories to explain the results of this study.

* 1. Organisational theory: organisational readiness for change

Previous work building on Lewin's three-stage model of change (1947) has provided useful information about fostering organisational readiness. On this basis, the first theory to be considered was Weiner's (2009) research around the theory of organisational readiness for change. This builds on Lewin's work, by defining organisational readiness, outcomes, and a theory of change. Structural attributes such as resources do not form part of the definition because they are seen more as a matter for the staff member's judgement in regards to change efficacy (belief in the team's ability to affect the change). The theory is therefore described more in psychological terms (Weiner, 2009) than structural terms (Al-Haddad and Kotnour, 2015). This theory most adequately explains the findings of this research.

Weiner (2009) defines organisational readiness for change as, 'A shared team property… A psychological state in which organisational members feel committed to implementing an organisational change and are confident in their collective abilities to do so' (Weiner, 2009). The theory is said to be composed of a shared vision to implement change (change commitment) and a shared belief in the team's ability to affect the change (change efficacy) (Weiner, 2009). Organisational learning is one example of collective ability. In contrast, where some staff are committed to implementing the intervention and others are not, this is problematic for teamwork. The theory suggests that when both organisational change commitment and change efficacy are high, this will lead to more successful implementation, providing that the intervention is well designed. If the intervention is not well designed, and change commitment and/or efficacy are low, the intervention implementation will be hindered as there will be less effort put into implementation, with staff being less likely to persevere in the face of challenges (Weiner, 2009).

To explain how interdependence in the change process might affect the uptake and sustainability of videoconferencing, individual level theories have been identified to help explain the variations in implementation in different contexts.

* 1. Theories of motivation

The first middle range theory of behaviour change considered is 'self-determination theory' (SDT). Self-determination theory is a macro cognitive theory that provides a framework for the intrinsic motivation to promote effectiveness in a variety of contexts, including the workplace. The model categorises three basic needs: competence (a person's ability to undertake the tasks required of them, with staff who do not feel competent thus feeling unable to achieve desired outcomes); relatedness (a person'sconnection with otherswithin the organisation); and autonomy (perceived control an individual has over the decisions they make, whether these are self-determined with the opportunity to reflect, as opposed to being dictated). This results in self-determination: the intrinsic motivation for effectiveness (Marylène et al., 2005) (Figure 15).

Similarities can be drawn between self-determination theory and the theory of planned behaviour, with both offering explanations for individual engagement in planned behaviour. However, self-determination theory and the theory of planned behaviour differ in that the first looks more at intrinsic motivation and factors that affect motivation, whilst the theory of planned behaviour is based on belief-based perceptions. Therefore, self-determination theory was deemed a better fit for explaining the results of the current work (Hagger and Chatzisarantis, 2009).

Figure 15 Diagram illustrating the self-determination framework (Marylène et al., 2005)

These factors will be explored in more depth, alongside the 'structural theory of power in organisations' framework (Laschinger et al., 2001).

**Rosabeth Kanter's (1979) structural theory of Empowerment in organisations framework**

Rosabeth Kanter's (1979) structural theory of empowerment is a useful model to explore theories of factors influencing organisational outcomes within care homes when implementing technology, due to the extent to which it breaks down possible causal relationships. The model is composed of three parts: forms of power, personal impact, and results in improved work effectiveness. These components are discussed separately, alongside other theories, in the following section (Laschinger et al., 2001).

**Forms of power**

Rosabeth Kanter's (1979) model proposes that formal power (job definition/recognition) and informal power (connections inside and outside of the organisation) influence employees' access to work-related employment structures, such as information, support, and opportunities (Laschinger et al., 2001).

One middle-range theory that may expand on how informal power is achieved is the work of Zeffane, et al. (2011), which looked at the relationship between trust, communication, and organisational commitment (Zeffane et al., 2011). The study found that communication was an integral part of gaining employee trust and commitment, and that face-to-face communication was the most influential tool. The paper also states that where managers were dominant, lacked a willingness to listen, were unsupportive, and/or lacked empathy, interpersonal trust was eroded (Zeffane et al., 2011).

Edmondson, A. (2001) expands on this idea, suggesting that team stability (low turnover rate and a close relationship between team members) has a significant influence on the implementation of new technology. Team stability supports the coordination of independent work, as the team is able to develop a transactive memory: team members know one another's strengths and capabilities, and can thus coordinate more effectively as a team. The paper also argues that team leader's selection of staff influences the organisational culture, stability, and psychological safety of employees. Psychological safety is the belief that one can undertake a certain task with good intentions and be free from criticism and punishment. This is important, given that the changes required when implementing new technologies threaten interpersonal safety, as users are required to ask questions and request help. This paper argues that greater psychological safety within a team fosters shared learning, as members feel able to pose questions and ask for help when needed (Edmondson et al., 2001).

**Personal impact**

Access to power structures in turn is said to have a personal impact on employees, for example increasing self-efficacy (Laschinger et al., 2001). Self-efficacy is how a person perceives their ability to undertake a task, and this is said to develop through four domains (Figure 16).

Figure 16 Components of the theory of self-efficacy (Schonfeld et al.,2017)

The four key domains are: vicarious experience, or learning through/with others (modelling behaviour); performance outcomes (past experience of undertaking the task); verbal persuasion (encouragement from others); and physiological feedback (how one feels when completing the task) (Schonfeld et al., 2017). When considering performance outcomes, another theory is put forward by Sävenstedt et al. (2004). When using videoconferencing, it is suggested that quality is associated with promotion of 'presence at a distance' and perceived presence. Factors influencing this included: the quality of the equipment, the ability to pick up on body language and non-verbal cues, and the relationship with staff at the remote site (Sävenstedt et al., 2004).

Organisational commitment may also lead to improved team stability, which in turn would lead to improved psychological safety and foster the shared learning necessary to achieve self-efficacy (Edmondson et al., 2001). Organisational commitment is another personal effect of empowerment (Laschinger et al., 2001). It is said that there are three different types of organisational commitment, each with different motivations. These are: continuous commitment, which is motivated by the potential cost of leaving the organisation; affective commitment, which is motivated by emotional attachment to others and the employee's identification in the organisation; and normative commitment, which is motivated by how obliged an employee feels to stay (Sisodia and Das, 2013).

Affective commitment is determined by the job description: the extent to which an employee feels the organisation will look after their interests, and their perception of their ability to affect change within the organisation. Affective commitment is the most strongly related to team stability (Rhoades et al., 2001). This is in line with Brehman's (1966) theory on 'individual reactance', in which individuals resist change if they are deemed to have lost freedom of choice(Burke, 2017).

Increased autonomy has also been described as having a significant impact (Laschinger et al., 2001). Autonomy is theperceived control an individual has over the decisions they make, and the sense of whether these are self-determined, with the opportunity to reflect, as opposed to being dictated. Where a member of staff does not have autonomy, they may be asked to act against their will. This supports the self-determination framework previously noted, whereby autonomy is essential for the intrinsic motivation necessary to promote effectiveness (Olafsen et al., 2016, Marylène et al., 2005).

The jobs characteristics model developed by Hackman and Oldham (1976) proposes that job autonomy is one of the most important prerequisites to job satisfaction, along with feedback. However, more recent research suggests that job autonomy may increase job commitment in higher hierarchical groups, but has little effect in lower hierarchical groups (Sisodia and Das, 2013).

Authentic leadership theory suggests that leaders foster trust, hope, and positive emotions in employees when they draw on personal experiences, and evidence psychological capacities such as self-efficacy and a moral perspective, and provide a supportive organisational climate. This leads to increased job satisfaction, commitment, and engagement, improving employee job performance (Avolio et al., 2004). Job satisfaction and motivation are noted as results of personal empowerment in Rosabeth Kanter's (1979) work (Laschinger et al., 2001).

**Work effectiveness**

The forms of power and personal impact described above are said to result in increased work effectiveness, with staff helping the organisation to achieve its goals. This leads to improved resident satisfaction, respect, and coordination amongst employees in the organisation (Laschinger et al., 2001).

Most theories suggest that leadership behaviour is the key to promoting a positive care home culture that enables shared learning and work effectiveness. If the way in which the manager runs the home is authentic (Avolio et al., 2004), and recruit suitable employees who contribute to team stability, this will in turn help the team develop a transactive memory, increase psychological safety, and improve communication and trust(Edmondson et al., 2001, Zeffane et al., 2011). This will improve shared learning (Edmondson et al., 2001). If shared learning is improved, this will help members to develop their self-efficacy (Schonfeld et al., 2017), and develop close relationships, which will result in improved job satisfaction and work effectiveness (Laschinger et al., 2001).

* 1. Evaluation questions, objectives and focus
     1. **Aim**
* To explore the factors affecting the uptake and sustainability of videoconferencing in care homes in Yorkshire and the Humber, and to establish what works for whom, and in which circumstances and respects
  + 1. Objectives

1. Select three care homes for further study, using maximum variation sampling based on results from the survey
2. Glean theories that may be affecting the uptake and sustainability of videoconferencing in care homes through theory-gleaning interviews
3. Refine and consolidate theories through consolidation and refinement interviews
4. Consolidate theories further by sending out consensus-building documents to the managers of the participating care homes for feedback on the findings
   1. Rationale for using realist evaluation

A recent article published in the British Medical Journal (BMJ) discussed how service use and research are often seen as two separate cultures and suggested several approaches that are now available to address challenges when evaluating complex and emergent interventions. It is hoped that these approaches will act as a catalyst for successful implementation of emergent services when adopted in research (Lamont, 2016).

Approaches identified as potentially being relevant for this project include the following (Lamont, 2016);

* **Quasi-experimental design** is designed to test a causal hypothesis and measures the intervention’s success using pre-set indicators (Craig et al., 2008). Although several treatment groups can be assessed, with participants each receiving unique treatment (Gefen and Ridings, 2002), this was excluded as it does not identify a range of outcomes and generative mechanisms that result in the outcome of the intervention (Pawson and Tilley, 1997). Assignment of groups is also self-selective, compromising internal validity (White and Sabarwal, 2014).
* **Complex adaptive theory** looks at interventions from a system-wide perspective/more managerial level and was therefore excluded as it was not deemed appropriate because it does not explore factors that affect the feasibility of the intervention and the user experience (The Health Foundation, 2010) *;*
* **Process evaluation** identifies whether or not an intervention has succeeded in achieving predetermined outcomes. This method was excluded because it would not be suitable due to there being a range of possible outcomes for videoconferencing, and little being known about the purposes and outcomes of videoconferencing in different contexts. This method aims to identify barriers and facilitators in the implementation process, rather than determining the most pertinent factors in achieving the best outcomes for the user (Moore et al., 2015)*.*
* **Retrospective matched control methods** require a lot of data on an individual level about episodes and use, dating back roughly two years. Therefore this method was excluded, as this level of data would be hard to obtain in a care home setting and the task would not be feasible in the given timescale (Warmington and Foreman, 2014). It also does not explore reasons for differences in great depth, and again looks at predetermined outcomes (Davies et al., 2015)*.*
* **Natural experiments** are more appropriate when large scale data are available for populations regarding outcomes and exposure. These data were not available for videoconferencing, and therefore this method would not be suitable and was excluded (Craig et al., 2012).

Developmental evaluation is also widely used for evaluating interventions that are implemented in complex healthcare settings (Patton, 2011). However, this approach was rejected as the primary research methodology as it requires a high level of collaboration with stakeholders, which would be difficult to obtain (Patton, 2011). However, one concept from the developmental evaluation, the 'inquiry framework', was used as part of the study (see 6.4.5 for more information).

Another research approach outlined in the BMJ paper was 'realist evaluation' (Lamont, 2016), and this is the approach adopted for this research. This method allows an explanation of a range of outcome patterns, including failure to adopt or sustain the innovation. It allows for generative causation, whereby mechanisms can be identified to explain outcomes in different settings (Salter and Kothari, 2014). It also allows the researcher to switch between different paradigms to meet the needs of different situations, as it is based on critical realism between positivism and relativism (Chapter 5.8) (Bowling, 2014). It identifies the most pertinent factors in producing optimal output for the intervention. Finally, it takes account of a range of outcomes, allows for the use of a range of data collection methods, and is feasible within the time and resource constraints of the project (Pawson, 2013).

The data collection methods identified and incorporated into this project include the following (Lamont, 2016)

* **Mixed methods research** uses qualitative and quantitative methods to build a complete picture of the phenomenon being studied (Bowling, 2014).In realist evaluation, using both qualitative and quantitative data is popular, with quantitative data being used to focus on outcomes and contexts, and qualitative used to generate mechanisms (Better Evaluation, 2017).
* **Case studies** consist of an in-depth investigation of a person or group of people (McLeod, 2008). Realist evaluation uses comparisons of different groups involved in the same programme to test a theory. A refined programme theory is tested in different contexts. This method is suitable, as case study selection allows for purposive sampling of cases to enable testing of the theory in all its dimensions (Better Evaluation, 2017, Kœnig, 2009).

Criticisms of realist evaluation note the ambiguity and inconsistencies in the realist evaluation model. These result in difficulties in implementing findings due to confusion; for example, context and mechanisms are defined differently by different projects (Porter, 2015). In order to address this, the definition/concept of mechanisms developed by Dalkin (2015) was used. This suggests that when a resource (the component introduced in a context) is introduced into a setting (context), it enhances the change in reasoning (mechanism), and participant behaviour results in the outcome. She states, 'Differentiating between resource and reasoning therefore helps distinguish between relevant context and mechanism' (Dalkin, 2015) (pp.4). The formula for theory development is expressed as:

**M(Resources**) + C → **M**(**Reasoning**) = O **(Outcome)**

Other criticisms include that the method is still in its infancy, and so in practice there is still a lot still to be developed and refined (Rycroft-Malone et al., 2010). Only recently have guidelines been developed on how to report realist research (Wong et al., 2016). This was addressed by regularly attending realist training and workshops provided by groups to advance the method, e.g. the Centre for the Advancement of Realist Evaluation (CARES), Liverpool. As well as keeping up-to-date with literature, the researcher was thus able to keep up-to-date with advancements in the field (Jagosh, 2017a, The RAMESES Projects, 2013-2017).

* 1. Epistemological stance
     1. Critical realism

Realist evaluation originates fromcritical realism, and has been described as, 'An integration of realist ontology (there is a real world that exists independently of our perceptions and theories) with an interpretivist epistemology (our understanding of this world is inevitably a construction from our own perspective)' *(Mitchell, 2016) (pp. 1)*.

The critical realism paradigm is said to be the least restrictive perspective, as it acknowledges that in order to respond to different situations, the researcher must be able to move between different paradigms (Mitchell, 2016) (Figure 18).

**Realism**

**Constructivism**

**Positivism**

**Deduction**

* **Testing** theory against evidence
* Experimental design
* Randomised Control Trials

**Retroduction**

* Theory **inspired** by/ or to explain evidence
* Retroduction aims to offer causal explanation' whilst overcoming the deficiencies of 'induction' and 'deduction'.
* 'Retroduction entails the idea of going back from, below, or behind observed patterns to discover what produces them.\*' (Lewis-Beck et al., 2004)

**Induction**

* Theory **derived** through evidence
* Qualitative research
* Interpreting perspectives

Figure 17 Philosophical Positioning of the Realism Paradigm. Adapted from: Jagosh J., Dalkin S., and Blane D. (2016) (Jagosh et al., 2016) (Slide 5)

Realist evaluation acknowledges that health and social care interventions are implemented into complex social settings at both macro and micro levels, with many variables influencing the outcome of the intervention. These should be understood and assessed systematically to understand how they work together to produce different outcomes; for example, why one care home may have videoconferencing successfully integrated into their care pathway, whilst another reports using it only once a year (Lacouture et al., 2015).

* + 1. Scientific realism

Realist evaluation, being a theory-driven approach, would be appropriate when seeking to uncover the complexity of the programme's inputs and complex pattern of outcomes (Abhyankar et al., 2013). It is an effective way of integrating mixed methods to produce a more complete picture of the phenomena. It acknowledges that variables are not fixed and are influenced by context (Bowling, 2014) and it is useful for developing theories where there is little evidence or pre-existing theory (Jackson and Kolla, 2012). It asks more than what works, and asks instead: what works for who? In what circumstances? In what respects? (Pawson, 2013). It is argued that this is a better means of establishing the relationship between cause and effect than other evaluation methods(Westhorp, 2014).

* 1. Description of videoconferencing service to be evaluated

Two of the six vanguard models (Chapter 1.5) use videoconferencing as an integral part of the new model of delivery. These two are discussed below.

* + 1. Vanguard Model 1

Vanguard Model 1 aims to provide a structured proactive approach to care, through mobile working for primary care. This is done by providing access to System One (a piece of healthcare software that aims to join up healthcare through the sharing of electronic medical records) (TPP, 2016). Although the report does not state in what capacity, it suggests that this model aims to increase its use of videoconferencing (NHS England, 2015, NHS England, 2016). It is hoped that this will improve care and support for care home residents with long term conditions, reduce falls, reduce hospital visits, and improve end of life care (NHS England, 2015, NHS England, 2016).

* + 1. Vanguard Model 2

Vanguard Model 2 has been providing videoconferencing since 2006, and now provides videoconferencing to approximately 546 care homes, whilst working with approximately 44 CCGs (Binks, 2017). They initially started providing videoconferencing in prisons, with the aim being to reduce cost in staff time by reducing the need for escorts and bed watches. In addition, it was expected that the privacy and dignity of prisoners would also improve. This model has now been expanded to care home residents, with the aim of improving access to healthcare and reducing unnecessary admissions and travel. An internal evaluation found the system to be successful in reducing cost and patient flow since being implemented in care homes (Airedale NHS Trust Foundation, 2014). Additionally, they aim toimprove the quality of life and end of life experience for people in Bradford, Airedale, Warfdale, Craven and East Lancashire through the use of technology.

The services to care homes include: videoconferencing (video-technology with a secure link); 'Gold Line' (a telephone and video link to the Airedale hub (see abbreviation page for a description) for advice and support for palliative care); and an intermediate 'Care Hub'. Staff can remotely access support on behalf of residents 24 hours a day, seven days a week, through these services. The intermediate care hub can be used for any health concern, to seek advice, and where necessary the hub can escalate the call to a doctor in hospital or send an ambulance or out-of-hours GP. Vanguard Model 2 also provides a link to social care: for example, if a resident falls, they can be assessed via a video link before being linked to a social care professional, where a falls prevention assessment might be undertaken in the care home (NHS England, 2015, NHS England, 2016). The intermediate care hub was the most frequently reported videoconferencing intervention (Chapter 4.11).

* 1. Description and justification of in-depth case studies

For the realist evaluation, a comparative case study design was chosen. This allows a comparison of similarities and differences between different contexts, with a large amount of quantitative and qualitative data collected to establish outcome patterns to test and refine theory (Campbell, 2012, Goodrick, 2014) (Chapter 5).

Practical limitations to the approach include the case studies often being time-intensive. To address this, only three care homes will be studied. Additionally, the time lag between case studies can reduce the reliability of results (Goodrick, 2014). This has been addressed by reducing the time as far as possible between the case studies, and conducting an iterative data collection, whereby the researcher went back and verified the theories developed. This was done by requesting feedback on the readiness assessment report (presented as a report for CCGs), upon completing the data collection (Goodrick, 2014, Susskind et al., 1999). A description of how the case studies and report complemented other forms of data collection considered throughout this study is given below, with the aim of addressing the steps necessary to refine and consolidate the findings as outlined through the realist evaluation wheel (Pawson, 2013).

**The realist evaluation wheel**

The realist wheel of evaluation science is used to demonstrate the iterative process of testing and refining theory. The initial stage (elicit programme theory) is where ideas about how a programme works are developed. This is followed by the formulation of hypotheses in the form of context mechanism outcome configurations (CMOCs) (Chapter 6.1, pp.103). Data collection is then undertaken to test the configurations, and the findings prompt revisions of the theory, or confirm the theory (Pawson, 2013). It highlights where learning occurs, but also that there are an infinite number of learning circles that can be achieved (Pawson, 2013). The wheel below (Figure 18) is used to describe the research design used. This is followed by a section on data collection, which describes the methods used in more detail.

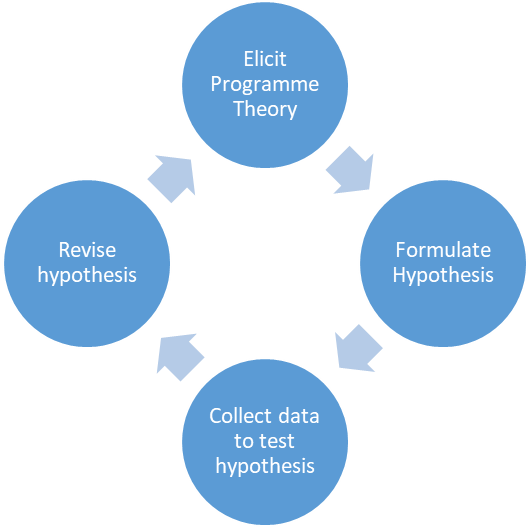


Figure 18 Realist Wheel of Evaluation (PAWSON, 2013) (pp. 88)

**Step 1: Elicit programme theory**

In order to elicit programme theory, the boundaries of the study must be defined (Rycroft-Malone et al., 2012). This was achieved by consulting two key strategic managers from two large care providers before the data collection began (pp.112). The scoping review was then explored for its potential to elicit initial theory (Chapter 3). Finally, theories were gleaned from initial interviews undertaken in Case Study 1 and the field notes. The interview methods consisted of semi-structured interviews, theory gleaning interviews, and the developmental inquiries framework. Field notes were also collected (pp.115).

**Step 2: Formulate hypothesis**

Throughout Case Study 1, areas for theory development were gleaned, and refined through comparison with Case Study 2. The interview methods used were semi-structured interviews, theory gleaning, and refinement interviews, alongside the developmental inquiry framework. Field notes were also collected (pp.115).

**Step 3: Collect data to test hypothesis**

Case Study 3 involved refining and consolidating the developed CMOCs. The interview methods used were semi-structured interviews, the inquiry framework, and consolidation interviews. Field notes were also collected (pp.115).

**Step 4: Revise hypothesis**

Theories were then consolidated and revised through the development of a readiness assessment report (in the form of a report for CCGs). Managers were asked to provide feedback on the report and the accuracy of the findings (pp.115).

* 1. Data collection

Below is a description of the data collection methods used at each step. This section also includes a note of the intended methods of data collection that were not used, and an explanation as to why they were rejected.

**Interviews with strategic managers**

Managers were questioned about the strategic objectives and priorities of their representative organisations, how the findings from the research could be focused in a way that was useful for care home providers, and how the providers they represented went about acquiring new technology (Rycroft-Malone et al., 2012). Their priorities included staffing, customer satisfaction, and opening doors for staff and customers. Therefore, a focus on the findings, time, productivity, health economics, and the experiences of staff and residents were key.

With regards to how the homes went about acquiring new technologies, one manager said that the technical team identified the problems and developed partnerships from there. They also said that they would be interested in knowing more about return on investments, the relevance of the method to digital health, funding subsidies, and technological advantages elsewhere. Another manager stated that there was a five-year business plan in which Wi-Fi technology was a key element (see Appendix 6 & 7 for consultation notes).

As a result of speaking to these providers, new questions were included in the survey regarding cost, experiences of residents and staff (benefits and challenges), training/complexity in using the system, and technical difficulties. However, the boundaries were continually considered as part of the iterative design, making decisions about theories to continue exploring.

**Survey**

The survey (Chapter 4) was developed to identify homes with different characteristics that used videoconferencing in different ways. This was to find homes to be explored further in the comparative case studies (Chapter 6).

**Scoping review**

The literature from the scoping review was used to elicit areas for theory development when addressing the uptake and sustainability of videoconferencing. However, no suitable programme theories were identified (Chapter 3.2.6, pp.45). Upon seeking advice from the CARES (Centre for the Advancement of Realist Evaluation and Synthesis) summer school 2016, the researcher took an inductive approach to initial data collection, and the theory-gleaning interviews in Case Study 1 were used to identify areas for theory development.

However, the scoping review concluded that most studies were from large countries with dispersed populations (Chapter 3), and that videoconferencing was most consistently useful for accessing remote services, when sites or professionals were geographically isolated (Augestad and Lindsetmo, 2009). As a result, this was added to the initial interview guide and then dropped from subsequent iterations.

**Focus groups**

It was intended that each case study be preceded by a small focus group with a range of stakeholders in order to glean relevant theories for the care home studied. However, this was not feasible in practice due to the time constraints expressed by care home staff and the difficulty in recruiting the sample needed in the available time (Bryman, 2012). Therefore, individual theory-gleaning interviews were used to explore how videoconferencing produced different outcomes in each care home. These helped to tailor and refine the interview guide to systematically test theories in each care home (Manzano, 2016) .

**The developmental inquiry framework**

The inquiry framework asks six basic descriptive questions: who, what, where, when, how, and by what means. It is argued that these basic descriptive questions are necessary to understand a situation completely (Patton, 2011). They are used to develop a good description of what is happening. The questions are used to identify theories or outcomes that have not been highlighted in the literature or survey. This helps to refine the realist theory developed for testing within the home (Patton, 2011), as well as helping to build on the current theory (Jackson and Kolla, 2012). Examples include 'Could you tell me about how you use videoconferencing in the home?'

**Realist interviews**

Realist interviews entail the participant being asked to provide feedback on the theories (CMOCs) the research has hypothesised (Pawson, 2013). They are more directed than qualitative interviews, as they aim to keep to the topic under evaluation, instead of eliciting interviewees' narratives. It is generally accepted that there are three main types of realist interviews: theory-gleaning interviews, theory refinement, and consolidation interviews (Manzano, 2016). The interview undertaken depends on the order of the investigation and the iterative development of the theories.

* **Theory-gleaning interviews** are designed to help the evaluator identify initial contextual factors that may impact on the effectiveness of an intervention (Manzano, 2016). Examples include, 'Could you tell me more about what situation you use videoconferencing in?'
* **Theory-refinement interviews** are where the evaluator becomes more familiar with factors that may be affecting the intervention. As a result, the questions become more structured to refine identified patterns (Manzano, 2016). At this stage, the theories were refined in line with the Dalkin (2015) formula for theory development (pp.106) (Dalkin et al., 2015). Examples of questions include: 'My previous work suggested that in the day, calling the GP or 999 would be more likely, and at night, calling videoconferencing would be more likely due to the availability of services at different times. What do you think? And why?'
* **Consolidation interviews** consist of the theories that are considered the most pertinent or worth pursuing being refined (Manzano, 2016). Here, questions become very structured as they are aimed at testing developed CMOCs. Examples include: 'My previous work has found that increased face to face communication in the home encourages greater trust between employees, would you agree or disagree? And why?'

**Semi-structured Interviews**

Semi-structured questions are open-ended questions that are pre-set. These enable an exploration of views, whilst remaining focussed on a specific line of inquiry (Jamshed, 2014). These were used throughout to help explore the residents' experiences of accessing healthcare and their views of satisfaction and benefits (Pritchard, 2010).

**Observation/field notes**

The researcher was unable to undertake structured observations. This was due to poor resident recruitment and limited opportunities to observe videoconferencing in use. Therefore, observation was expanded to include general field notes about the care home environment and staff interaction. Notes of possible theories on what may be influencing the use of videoconferencing were captured (Hellesø et al., 2015).

**Document review**

Additionally, it was intended that resident records would be reviewed. However, these could not be obtained, for a range of reasons. (For data collection methods, see 6.1 pp.126, 6.4 pp.139, and 6.7 pp.168).

**Readiness assessment report**

Theories were consolidated using a single text consensus-building technique (Susskind et al., 1999). This was developed in the form of a list of key recommendations that commissioners or strategic managers could use to assess a care home's readiness for videoconferencing implementation. The report was then sent out to managers from the participating care homes for feedback to help consolidate the findings further (Susskind et al., 1999). Agreement was needed to finalise the document, so this appeared to be a better fit than a conventional problem-solving technique – where all stakeholders get together to define and agree on a course of action to address the problem – as it would not have been possible to get the stakeholders together. Additionally, a visioning approach – where all stakeholders look to the future and decide what they would like to achieve with the intervention – was not used, as this project had predetermined outcomes in that it aimed to look at factors affecting uptake and sustainability.

Once the study design had been developed, the homes were recruited in the manner described below.

* 1. Recruitment process and sampling strategy

Of the 124 care homes that responded to the original survey, three were identified based on the survey results. Care homes identified as being 'at risk' by the CQC were not approached, so as to not disrupt the running of the homes or the care being given to residents (ENRICH, 2015).

Sustainability is defined as, 'the extent to which a newly implemented treatment is maintained or institutionalized within a service setting's ongoing, stable operations' (Proctor et al., 2011) (pp. 70). Adoption (otherwise known as 'uptake') is defined as, 'the intention, initial decision, or action to try or employ an innovation or evidence-based practice' (Proctor et al., 2011) (pp.69). In light of this, the variables deemed most pertinent in care home selection were how long the care home had been using videoconferencing, which identified homes using the system in a sustained way alongside the range of purposes and conditions for which it was being used. The purposes and conditions were identified by responses in the survey, and these criteria established uptake. How long the care home had been using videoconferencing for was determined by the date managers reported implementing videoconferencing on.

Maximum variation sampling was used to select the case studies that were the most different in terms of background characteristics and use of videoconferencing. This enabled the testing of a wide range of theories on what could affect the uptake and sustainability of videoconferencing (Onwuegbuzie and Leech, 2016, Better Evaluation, 2014). Maximum variation sampling helps to identify theories by allowing the researcher to compare the most varied cases to identify outcome patterns that cut across each of the variations (Palinkas et al., 2015).

Three homes were identified. The first care home was in the early stages of using videoconferencing and struggling to optimise its use (Case Study 1); the second home had integrated videoconferencing into regular practice (Case Study 2); and the third was not using videoconferencing and had no plans to implement it (Case Study 3).

Videoconferencing use was considered alongside other variables, such as scores on the English index of multiple deprivation (EIMD DECILE), rural/urban codes (RUC), local authorities (LA), and the type of home. The widest variety of cases were selected to enable an exploration of a broader range of theories; for example, all of the homes had different rural/urban code and deprivation score. Ethnic composition of the homes was taken into consideration, however all but two of the care homes had 100% White British residents. Of the homes that reported having residents of different ethnic groups, only 1% of their residents were not classed as White British (Chapter 4, pp.75).

When selecting case studies for more in-depth study, the 15 homes that stated they used videoconferencing were considered. Three of these had replied anonymously and so were not contactable, and two opted out of taking further part in the research. Additionally, one reported that their youngest resident was 27. This care home was deemed unsuitable as the study aimed to look at the use of videoconferencing in care homes for older adults. Another care home was excluded as they had not yet had the opportunity to use videoconferencing. The home had only just signed up for it, and did not want to participate further in the research.

Table Respondents who reported using videoconferencing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ID | Provider | Type | Age range | No. | LA | EIMD DECILE | RUC | Date installed | Rating VC overall | Opinion- Outcomes (<no effect excluded) | Use | Purposes and conditions used | Reason for exclusion |
| N2 | Private | Nursing | 50-100 | 46 | Bradford | 5 | A1 | 01/01/2013 | 4 | 26 | > 3 days a week | Purposes - 6 Conditions used - 7 | Was not approached as N10 accepted before and the background characteristics were too similar. |
| N8 | Private | Nursing | 52-102 | 64 | North Yorkshire | 7 | A1 | 01/02/2014 | 4 | 17 | < once a week | Purposes - 3 Conditions used - 3 | Home was limited by conditions and purposes used |
| N10 | Private | Nursing | 72-99 | 29 | North Yorkshire | 4 | E1 | 01/01/2016 | 4 | 13 | < once a week | Purposes - 3 Conditions used - 4 | N/A |
| B16 | Private | Both nursing and residential | 60-99 | 42 | Bradford | 8 | C1 | 01/02/2015 | 3 | 8 | < once a week | Purposes - 3 Conditions used - 7 | R24 had been using videoconferencing for longer and for a greater rage of purposes and in conditions. Also, the homes were too similar with regards to background characteristics |
| R24 | Private | Residential | 64-98 | 28 | Bradford | 2 | C1 | 2014 | 4 | 10 | < once a week | Purposes - 4 Conditions used - 6 | N/A |
| R25 | Private | Residential | 74-102 | 31 | Bradford | 7 | D1 | 2013 | 4 | 35 | < once a week | Purposes - 5 Conditions used - 3 | R24 used VC for a greater range of conditions & purposes |
| R46 | Private | Residential | 76-102 | 14 | Bradford | 3 | C1 | 2014 | 3 | 8 | Once a year |  | Closed |
| R53 | Voluntary/ not-for-profit | Residential | 70-102 | 23 | North Yorkshire | 7 | A1 | MISSING | 3 | 20 | < once a week | Purposes - 2 Conditions used - 2 | This home did not use VC for a broad range of purposes & conditions |
| R65 | Private | Residential | 80-98 | 32 | Bradford | 4 | D1 | 2015 | 3 | 8 | < once a week | Purposes - 4 Conditions used - 8 | This was too similar to R24 and R24 reported using the system for longer |

Recruitment was initially undertaken by approaching R46 and N10 for Case Studies 1 and 2. These care homes were deemed suitable as their background characteristics and uses of videoconferencing was entirely different. N10 reported using the system consistently, whilst R46 used it just once a year. In addition, the homes had been using videoconferencing for different amounts of time. It was considered that this would help to identify the factors that had led to sustainability. The homes were approached at the same time. N10 was then enrolled on to the study, but R46 was unable to take part due to the home closing.

This resulted in N10 being taken as Case Study 1, and R24 as Case Study 2. R24 was selected for Case Study 2, as videoconferencing was being used for a greater amount of time and for a wider range of purposes and conditions.

A third care home, with a different background and characteristics, was then approached. This home was run by a not-for-profit organisation and had a different rural/urban code to the other two cases, being located in a different part of Yorkshire and the Humber. This, combined with the home having reported in the survey the view that videoconferencing was unnecessary, and they would only install it if it were made compulsory, made it a suitable home for Case Study 3.

Table Case study 3 selection

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ID | Provider | Type | Youngest | Oldest | No. | White | Other | LA | EMID DECILE | RUC |
| R16 | Voluntary/ not-for-profit | Residential | 67 | 98 | 39 | 38 | 1 | Sheffield | 1 | B1 |

Unfortunately, no local authority care homes reported using videoconferencing, leaving this type of home untested.

The care homes identified from the survey analysis were initially approached via email. The email included a cover letter (in the main body of the e-mail), with a participant information sheet and consent form attached (the care home manager version). The manager was given 48 hours to read the information in the email, before the researcher called the home to discuss the research further. Where the care home was part of a larger provider, advice was sought on how long they would need to discuss the research with the owner, and the researcher then followed up as advised. If the home manager also owned the home, up to five attempts were made to contact the manager. The manager was given the opportunity to ask questions, and if they were interested in taking part, a meeting was then arranged at their convenience to discuss the research further (ENRICH, 2015).

* + 1. Participants

Due to time constraints for the care home, the staff, residents, and relatives were all recruited through convenience sampling (Etikan et al., 2015). However, the sampling method employed some of the principles of purposive sampling (Etikan et al., 2015). This was to ensure as broad a range of stakeholders as possible, so that the data collected enabled the exploration of a range of experiences, with participants from different backgrounds and with different ideas about what they would like from videoconferencing, for example care and nursing staff, managers, relatives and residents. This allowed the identification of cross-cutting themes and helped to establish outcome patterns

(Baker and Edwards, 2012).

This was done in an informal style. Where staff, relatives, and residents were available to take part, they were advised as to where the researcher was located in the home to discuss the research. Potential participants were given time to read the information sheet and to ask questions before formally consenting to participate in the study.

In Case Study 2, it was deemed acceptable to send letters to relatives to aid recruitment. The letters asked interested relatives to contact the researcher if they were interested in taking part (Lavrakas, 2011).

Interviews were conducted with residents, relatives, care assistants, senior carers, nurses, and deputy managers and managers of the homes. They were asked to feed back their experiences of using different care pathways with residents.

Most interviews were conducted face-to-face, but telephone interviews were also used to ensure the research fitted in with the needs of the home and to capture input from a range of stakeholders (Bryman, 2012).

* + 1. Ethical considerations

The first ethical concern addressed was that of residents with dementia. Informed consent and ethics are based on the principle that the person in question has capacity. Where the person is not deemed to have capacity, or has fluctuating capacity, they may not be able to make an informed decision as to whether or not to take part. It was believed that the research could still be effective without recruiting those without capacity (GOV., 2005), therefore care home managers were asked to provide a list of residents who they believed had capacity to understand and consent to the research. Residents deemed not to have capacity by care home staff were excluded from the research (ENRICH, 2015, GOV., 2005). In addition, the researcher assessed the resident’s capacity to consent based on their ability to understand the information provided in the information sheet and what they were consenting to in the consent form, this was done by confirming their understanding of the project through asking questions and through inviting questions from the participant (GOV., 2005). Residents who were able to understand what the project was about, could retain the information long enough to make an informed choice, weigh up the information on the benefits and risks of taking part in the research and were able to communicate their decision, they were deemed as having capacity (Dobson, 2008). Where the participant was unsure of the project, they were encouraged to take the time to speak to family members and staff before making a decision as to whether or not they would like to take part (Dobson, 2008). The researcher also assessed capacity throughout the course of the interview and where the researcher observed a decline in the resident’s ability to understand the project and their participation, the interview was terminated (GOV., 2005).

The second concern was participant confidentiality following recording and reporting of data (Brookes., 2017). To mitigate against this, all of the interviews were anonymised. All homes and participants were assigned unique participant identification numbers. Brief field notes were made anonymous (ESRC, 2017).

The third ethical concern was that of data security. To mitigate against this risk, all interviews were recorded using an encrypted recorder, and deleted once they had been saved onto an encrypted laptop. When the researcher returned to the university following data collection, it was then saved onto the secure drive, which was password-protected, and then deleted from the laptop. Transcripts were saved onto the shared drive, up until the end of the project, when all of the recordings will be deleted. The transcribed data will be kept for five years after completion of the project, when it will be destroyed (Jisc., 2017).

Ethics approval for this study was obtained from the School of Health and Related Research (ScHARR) research ethics committee.

* 1. Data Analysis
     1. Thematic Analysis

As noted by Fletcher (2017), realist ontology is designed to look for tendencies, not overarching law. These tendencies can be identified through incomplete or broken patterns in empirical data (Fletcher, 2017). Fletcher critiques the use of a grounded theory approach for realist analysis, stating that critical realism aims to find the best explanation of reality, using existing theories. However, the grounded theory approach has been used in other realist research to inductively analyse the data and gradually build higher level theories (Fletcher, 2017, Foley and Timonen, 2015). Due to the inductive approach that was initially taken towards theory development, this approach was used for Case Study 1, but later combined with deductive coding (Fletcher, 2017).The data was recoded into an existing theoretical framework that was used to identify and refine relevant theory from the data from which they derived (Fletcher, 2017).

The data from the three care homes was thematically analysed. In Case Study 1, the principles of the grounded theory approach were used to identify key concepts, relationships, and areas for theory development (Foley and Timonen, 2015). The data was coded inductively into free nodes (a list of occurring themes/key concepts that are not linked or grouped in anyway) in NViVO. The free nodes were then grouped into possible relationships, and areas for theory development were gleaned using NViVO mind maps. These were then refined and grouped into possible CMOC configurations during Case Study 2.

When analysing the data from Case Study 2, the key concepts and relationships were reformulated deductively, using the Consolidated Framework for Implementation Research (CFIR) (Appendix 8). This framework was developed to assess contextual factors in implementation research. It clearly outlines key contextual components that can influence the implementation of innovation (CFIR Research Team 2017), and thus is useful for identifying theories related to the care home context. The CFIR was used to review emerging themes and to check the findings were consistent with the established theoretical framework (Braun and Clarke, 2008).

Similar frameworks include the PARiHS framework (Promoting Action on Research Implementation in Health Services) (National Collaborating Centre for Methods and Tools, 2017) and the Alberta Context Tool (ACT) (Squires et al., 2014). Of these, the CFIR framework was utilised as it was inclusive of key components that were not considered by the PARiHS, such as communication (Goodman et al., 2017c). The ACT was excluded as it is a survey tool and consists of questions that do not easily address the data collected, and it is thus not feasible to link it to predefined questions (Goodman et al., 2017a). As the analysis was conducted, the interview guide was changed to allow the exploration of the emerging theories and to further refine and consolidate theories (Manzano, 2016).

The key relationships and concepts that were identified were then categorised into context mechanisms and outcomes, as patterns were identified in the data (Fletcher, 2017). content and patterns were developed using the guidance provided by Dalkin (2015) on how to define a mechanism (Dalkin, 2015).

* + 1. Conversation analysis

When analysing the data, the key principles of conversation analysis regarding recipient design and preferred responses were not formally recorded, but were considered when coding data. If it were believed that the interviewer had influenced the response, the data were not coded. This was to identify where interviewees may have been giving preferred responses to candidate answer questions/polar questions (questions requiring a yes/no answer). These were used as a way of testing direct theories. Preferred responses are responses given to minimise disconfirmation answers in favour of confirmation answers. For example, where the respondent has agreed with a question, but then could not expand on the answer, or paused before responding, or had weak agreements (Sidnell and Stivers, 2012). Recipient design is where a respondent bases their response on what they believe are the perspective and beliefs of the recipient (Blokpoel et al., 2012). These techniques also helped to address issues that may have arisen around confirmation bias (CDI, 2016).

* + 1. Validity and reliability

It is known that case study design has low external validity (generalizability). However, through the realist approach, the description of context helps address this problem, thus increasing external validity through its exploration of generative mechanisms of how the intervention works and the contextual influencing factors (Marchal et al., 2010).

When seeking to improve the validity and reliability of the research, key constructs were addressed, such as being transparent in the research process, improving internal validity by asking in-depth questions, gaining data from a wide range of interviewees/stakeholders, and using a comparative case study approach with maximum variation sampling (Riege, 2013, Healy and Perry, 2013).

Additionally, to ensure rigor, RAMSES reporting and quality standards were followed where possible (Projects., 2013-2017).

This chapter provided a rationale for the use of videoconferencing and discussed how it would be practically applied to data collection. The next chapter describes the three case studies undertaken and reports the findings.

Chapter 6: Results from in-depth case studies

The previous chapter described the development of a realist evaluation and the methods used for this. The following chapter feeds back the results from the in-depth case studies. The chapter is structured to give a description of the home, the use of videoconferencing, and the data collection method, before highlighting the findings.

The first home to be reported is Case Study 1, where videoconferencing was in use but faced challenges in the optimisation of its use. This is followed by Case studies 2 and 3.

* 1. Case study 1: Where videoconferencing is in use, but faced challenges in optimising the use of it.

Rationale for selection

This home was selected for an in-depth study based on the survey responses. The home rated videoconferencing as 'average' when asked about the effect of videoconferencing on outcomes. This was in contrast to the other homes that gave permission to be contacted for this phase of the study and that reported using videoconferencing. This home was also new to videoconferencing, and the service had only been in place for a few months. It also differed most strongly from the other two cases in terms of type of ownership, rural urban code, and home type. This allowed for a greater range of variables to be tested.

Description of the home

This care home is a 34-bed nursing home in East Yorkshire. It is privately funded and part of a large organisation. It is in rural urban code E1 (a rural village). It has one practising nursing staff member on duty during the day, and another on-site who is primarily the manager of the home. Three days a week, another nurse comes in to assist with administrative duties. Throughout the night, there is one member of agency nursing staff on duty. In this care home, the nurses use videoconferencing as they are considered senior members of staff. The home is split into elderly mentally impaired (EMI) and residential units.

Use of videoconferencing by the home

This home had been trialling videoconferencing from a provider since November 2015, as part of a trial by the local CCG. This meant that the hub had access to remote nurses 24 hours a day, every day of the week. The hub was accessed through software on a laptop with a video camera. At the time of this field work, the home had been using videoconferencing for 11 months and the CCG were deciding whether or not to commission the service. The CCG have since decided to withdraw the service, as the results from the trial showed an increase in the number of hospital admissions in pilot sites following introduction of videoconferencing. The CCG are currently investigating this.

Method for data collection in the home

The data collection for this home included interviews with a carer, a senior carer, three nurses, one night nurse and a manager. Three residents were identified as having capacity to participate, one was interviewed fully and another became ill during the interview. The third did not consent to take part. Field notes were also taken. Resident notes were not analysed as the care home manager later withdrew permission for access to case files.

* 1. Results

Four theory maps are presented below. These set out evidence for early development of associated theories relating to the level of expertise amongst staff, the health of the residents, managerial support, and technical equipment. These are followed by a description of the maps and examples of evidence.

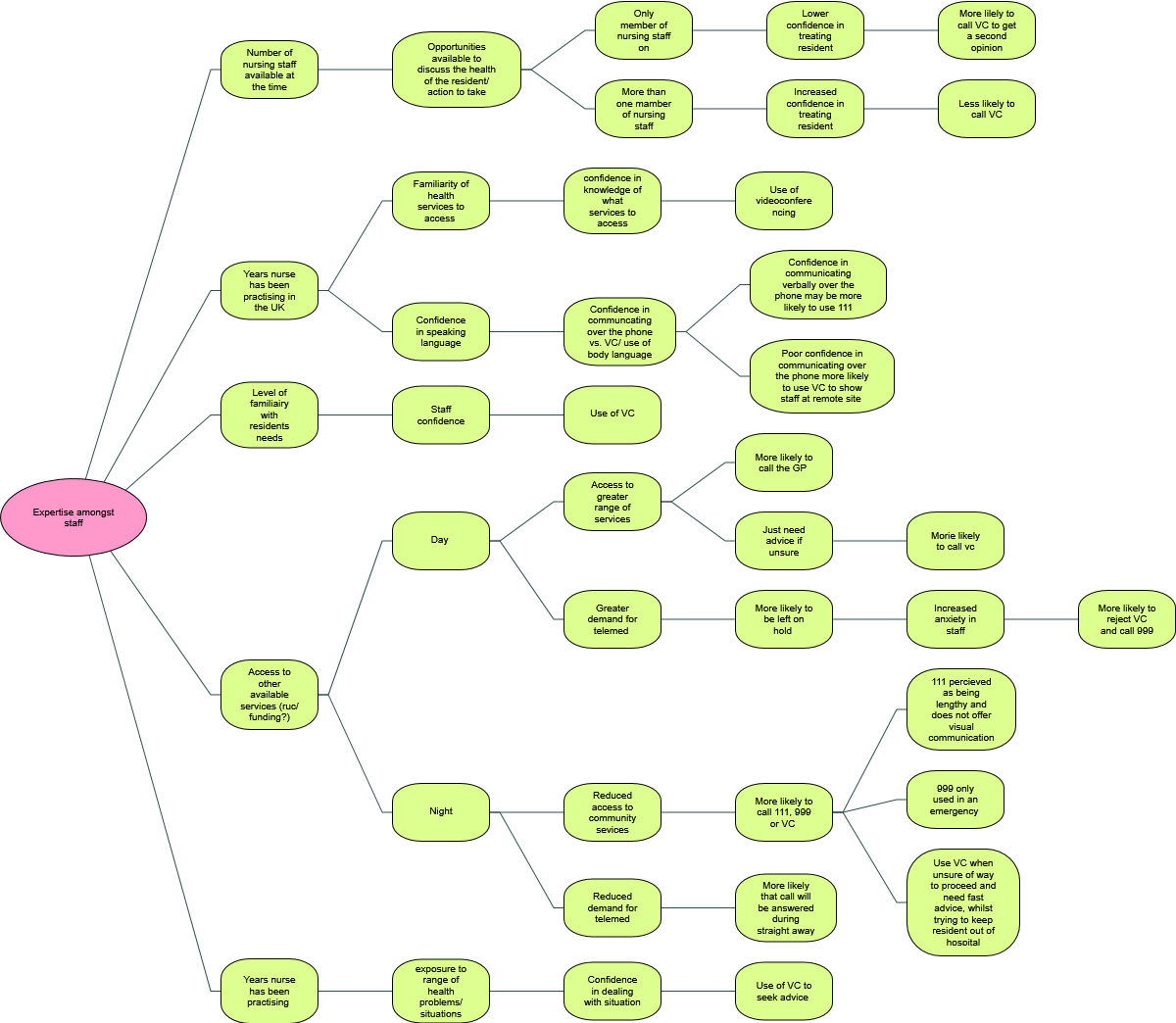
* + 1. **** **Level of expertise amongst staff**

Figure 19 NViVO mind map showing possible relationships between level of expertise amongst staff

Figure 19 shows a mind map developed in NViVO to illustrate some preliminary theories developed from the data collected. The map focusses specifically on the use of videoconferencing and expertise amongst care home staff. There were five main child nodes, as shown in Theory Map 1: number of registered nurses on duty at the time; number of years the nurse had been practising in the UK; level of familiarity with the residents; access to other available health services; and number of years the nurse had been practising in total. These will be explored in more detail below.

Respondents commented on the importance of having videoconferencing for reassurance when they were the only member of nursing staff on duty and responsible for 34 residents. Having the opportunity to discuss the situation with a nurse at the hub provided reassurance, although it did not necessarily change the treatment or outcome. It was therefore more likely that videoconferencing would be used if there was only one member of staff on duty.

*Even though we've got qualified nurses who are quite skilled and very experienced, you can't know everything, and just having somebody on the other end of the phone who's an advanced clinical practitioner who's got a lot more knowledge than what we probably have. They can give you a different perspective on it and they can give you support and guidance, and in the end, that's got to be good for the residents.* (Manager)

*Erm I think it's mostly because there's not as many nurses as we have maybe in the hospital or in surgery. You have more nurses there to help you and to give you another opinion. But in a nursing home you're working alone, or maybe for a few hours a day you are working with another nurse. So yeah, it's mostly getting a second opinion and having some help to fully understand what's going on and what you should do next.* (Night nurse)

Staff also commented on the fact that videoconferencing was used more during the night shift, and suggested a range of variables that could have been influencing this. The first was that staff at night tended to be agency staff, who were temporary and used to fill caregiving roles, and thus not as familiar with the residents as the permanent staff in the home (Castle and Engberg, 2007). Additionally, some did not have English as a first language. It was suggested that many of the agency staff working at this home had less experience in nursing than staff working during the day. One night nurse stated that she had only been qualified as a nurse for seven months, and that she lacked confidence in managing resident care due to feeling inexperienced. Additionally, there were fewer health services available at night for support and advice. This was confirmed by a member of the CCG who stated that there were gaps in the out-of-hours community nursing services provision in this area.

The first hypothesis around the increased use of videoconferencing at night was based on the discovery that night nurses tended to have less nursing experience in the UK, and English was often not their first language. This was supported by the one member of night staff who was interviewed. Respondents suggested that the nurses fitting this criterion may use the videoconferencing system more frequently so they could seek advice about correct healthcare pathways when they were not familiar with systems in the UK. Additionally, they believed that conversing with remote healthcare professionals increased the nurses' confidence, as the video link helped them to better communicate with this remote service. This was due to them being able to show the situation to the remote healthcare professional.

*If they are quite new to the home, and if they've not worked in the UK before, our systems are completely different, so it's just having somebody who knows our system and services.* (Manager)

The second area of theory development was the level of familiarity staff have with residents. It was suggested that an individual who is less likely to know the health state and associated behaviours of a particular resident would be more likely to use videoconferencing. Being familiar with a resident helped staff to identify when a resident's behaviour was not as expected. They therefore knew when to seek advice from healthcare professionals external to the home.

In one care assistant interview, the carer emphasised the importance of familiarity with residents:

Researcher: *'Do you think the level of familiarity that the staff have with the residents would impact on the use of it at all?*

Care assistant: *Yeah, because obviously the more familiar you are with the residents that we're with, you get to know them and you can pick up straight away when there's something not right… I was looking after a gentleman in York, where I met him doing home care and I was the only person they would actually allow in the house to care for him. They were a bit unsure at first, because it was another man coming into their homes, but I got them sat down, had a chat with them. I said who I am and what I do and, 'I'm not here to invade your privacy. I'm not here to belittle you in anyway, I'm just here to assist you in the best possible way I can, to make your life more comfortable'. And one morning, I think I was about 12 months into seeing him, looking after him, that was over nights, I think I was about 12 months into seeing him, and I put him in the shower in the morning and I was showering him and watching and he just had a little bit of a twitch and I turned round and said to his wife. 'Ring a paramedic.' She says, 'Why?' I said, 'It's not right, there's something wrong. That's not him, he doesn't do that'. The paramedics came out and I'd spotted a sinus bradia.*

The manager also reinforced this point:

*Sometimes, you know, we have agency nurses so they don't know our residents like we do. So, having someone give the clinical judgement helps them.* (Manager)

The third area for theory development was access to other services. Respondents reported that staff were more likely to call the GP surgery during the day, when it was open. One member of staff stated that the videoconferencing system would refer them to the GP anyway, and so calling the GP first sped up the process of obtaining treatment.

*Yeah yeah, because if we're using it thorough the day, they'd say, 'Get GP out', so we might as well just phone the GP.* (Nurse)

*Erm I think it's because during the day you have the surgery open. I think you are most prone to use the surgery line and talk to the GPs to see what they think about that situation, and if you have another nurse with you on duty, you can talk to them and discuss that case. But in the night you're on your own. You don't have the surgery open, so you have out-of-hours GP, yes, but it's easier to go through the telemedicine because you have image. You have sound and they can see more of the patient/of the resident than if you were just talking on the phone.* (Night Nurse)

Another theory gleaned from the collected data is that where members of staff had been left on hold during the day, this had left them increasingly anxious about the care of the resident. In this situation, staff had hung up and called 999 instead.

*Yeah, if it's -- well, for example, we had a lady who had a hematemesis a few weeks ago, erm and I did try -- she vomited only a small amount of fresh blood initially and she was asymptomatic at that point. So, I did try to contact them and was having trouble actually connecting to them. I think it may have been the signal, but in the end I decided to 999 her. And it was a good job I did actually, because she had a further two bleeds in the ambulance.* (Nurse)

However, staff would try to defer calling 999 in a bid to keep residents out of hospital if possible:

*At the end of the day, this is the benefit of our residents to stop them being admitted in the middle of the night. And when you're 80/90, you haven't got a clue what's going on and it's in the middle of the night, pitch black, and you don't know where you are or what's happening, and you know they may take some blood tests or an x-ray and then send you home, and you think that could have all of been avoided. Not always, but nine times out of ten.* (Manager)

However, in discussion with one of the night nurses, she said that she had never been left on hold. She believed this was due to the hub being quieter at night. This may also explain the difference in use. Additionally, respondents commented on the length of time it took to get a response from services such as 111, and claimed that videoconferencing was a faster way to access healthcare.

*Er yes I think, I was lucky I* [???] *during the night, because it was so quick their answer, but I know from colleagues that \*\*\*\*\*\*\*\* and other homes \*\*\*\*\*\*\*\*\* I know it's happened once or twice where they may be waiting for half an hour/40 minutes to get a call. So, maybe after half an hour you give up and you call the GP, or you give up and call 111. So, I think the time really* [???] *if it's an urgent situation you want them to be there just now, you know. To wait for a long time, you'll give up and try another thing, but I was lucky during the night.* (Night nurse)

*I've tended to use it sort of out-of-hours, evenings, nights, if we've got residents that have suddenly become unwell. If you need some advice or an ambulance, they can provide the ambulance if needs be, and it's just to save ringing. Sometimes if you ring the out-of-hours GP or 111 you can be talking for some time and not get anywhere, but you're better talking then with someone face to face. If you can take the laptop, they can look at the residents as well.* (Nurse)

Finally, the fourth factor was related to the amount for experience the nurse had. Respondents suggested that the less time the nurse had been practising, the fewer situations they had encountered and the less confidence they had in meeting the needs of the residents. This resulted in less experienced staff being more likely to use the system.

*Yeah, I think in the beginning you'll use it more because you are not so confident. I've just been a nurse for seven months now. I only started working as a nurse for seven months and maybe I've used it more times than the day staff nurses do because they have more experience than I do, so maybe as long. So, maybe if you get more experience, you start using it less because you are more confident in what you know and what you are going to do next, but I really think it's a big help, especially in care homes and nursing homes.* (Night nurse)

An additional area of investigation associated with Theory Map 1, which addresses access to expertise amongst staff (Theory Map 1), was whether videoconferencing was best used in rural areas. This was not treated as a key theme in this home, as the respondents did not accept its validity. However, the general observations of staff undertaking the daily running of the home were that the home appeared to be understaffed and had limited resources. There were difficulties, for example, with getting blood samples to GP surgeries when there was only one nurse in the home. Blood samples had to be received by the surgery by 10:00am, and often had to be discarded when delivered late, which occurred when there was a lack of nursing staff to cover the home. It may be that respondents did not recognise geographical distance as an issue, or this may be due to a lack of resources, as suggested. This was explored further, though no longer considered a main theme.

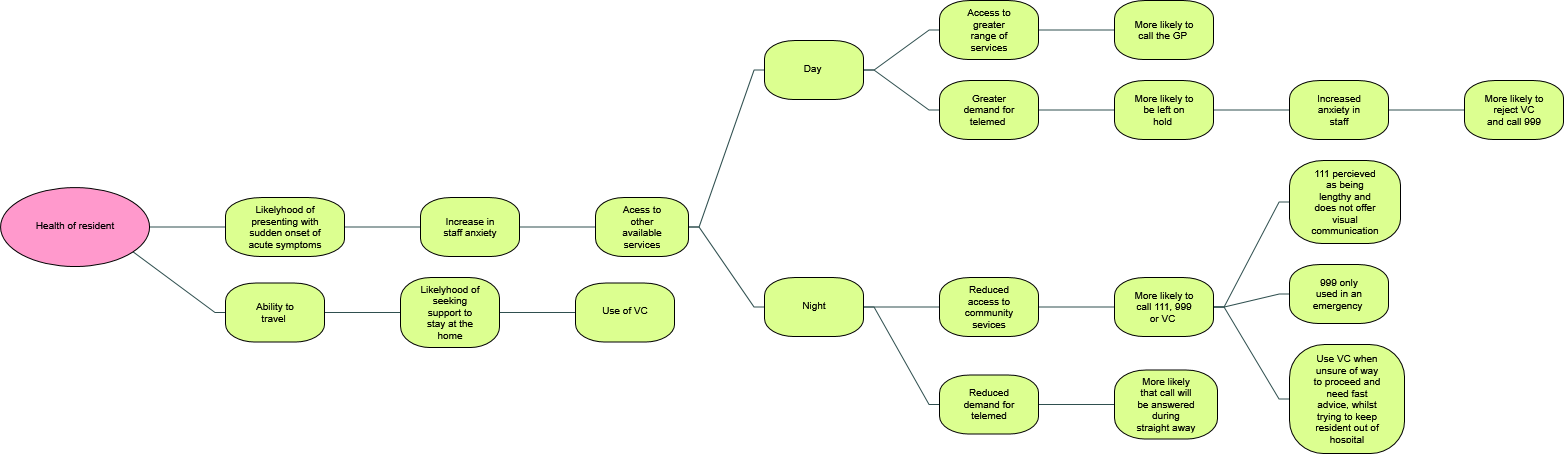
* + 1. Health of resident

Figure 20 NViVO mind map showing possible relationships between health of resident concepts

Figure 20 focusses specifically on the use of videoconferencing and expertise of the care home staff as an area for theory development. There were two main child nodes: likelihood of presenting with sudden onset of acute symptoms, and ability to travel. These are explored in more detail below.

The main finding was that videoconferencing was most likely to be used when there was a sudden onset of acute symptoms. This was due to the increasing anxiety of the staff member regarding the health of the resident. As discussed above, access to services then had an impact on the use of videoconferencing.

Additionally, one resident mentioned that they had difficulty accessing healthcare as they struggled to travel even to their local GP surgery, and noted that videoconferencing would be useful in reducing the need to travel. This was echoed by another respondent. The first resident stated that each time she went out to visit a remote healthcare professional, she came back in a poorer state of health. The resident also stated that a lack of resources in the home made it difficult for them to travel due to the time it took staff to get them ready and the availability of staff to escort them. However, the service she required was not provided by Airedale – this service being a specialist surgeon to assess the potential for surgery on a broken shoulder blade. The resident also had problems getting to the dentist. They needed to be seen at the surgery as they required treatment with specialist equipment that was not portable. As the resident could not travel, this meant they had ongoing problems with their teeth. For reducing travel, both residents thought it would be a good idea.

*Eh doctors come in and chiropodists and, sort of, I've only got five teeth left at the bottom breaking away, but because they want me to get dressed and go in a wheelchair in an ambulance, which is half way up \*\*\*\*\* -- I have to get my own arrangements to get there and then I have to get the ambulance to bring me back or somebody so that's a bit… I'm stuck*… *I'll just have to wait, you see, there are three nurses and I presume that in the daytime -- well, I presume that the manager will be down in her office sometimes, but most of them will be in charge and if I want anything I have a buzzer, a red thing, somewhere… They'll come when they can. So, this business of having to get transport to go anywhere, it's just not on. I just don't feel it's worthwhile because I come back worse than when I go, and besides it causes a lot of -- well, they have to come and dress me or put me in a clean nighty with a cardigan or something on to go out. So, I'm just sitting here waiting. I don't know what I'm waiting for really.* (Resident)

When asked about travel, the resident followed up by saying:

*Erm it upsets me. It makes me a bit nervous, but I've been down to London twice, but I went in the back of an ambulance and went backwards all the way to London. The second one just about did me, and I've actually deteriorated since then.* (Resident)

Keeping residents out of hospital was a driver that encouraged staff to use the system:

*At the end of the day, this is the benefit of our residents to stop them being admitted in the middle of the night. And when you're 80 90, you haven't got a clue what's going on and it's in the middle of the night, pitch black, and you don't know where you are or what's happening, and you know they may take some blood tests or an x-ray and then send you home. And you think that could have all of been avoided. Not always, but nine times out of ten.* (Manager)

* + 1. Managerial support

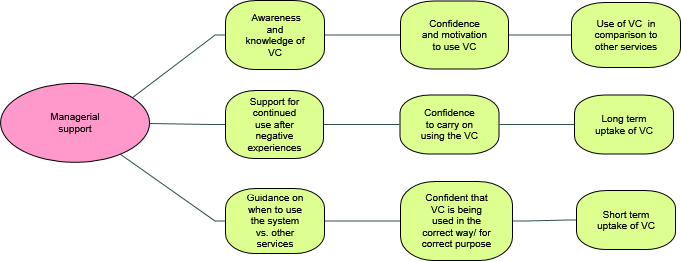


Figure 21 NViVO mind map showing possible relationships between managerial support concepts

Figure 21 focusses specifically on managerial support. There were three main child nodes: awareness and knowledge of videoconferencing, support for continued use after negative experiences, and guidance on when to use videoconferencing versus other services. This are explored in more detail below.

Although managerial support was not raised as often as other factors, all those who did mention it stated that the managerial support for the system had been key to the successful uptake and sustainability of the service.

*I think when I started she was the first one to tell me how the videoconferencing worked, what I needed to do, and what is it for. And whenever we have something in the end or discussing something, she's the first one to tell us, maybe we should go to telemedicine and get another opinion. Then we can all see what we should do. But yeah, she encourages us to use the telemedicine.* (Night Nurse)

*Well, we try in this care home because* [the manager] *is quite keen we do try to use the telemedicine before we use 111. That's what we've tried to do and it's worked out quite well really.* (Nurse)

Upon further discussion with a member of the CCG, they also said that they had found managerial support to be key in raising awareness of the system, supporting staff through negative experiences with the system, and providing guidance on how and when to use it. Their view was that this improved staff confidence and motivation in the short- and long-term. This theme was explored with more relevant questions in the next case study.

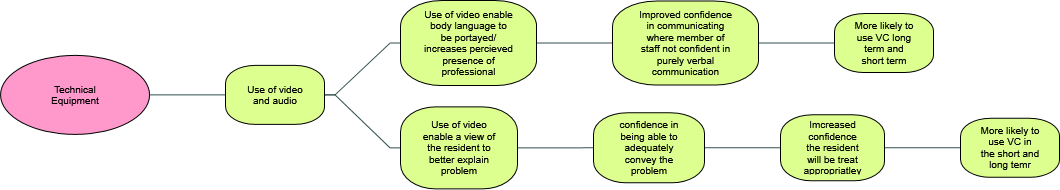
* + 1. Technical equipment

Figure 22 NViVO mind map showing possible relationships between technical equipment concepts

Figure 22 focusses on technical equipment. There was one child node: the use of video and audio. This are explored below.

This area of theory development suggests that the use of video contributes to the increased use of videoconferencing as a way of improving access to healthcare. This was thought to be down the video capability enabling staff to better communicate with the remote site as they could show the professional the problem. This was considered particularly pertinent where the nurse's first language was not English. Respondents also considered it to be easier to explain the problem to the member of staff at the remote site when video was available. This could be due to their perceived presence, as body language could also contribute to communication (Sävenstedt et al., 2004). Both of these factors were seen to increase the use of videoconferencing, in favour of services that were purely audio, such as 111. It appeared that this method of accessing healthcare increased staff confidence around meeting the residents' needs.

*Er I would have to call 111 because surgeries are not available during the night, or if the patients are registered with \*Polcol I could call the Polcol line. But some of the patients are not registered with Polcol so it's easier for us to go with the telemedicine, because it's easier to show them what we are seeing rather than to explain through the phone, because they can see what you're seeing. I think it's easier for us and for them, to give us an opinion or to help us to manage that situation.* (Night nurse)

\* An ICT service linked to a local hospice for support and advice.

*Because sometimes when they get through to them, they can actually see the patient. They can actually see the patient, see what they look like and the symptoms when they actually get through. And they actually say, 'Yeah you need to get them straight 999', or, 'You need to contact the GP', do you know what I mean?* (Senior carer)

* 1. Summary

The main driver for the use of videoconferencing appeared to be access to expertise, along with resident health and managerial support. These were therefore tested further in Case Study 2. Additionally, more in-depth theories were developed to explain how the use of videoconferencing varies between residential and nursing homes to meet the different healthcare needs of the respective residents.

Case Study 2 concerns a residential home with no on-site nursing staff. This allowed for staff mix to be explored in more detail, as well as resident health. Managerial support and the impact this has on the uptake and sustainability of videoconferencing were also explored, as these were identified as themes towards the end of the Case Study 1 data collection process. A member of the CCG from the area believed it to be the most important factor in uptake/use by a CCG running a pilot in that area.

The next case study did not ask questions specifically about geographical access. However, the site has a different rural/urban code, and so variations in approach could have still been identified if necessary. Nearly all participants in the first case study claimed this was not a significant issue. Respondents acknowledged that it may be more expensive to send services to this home than to those in urban settings, but overall they did not think this would affect uptake of videoconferencing. However, as the residents mentioned that they were not able to access local services due to poor mobility, this was explored further in the theme category of 'resident health'.

Case Study 1 aimed to identify and glean possible theories of influences on uptake and sustainability of videoconferencing. The following case study further refined the findings from the previous case study.

* 1. Case Study 2: A home where videoconferencing is well-integrated into routine care, and use has been sustained for approximately three years

Rationale for selection

This home was selected because the survey returned by the manager reported overall satisfaction with videoconferencing as 'high'. The manager also the highest rating for videoconferencing's impact on outcomes of all the homes that had said they would be happy to participate further in the study. It was also the most different to the other two cases in terms of ownership, rural urban code, and home type. This allowed for a greater range of variables to be tested.

**Description of the home**

This care home was a 28-bed residential home in West Yorkshire. It was a privately-run business, in rural code D1 (a rural town fringe). It had no practising nurses on-site, but had weekly visits from the district nurse and had access to a nursing service which could be contacted during and an out-of-hours service every day of the week.

The senior members of staff were senior carers, deputy managers, and the manager/owner. At night, there were two care assistants, or one senior care assistant and one care assistant. There was also a deputy manager or the manager on call to deal with situations arising during the night.

**Use of videoconferencing by the home**

This home had been using videoconferencing since 2014, and had been initially approached by a member of staff from a videoconferencing provider in the area (the same provider described in Case Study 1) to see if they would like to trial videoconferencing, as described in Case Study 1. Two senior members of staff then completed the training and the system was implemented into the home.

**Method of data collection in the home**

Data collection involved interviews with the manager/owner, one deputy manager, four senior care assistants, two day care assistants, one night care assistant, two relatives, and one resident. Field notes were taken, but the resident's records could not be obtained due to time constraints.

As new theories were gleaned within this home, follow-up interviews were conducted as part of Case Study 2 to address new findings and inform the development of the theories.

The findings have been reported in line with the Consolidated Framework for Implementation Research (CFIR). The CFIR is composed of five overarching constructs: intervention characteristics, outer setting, inner setting, individual characteristics, and process (6.5.1, and Appendix 8) (CFIR Research Team 2017).

* 1. Results
     1. Intervention characteristics

Intervention characteristics is composed of eight sub-categories: intervention source, evidence strength and quality, relative advantage, adaptability, trialability, complexity, design quality, and packaging and cost. However, for this case study, only relative advantage was identified as an area for further theory development, with early CMOCs being presented below. The exclusion of the other categories will be justified in the consolidated Case Study 3 findings.

**Relative advantage**

Relative advantage was seen to work in two ways. The first was being able to observe the effect of visually showing the remote healthcare professional the situation. The second was the staff being able to observe the relative advantage of the service over other services in relation to the speed of access to healthcare. The CMOCs for these are:

Table Breakdown of emergent theories linked to speed of response of services

|  |  |
| --- | --- |
| **Intervention characteristics: relative advantage** | |
| **'Faster response supports uptake'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides quick access to healthcare expertise. In contexts where staff members recognise the need for residents to be seen quickly, staff are more likely to want to reduce the resident discomfort as soon as possible |
| **Explained (outcome (s))** | This makes it likely that videoconferencing will be used to access healthcare advice and services. Staff being able to see the difference in speed compared to other services will result in them being more likely to reaffirm their commitment to using it. As they use it more, the perceived ease of use will increase as they become familiar with the system. This may result in it being used more, and so the uptake and sustainability of videoconferencing is increased. |
| **Example of evidence** | *It's bringing up things that we potentially might not have spotted straight away, because of ringing to say, 'Look, can we hub it?' Things are getting sorted much quicker so therefore they're getting noticed quicker, like chest infections are getting found quicker so not having as much impact on the resident. They're dealt with quicker.* (Senior carer)  *Yeah, I mean the speed of access is pretty good on the hub. You know getting through to* [inaudible] *we very rarely had to wait up to 40 minutes, but that's only occasionally. Usually speed of access is excellent and they are very good at making just a very quick decision.* (Manager)  *It's how we recognise it as what happens in practice. You know they seem to come up with a solution and sometimes they'll say ring a GP or they'll ring a GP direct, and if that happens they tend to come out quicker.* (Manager) |

Table Breakdown of emergent theory linked to confidence and communication

|  |  |
| --- | --- |
| **Intervention characteristics: relative advantage** | |
| **'Low confidence in communication encourages uptake'** | |
| **Explanatory (context and mechanism)** | Videoconferencing allows for the patient to be seen through audio-visual technology. In contexts where staff are not confident about their ability to convey the situation to a remote member of staff using purely audio technology, staff are more likely to want to be able to show the situation to the remote member of staff, making it more likely that videoconferencing will be used to help convey the situation and seek advice. |
| **Explained (outcome (s))** | This would result in more residents having a quicker and more accurate diagnosis than would be obtained from purely audio technology. This in turn makes it more likely that more appropriate treatment would be received, resulting in improved resident wellbeing and health long-term. As a consequence, the use of videoconferencing would further increase, thus benefiting uptake and sustainability. |
| **Example of evidence** | *I think staff felt more supported with it because you're looking at someone and they're obviously giving you advice and that back, and they were giving you advice and that to follow, and you could actually see someone, which helps* (Senior carer)  *Yeah, they just ask you certain questions on 111 and it's just like, 'Are they breathing?' 'Well, yeah, they're breathing, because otherwise I would have called 999'. Do you know what I mean? They go like on and on, but they can't actually assess the situation because they're not in front of it.* (Senior carer)  *Yeah yeah, because instead of having to go to Airedale, once they're in A&E and they've done the triage, then they tend to keep you there for a day, don't they? If they do the triage when they're in home in bed, then they don't necessarily need to send them in. Plus, 111, like I say, they send an ambulance for stubbing your toe on the corner of a Zimmerframe. So, if they take them there, they keep them there, don't they.* (Senior carer)  Researcher: *And have you noticed any other differences, such as admission rates?*  Deputy Manager: *Yeah, probably a slight improvement with that. Yeah, because I probably think that on some occasions when they take them down to get them checked out, when they've said on the hub, just give them paracetamol and we'll get the doctor out in the morning. So, yeah.*  Researcher: *Would you prefer to be treated here then?*  Resident: *I'd prefer to be treated here, yeah.*..*Well I've more faith in them here, than hospital. More faith. More faith here, than in hospital.* |

* + 1. Outer Setting

'Outer setting' consists of four subcategories: patient needs and resources, cosmopolitanism, peer pressure, and external policies and initiatives. However, only cosmopolitanism was identified as pertinent to this case study, with early CMOCs being developed and presented below. All excluded categories will be further justified in the section on the Case Study 3 findings (6.8).

**Cosmopolitanism**

Upon applying the CFIR framework to Case Study 1 (the previous case study), and comparing the findings, the relationship with the remote site emerged as a possible theory.

Table Breakdown of emergent theory linked to affecting use

|  |  |
| --- | --- |
| **Outer setting: cosmopolitanism** | |
| **'Unequal relationships hinder use'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides remote access to healthcare. In contexts where staff feel inferior to the staff answering at the remote site, staff may be less likely to call until they have made every effort to treat the resident using support within the home. However, where they consider themselves equal partners, and they are working alone, it may help reduce the feeling of professional isolation. |
| **Explained (outcome (s))** | If staff feel like unequal partners, the resident is more likely to be in need of more urgent help by the time they approach telemedicine. This makes it more likely that they will need a speedy response, and if the hub does not respond quickly confidence in the system may be lost. This uptake and sustainability of videoconferencing would be thus reduced. However, when they feel like equal partners, nursing staff may be more willing to call and ask for advice, increasing uptake and sustainability. |
| **Example of evidence** | Researcher (Case Study 1): *And what's the relationship like between this site and the remote site?*  Nurse (Case Study 1): *Well I don't think it's* [???] *I think historically people look and think: oh it's care home, so… I think historically they think that the nurses in care homes are not second rate, but that they are not as experienced, but we can hold us own. If anyone says anything to us, we can answer back. And it's like my colleague \*\*\* worked 30 years on the same surgical ward. So, it's not that we've been a -- I've been a ward sister. So, it's not that we've not got the experience. I just think historically people think: oh they're working in care homes, they haven't got the same skills. But that's not right, you know, because we have. If anything, we are more generalised than what they are in the hospitals, so. But if we're not happy, we just tell them.*  (Case Study 1): *I was just saying though, I don't know anyone, not round here. I don't know how big you have to be before you get two nurses, because with you having* [???] *on the dementia side who's not general trained, and here's thinking do you get that support? Because you're trained differently, aren't you? I'm not mocking you, you know what I mean?* (Nurse)  (Case Study 1): *We're not proper nurses.* (Nurse 2)  (Case Study 1): *Erm I think it's mostly because there's not as many nurses as we have maybe in the hospital or in surgery. You have more nurses there to help you and to give you another opinion. But in a nursing home, you're working alone, or maybe for a few hours a day you're working with another nurse. So yeah, it's mostly getting a second opinion and having some help to fully understand what's going on and what you should do next.* (Night nurse) |

Table Breakdown of emergent theory linked to psychological safety

|  |  |
| --- | --- |
| **Outer setting: cosmopolitanism** | |
| **'Psychological safety supports use'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides remote access to healthcare. In contexts where staff feel they have greater psychological safety when using videoconferencing than alternative services, staff may be more likely to favour calling the hub over other services. |
| **Explained (outcome (s))** | This makes it more likely that the hub will be used more frequently and that staff confidence when accessing remote support for residents will improve. This will lead to improvements in the health and wellbeing of the residents. This will in turn improve the uptake and sustainability of videoconferencing. |
| **Example of evidence** | (Case Study 2): *The on-call will always come and take them to hospital because there's only two night staff. Yeah, we don't want to ring up and say -- I mean because we've had a couple of times with doctors, not hub doctors, but they've come out and said, 'Well, this could have waited until tomorrow', and it can knock your professional confidence really, because if you felt they needed it there and then and someone else is saying, 'No, this could have waited', you don't want to be making that decision again. I'd always ring the doctor or hub it there and then, because I know how long it can take for them to come out and you don't want to run the risk of it getting worse, do you?* (Senior carer)  (Case Study 2): *Yeah, you know, I think they enjoy it because it's (a) because the night staff use it and they're, you know -- they're not even seniors so… you know. So, you know, it's a confidence boost and it's -- they're making decisions, connecting with clinicians directly.* (Manager)  Researcher (Case Study 2): *What do you think it is that's helped improve the staff confidence with it?*  Deputy manager (Case Study 2): *I think it's because they know there's a nurse or somebody at the other end who obviously knows more than they do and it's that third-party really.* |

* + 1. Inner setting characteristics

Inner setting characteristics consist of the following constructs: structural characteristics; networks and communications; culture; implementation climate (further divided into: tension for change, compatibility, relative priority, organisational incentives and rewards, goals and feedback, and learning climate); and readiness for implementation (further divided into leadership engagement, available resources, access to knowledge, and information). In this section, structural characteristics, tension for change, and learning climate emerged as pertinent to the early CMOCs developed. All of the exclusions of categories will be justified in Case Study 3.

**Structural characteristics**

The fact that the home was small, had strong team stability, and had a high ratio of senior members of staff, meant that care assistants had the support they needed. This helped with disseminating information and offering practical support on the care home floor. The CMOCs related to this are as follows.

Table Breakdown of emergent theory linked to team stability

|  |  |
| --- | --- |
| **Inner setting characteristics: structural characteristics** | |
| **'Team stability supports psychological safety'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides a new and innovative way of delivering healthcare. In contexts where there is strong team stability and low turnover, members are more likely to feel increased psychological safety. |
| **Explained (outcome (s))** | This makes it more likely that they will feel able to try new methods, making it more likely that they will trial videoconferencing and build up their experience. This will build up their self-efficacy in using the system, helping them reaffirm their commitment to videoconferencing. Upon seeing benefits to use of videoconferencing, the member of staff is then likely to become an advocate for the system and promote the use of it to others. This will in turn increase the uptake of videoconferencing and make it more sustainable. |
| **Example of evidence** | *I think that would be a case of whether they rung on-call first, erm… And then they'd explain because no one on-call has been here under -- well, my mum does it, and she's been here 20 years. \*\*\*\*\* does it and, well, he owns the place. He's grown up here when his dad had it. \*\*\*\*\* she does on-call. She's been here over 20 years. And I do it occasionally and I've been here seven. So, everyone that does on-call knows the residents inside out. They know their behaviour patterns.* (Senior carer)  *Erm we provide a homely atmosphere. We're not regimented and we have a lot of staff on to spend time with the residents, which I think contributes to their quality of work as well as the resident's quality of life. And because we're a small home, they can form proper relationships with the residents, you know. They get to know them. They regard them as friends and it becomes important to them.* (Manager)  *I've worked here seven years and I started off in laundry as a carer, and not long after I started as a senior carer.* (Senior carer) |

Table Breakdown of emergent theory linked to organisation size

|  |  |
| --- | --- |
| **Inner setting characteristics: structural characteristics** | |
| **'Size supports dissemination of information'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provide a new method of healthcare delivery that requires training. In contexts where there is a high ratio of senior members of staff to care assistants and the home is small, peer and managerial influence, and information about the innovation, is more likely to be spread. |
| **Explained (outcome (s))** | This helps to disseminate support for the use of videoconferencing, which leads to greater and more widely spread uptake amongst staff. |
| **Example of evidence** | Researcher: *Because you seem to have quite a high ratio of deputy manager and managers to staff as well.*  Manager: *We do, yeah.*  Researcher*: And I just wondered, how do you think that kind of structure has influenced the use of videoconferencing? Do you think it's influenced it at all?*  Manager: *Yeah, I mean I think information's passed on quicker. I think staff know what to do more quickly in terms of care, in terms of policies and procedures, you know. It doesn't have to go through tiers of management, it's just delivered at the handover by the senior care/deputy mangers/me.*  *They've got a good management staff, you know, senior level. You know, I think there's four of them at that senior level and I think they're always there and they always know. In fact all the staff seem to know a lot about everybody, you know, which is good.* (Relative)  *And because we're a small home, they can form proper relationships with the residents, you know. They get to know them. They regard them as friends and it becomes important to them.* (Manager)  (See evidence for 'Culture' CMOCs) |

Exploration of knowledge and beliefs about the intervention revealed that the previous home (Case Study 1) was less likely to wait for a response from the hub. This is in contrast to this case study, where staff were more likely to wait for a response for longer periods of time. An explanation for this is given in the CMOCs below.

Table Breakdown of emergent theory linked to untrained carers

|  |  |
| --- | --- |
| **Inner setting characteristics: structural characteristics** | |
| **'Untrained carers support use'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides remote access to healthcare. In contexts where staff have a reduced ability to make decisions about resident care, they are more likely use videoconferencing frequently to seek reassurance from external staff about resident health. |
| **Explained (outcome (s))** | The staff in these contexts are therefore more likely to call in situations that are less urgent, making it more likely that they will be willing to stay on hold longer before approaching the GP or calling 999 to get a speedier response. This means that the use of videoconferencing may be used more frequently to seek advice and support. This may then increase the uptake and sustainability of videoconferencing. |
| **Example of evidence** | *Erm no, it's more if it's a minor thing – can it wait until the morning? Do we need to be making this call? Erm do you know what I mean? Something like that. Something like that really, I suppose, but we always say better to be safe than sorry. We always err on the side of caution.* (Manager)  *Erm the senior member of staff had a needle stick injury and the senior member of staff wanted a bit of advice on whether or not to go down to the hospital and see if she needed any blood tests or any medication, because the lady who she was tending to she was diabetic and she was having her diabetic injection at the time. And then whilst the senior member of staff was dealing with the insulin injection, she accidentally pricked herself. As I was there at the time observing, she wanted me to assist her in using the videoconferencing to contact the nurses at Airedale hospital, just to see if she needed any medical attention. (*Care assistant)  *Originally, when we first got it, it was more just a night thing, but as we've used it more we've found that we can really use it for anything. It is a lot more convenient and it's a lot better for the residents than ringing 111, so for the same situation I've used both and the hubs just worked. And it's been over and done with in under two hours, and I've been waiting ten for another.* (Senior carer) |

Table shows a breakdown of emergent theory linked to medical training

|  |  |
| --- | --- |
| **Inner setting characteristics: Structural Characteristics** | |
| **‘Medical training hinders use’** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides remote access to healthcare. In contexts where staff have more medical training, it is likely that they will be able to deal with more minor ailments amongst the care home team and using the current services. |
| **Explained (outcome(s))** | This means that they are more likely to use videoconferencing only in more urgent situations, to try and prevent a resident going into hospital. These situations will necessitate speedier responses, and where the hub does not respond quickly confidence in the system may be lost. This means that uptake and sustainability of videoconferencing will be reduced. |
| **Example of evidence** | (Case Study 2): *Unless someone's deteriorated in the period they're on hold, but you know I can't see a connection between calling the hub, which would be possibly something you would want advice for and A&E and 999, which is an emergency call for somebody who's having a cardiac arrest. So, I can't see that connection… Because if someone's 999, to me, they're quite critical. Unless they've developed that critical illness in the 45 minutes since they started contacting the hub then they shouldn't have been contacting the hub in the first place. Do you see what I mean? If we thought somebody was having a stroke or a heart attack or something, we'd just contact 999 because usually the paramedics come out first anyway. They're pretty good. They're here within 5-10 minutes and then the ambulance tends to arrive later. The paramedics come out and treat them, and see what's what. So, it's very rarely we'd do 999.* (Manager)  (Case Study 2): *Erm if the family were worried, if it was their mum or their dad or whatever, if the family was worried and if they felt comfortable with us doing so, then I would use it in that situation. Because as I was explaining to you before, the lady with her back, the family was there and obviously carers who were on the shift spoke to the senior and asked advice from a senior member of staff. And then the senior member of staff then had a chat with the lady's family and asked what would be best, and what they felt comfortable doing and whatever, yeah. So, obviously if you've got consent from the person who needs the attention and family consent, then I don't see why it should be a problem.* (Care assistant)  (Case Study 1): *As far as I know it's all right, yeah, but like I say, I've never used it. I've only been here like five months, and the only time I've had an emergency is when I've had to 999 it. So, I wouldn't have used it for that anyway because I thought he was having a heart attack.* (Nurse)  (Case Study 1): *One of the residents was becoming unresponsive. His pulse and BP and everything had dropped. So, I thought: oh phone them. But I couldn't get through so I ended up phoning the ambulance anyway.* (Nurse)  Researcher (Case Study 1): *How long were you on hold for?*  Nurse (Case Study 1): *About five minutes, which is a long time when you've got somebody not well.* |

**Culture**

This home has a very complex culture, as a lot of the staff are related. It is family-run, and even those not related appeared to enjoy close working relationships with the other staff. The leadership of the home has enabled a working culture in which all staff reported high job satisfaction. Many had worked at the home for years, and the home reported having used agency staff only twice in the last 20 years. Relevant CMOCs are presented below.

Table shows a breakdown of emergent theory linked to culture

|  |  |
| --- | --- |
| **Inner setting characteristics: culture** | |
| **‘Culture supports commitment and self-efficacy’** | |
| **Explanatory (context and mechanism)** | Videoconferencing is a new method of healthcare provision, and it requires training and support. In contexts where a manager has been in the role for a long time, and has a high level of autonomy in meeting the home's demands, in a positive culture, employees will have a higher rate of job satisfaction and stronger identification with the organisation. In this context, a care home culture will develop in which employees work together effectively to improve the performance of the home. |
| **Explained (outcome(s))** | This results in staff becoming more committed to developing their self-efficacy in using the system, and thus using it more and developing their experience. As they see the benefits of using the system reiterated, their self-efficacy develops and they will become an advocate for the system, strengthening their commitment to making videoconferencing work. This will in the staff member teaching others, leading them through the same process and making the adoption of videoconferencing more sustainable. |
| **Example of evidence** | *Erm we provide a homely atmosphere. We're not regimented and we have a lot of staff on to spend time with the residents, which I think contributes to their quality of work, as well as the resident's quality of life.* (Manager)  *Not at all. I think in the 20 years I've been here, we've used them* [agency staff] *twice. There's normally someone who covers or* [???] *off to do it. If it's not myself, it's one of the other carers.* (Deputy manager)  *The owners are there all the time, and their father ran it beforehand. So, it's been going for a long time as a family business and they have a great sense of pride in it. And both deputy managers have both* [inaudible] *as well, and they get on and, I don't know, they seem to manage to keep staff happy. They just manage to keep the staff and there's just a general atmosphere of kindness. I don't know where that comes from.* (Relative)  *Erm you have support there. If you're stuck, you can always ask… I've just had support. Support is key, because you know if you're not confident in using something it's quite terrifying, to be honest. You don't know whether you're coming or going or whatever, yeah.* (Care assistant)  *It's* *how we recognise it as what happens in practice. You know, they seem to come up with a solution and sometimes they'll say, 'Ring a GP', or they'll ring a GP direct, and if that happens they tend to come out quicker.* (Manager)  Researcher: *With a more confident and competent member of staff in using it, I just wondered whether or not you think they would be more likely to advocate and promote the use of it as opposed to less senior members of staff maybe?*  Manager: *I think they probably would, if I'm honest. I'm not entirely sure it should, but I think it probably would.*  *Yeah, it works better that way because you don't want to let each other down if you're related to each other or you know each other, and so you're not likely to not show up or only say you can do certain shifts and not cover each other.* (Senior carer)  (See evidence for 'Culture' CMOCs) |

Table shows a breakdown of emergent theory linked to communication culture

|  |  |
| --- | --- |
| **Inner setting characteristics: culture** | |
| **'Communication culture encourages trust'** | |
| **Explanatory (context and mechanism)** | Videoconferencing is a new method of healthcare delivery that requires commitment from the care home staff in optimising its use to ensure optimal benefit for staff and residents. In contexts where leadership style and culture are effective in promoting a strong communication culture, trust and commitment to the organisation are likely to be increased. |
| **Explained (outcome(s))** | Increased amounts of trust lead to greater commitment to the care home, making staff more proactive in helping the care home achieve its goals. As a result, they are more likely to be committed to effectively implementing videoconferencing and supporting one another in using it, if they see this as a means of increasing the quality of care they provide. This means that staff gain more experience, and formal or informal training, making it more likely it will be used in daily care. |
| **Example of evidence** | Researcher: *And the other two homes I've been to have relied heavily on agency staff, particularly at night.*  Manager: *No, we never.*  Researcher: *Yeah, I was just wondering, how have you managed to retain staff during the night?*  Manager: *Erm, by treating them well, truthfully, because it's not the best job in the world. So, it's about treating them with respect and listening to what they have to say and not thinking you know better when you don't do nights. You know, I tend to take on board what the night staff say because they're the ones there. I'm not doing nights. I've done nights occasionally, but not very often.*  Researcher: *Is there any kind of pay difference between the night staff and the day staff?*  Manager: *We don't actually, no. I know some homes do, but we don't have a pay difference, no.*  Researcher: *Oh that's interesting because other homes thought it might be down to it not being paid enough. They said they thought they didn't pay them enough for the antisocial hours, so I just wondered how you did it.*  Manager: *I think you've just got to provide a good working environment.*  (See evidence for 'Culture' CMOCs) |

**Tension for change**

Here, the home reported dissatisfaction with alternative services prior to videoconferencing implementation. This may be one factor that helped to reduce barriers to implementation. The CMOC identified for 'tension for change' is as follows.

Table shows a breakdown of emergent theory linked to tension for change

|  |  |
| --- | --- |
| **Inner setting characteristics: implementation climate** | |
| **'Tension for change supports uptake'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides a new and innovative method of delivering healthcare. In contexts where there is a low opinion of alternative services, and strong communication links, staff are more likely to seek to avoid the problems of alternative services, and dissatisfaction with the current status quo may build. This will create a more homogenous environment (whereby the organisation has a shared view and sense of purpose), in which there is general dissatisfaction amongst staff members. |
| **Explained (outcome(s))** | This makes it more likely that staff will use the hub, where they are able to speak to a nurse and quickly explain the problem, thus speeding up the process of accessing appropriate health support. This is likely to increase staff commitment to using the tool. Where there are strong communication links in the team, this will help to build dissatisfaction with the current status quo and increase support for videoconferencing, as residents will be treated more appropriately in the home. This will result in reduced resistance to change, making it more likely that videoconferencing will be widely adopted, thus in the long-term improving access to healthcare for residents. |
| **Example of evidence** | *111 are \*\*\*\*. You've just got to wait for hours. They ring you back -- they'll ring you back within the hour. Erm we try -- if someone's not looking 100% on a Friday, we try to get our doctor out before weekend, because if we've got to see the doctor on the weekend you can be waiting 6-8 hours. We'd rather hub it than ring 111. We avoid it like the plague.* (Deputy manager)  *Speed of access, plus the fact it's got manned clinicians. 111's not manned by clinicians. It's manned by people who are asking you 100 questions and sometimes I feel the* [inaudible] *send people to A&E unnecessarily. It's not a criticism, I think it's a system under pressure. I don't think there's enough GPs under the 111 system.* (Manager)  Researcher: *So, I was just trying to see if being able to compare videoconferencing helped build up the dissatisfaction, or if it was there before.*  Manager: *I think it was there before, to be brutally honest. You know the out-of-hours service has not worked properly since GPs renegotiated their own contract. What was that, seven or eight years ago? You know, because before local surgeries used to cover, you know, local GPs, but then they were allowed to contract out of doing weekend work and it went to locum doctors. And ever since then, the service has not been as good, I don't think. I think it was back in 2008 actually, when they renegotiated the contract.*  Researcher: *Have you ever been left on hold for long periods of time?*  Senior carer: *Yeah, I have, once. For an hour and 25 minutes. But to be fair, that's nothing in comparison to the times we've had to wait for other stuff.*  Researcher: *What other stuff do you mean?*  Senior carer: *I once waited for an ambulance to come from next door. It was 10 hours and 50-something minutes. This was with call backs, ringing back saying, 'Look, it would be quicker for me to just pick her up and carry her. I could just carry her across the car park and we would be there', but because it was a broken hip so…* |

**Learning climate**

When considering the learning climate and readiness for change, the home fostered a high level of psychological safety and staff members appeared to feel valued. Staff members supported each other regardless of rank, and covered each other's jobs if needed. This led to the slack in resources and team work required to undertake training in the new intervention. The CMOCs are as follows.

Table shows a breakdown of emergent theory linked to effective recruitment of staff

|  |  |
| --- | --- |
| **Inner setting characteristics: learning climate** | |
| **'Effective recruitment of staff, results in employees feeling valued'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides a new method of healthcare provision, in which staff could potentially lack confidence. In contexts where there are strong social links and the home is adequately/over-staffed, staff feel valued as a result of being given equal opportunities to learn in the home. This promotes an environment of shared learning, as members support each other emotionally, covering each other's jobs, and creating sufficient time to pursue training and for managers to undertake effective recruitment of committed staff. |
| **Explained (outcome(s))** | This provides the space and time for staff to learn how to use videoconferencing, which will increase its use amongst staff. This makes it more likely that they will feel more valued as a member of staff, and that their self-efficacy in using videoconferencing will be heightened. As a result, they will use videoconferencing more in the future, resulting in their building up experience and reaffirming their commitment, and promoting its use to others within the network. |
| **Example of evidence** | *Because I have support from all my work friends and I have support from management, which is really good, and you feel good about yourself when you have support. You feel confident and you can walk round with your head held high, and you know you just -- you don't have to worry.* (Care assistant)  *I'm careful with my recruitment because we're over-staffed. We're never -- I say never in a particular -- under pressure to recruit quickly so we can take our time with the recruitment process and, you know, the fact that I'm here.* (Manager)  *If something doesn't get done, it's not the end of the world. On the next shift they'll quite happily pick it up… You've just got your senior and your care staff, and on a night time you've just got your night staff. So, if, for example, the laundry falls behind on a late, night staff pick it up. But if they can't do it all, it falls back on the laundry assistant in the morning. She's quite happy to carry on from where it's left off, as long as residents come first. They always have.* (Senior carer)  Researcher: *Have you noticed any difference with the staff? Like, have they become more confident or anything since the system has…*  Manager: *Yeah, you know, I think they enjoy you because it's -- (a) because the night staff use it and they're, you know -- they're not even seniors so… you know. So, you know, it's a confidence boost and it's there making decisions, connecting with clinicians directly.*  (See evidence for 'Culture' CMOCs) |

Table shows breakdown of emergent theory linked to senior fallibility

|  |  |
| --- | --- |
| **Inner setting characteristics: learning climate** | |
| **'Senior \*fallibility results in carers feeling valued'**  \*the need for team members' input and assistance | |
| **Explanatory (context and mechanism)** | Videoconferencing is a new method of healthcare provision that requires training. In contexts where senior members of staff admit they need assistance from care assistants, they are more likely to consider themselves valued partners in the change process. This increases members' feelings of psychological safety, making it more likely they will be willing to trial videoconferencing and build up their experience with the tool. |
| **Explained (outcome(s))** | This will build up their self-efficacy in using the system, encouraging them to reaffirm their commitment to videoconferencing. Upon seeing the benefits to using videoconferencing, the member of staff is then likely to become an advocate for the system and promote its use to others. This will increase the uptake of videoconferencing and make it more sustainable. |
| **Example of evidence** | *I think it's just teamwork really, and not thinking 'Well, I'm higher up than you so…' Do you know what I mean? There's not a lot of that here, because you have your different levels, don't you? But everyone just works together.* (Care assistant)  Researcher: *Had the senior member of staff kind of got more experience in using it then? How come, were they --*  *Care assistant: Yeah, they did. So, we sort of, you know -- supporting each other through it.*  Researcher: *And do senior members of staff ever ask for support from less senior members of staff?*  Manager: *Oh yes, yes, because we've got some very experienced carers and -- that have obviously worked here far longer than some of the seniors and know the routines, and so, yeah.* |

Table shows a breakdown of emergent theory linked to empowerment

|  |  |
| --- | --- |
| **Inner setting characteristics: learning climate** | |
| **'Empowerment supports use'** | |
| **Explanatory (context and mechanism)** | Videoconferencing is a new method of healthcare delivery that requires commitment from the care home staff in optimising its use to ensure optimal benefit for staff and residents. In contexts where staff feel empowered, either due to systemic factors (e.g. connections inside and/or outside of the organisation, through peers, etc.) or employment related structures (e.g. opportunities, resources, support), they are more likely to have higher self-efficacy, increased organisational commitment, and increased job satisfaction. Increased organisational commitment and job satisfaction will improve the effectiveness of the staff member's work, with increased respect and cooperation making staff more proactive in helping the care home achieve its goals. |
| **Explained (outcome(s))** | Staff will increase their commitment to effectively implementing videoconferencing, and supporting each other in its use, if they see this as a means of increasing the home's performance. This means that staff will gain more experience and formal or informal training, making it more likely it will be used, and the uptake and sustainability of videoconferencing are increased. |
| **Example of evidence** | *Er I've worked here for coming up to seven years. My mum's the deputy manager, so she's worked here 20 years. So, I've been coming up here every day since I was five, from school, so… My sister works here, my auntie works here, so it's fine.* (Senior carer)  *Well, I'm involved, I'm hands on, but is that a paradox? Hands on, but laid back… See, I don't like paperwork… Yeah, so, I supposed it's* *being more hands-on, and knowing what the problems are on the shop floor.* (Manager)  *Yeah, you know, I think they enjoy it* [videoconferencing] *because it's -- (a) because the night staff use it and they're, you know, they're not even seniors, so, you know. So, you know, it's a confidence boost and it's -- they're making decisions, connecting with clinicians directly.* (Manager)  *It's a nice place to work. Management are really good, you can go to them for anything. And I think if you've got a nice environment to work in then you're going to stop basically, aren't you? And a lot of people are related. My mum and sister both work here, so you kind of know everyone before you work here, and then everyone's like a big family, as such. It's a nice place to work.* (Care assistant)  *We get a lot of support from management, if you've got any issues. Erm I think it's quite a nice calm environment. You go to see places quite hectic and very stressful. It's quite nice here.* (Care assistant)  *Well, if you've got any issues, you can go to them with them and they try to deal with them straight away. They're quite good at giving you training and anything, like I've just been put through this diploma now, my diploma level three. So, they're always there for that.* (Care assistant)  (See evidence for 'Culture' CMOCs) |

* + 1. Individual characteristics

Individual characteristics were broken down into five sub-constructs: knowledge and beliefs about the intervention; self-efficacy; individual stage of change; individual identification with organisation; and other personal attributes. Self-efficacy was seen as the most pertinent, and the early CMOCs are presented below.

**Self-efficacy**

Another theme highlighted in this care home was that of self-efficacy. It became evident through the interviews that care assistants sometimes lacked confidence in knowing which service to access, and in approaching videoconferencing without the support of senior personnel. This was due to a fear of wasting time or exposing themselves to criticism (reduced psychological safety). Several CMOCs were developed in response to this construct. These are as follows.

Table shows a breakdown of emergent theory linked to staff confidence

|  |  |
| --- | --- |
| **Individual characteristics: self-efficacy** | |
| **'Low confidence hinders uptake'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides the opportunity to consult with a qualified nurse at a site remote from the home. In contexts where staff have less experience in managing resident health, they may be less confident about using videoconferencing, due to a lack of psychological safety. |
| **Explained (outcome (s))** | Staff who are less experienced in caring for residents will be less likely to access videoconferencing without the support of someone in a more senior post. The greater the number of senior staff employed at the home, the more likely it will be that videoconferencing will be used. As a consequence of this, the home will see more positive impacts of using videoconferencing, and the less senior staff members will observe these. |
| **Example of evidence** | *Yeah, we don't want to ring up and say -- I mean because we've had a couple of times with doctors, not hub doctors, but they've come out and said, 'Well, this could have waited until tomorrow', and it can knock your professional confidence really, because if you felt they needed it there and then and someone else is saying, 'No, this could have waited', you don't want to be making that decision again.* (Senior carer)  *I think it's just a confidence thing. I think they're not sure if it's going to turn into something bigger, whether or not they are going to need to go to hospital. Then obviously the on-call is going to have to be aware so that they can get up and take them, or whether they're not sure and don't want to ring up and seem silly about ringing it, if it can be solved without ringing them. I think it is more of a confidence thing, because they're not seniors on nights.* (Senior carer) |

Table shows a breakdown of emergent theory linked to previous experience using technology

|  |  |
| --- | --- |
| **Individual characteristics: self-efficacy** | |
| **'Previous experience using technology encourages self-efficacy in dealing with technical problems'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides a means by which residents can be assessed and treated by healthcare professionals in the privacy of their own home. In contexts where the signal is sparse within the care home, residents may have varying level of privacy if the signal is only available in public areas and is poorer in the resident's bedrooms. Depending on whether the member of staff is able to find a solution to issues caused by poor connectivity, this problem may heighten or decrease the level of self-efficacy towards videoconferencing. |
| **Explained (outcome(s))** | If self-efficacy is lowered, it is more likely that staff will revert to longstanding practices and routines. However, if a solution is found and self-efficacy is raised again, the commitment to using videoconferencing may be increased. This will encourage staff to heighten or maintain their effort and commitment to making videoconferencing work. They are thus more likely to seek out new ways of expanding the use of videoconferencing to help meet the needs of the residents, as well as promoting the use of videoconferencing to others. |
| **Example of evidence** | Researcher: *Is it easy to kind of implement the infrastructure of it?*  Deputy manager: *Yeah, yeah, no problems at all. We did have a few internet problems, but I mean that were just -- didn't last long.*  *Researcher: Oh okay, how did you resolve that? What was it? The signal?*  Deputy manager: *Yeah yeah, the manager just sorted it out.*  *Erm yeah, sometimes the signal does drop and you can't get hold of them. So, if that situation was to happen, then I'd use a telephone.* (Care assistant)  *Yeah, nine times out of ten, you get on quite well with it. Sometimes with the internet signal being a bit rubbish it can be quite hard to keep that connection. You end up having to ring back… People on the other side are lovely. They understand that it's a care home and they can't always see the person that they need to see because they're wandering somewhere else, and you have to pick up the computer and take it round after them. It can be quite stressful, but I've also found that if our Wi-Fi is playing up, it's very easy to connect it to a hot spot on your phone. So, I just hotspot it now, if I feel like it's not going to work in a certain part of the building. We are getting that fixed, getting it strengthened, but in the meantime…* (Senior carer) |

Table shows a breakdown of emergent theory linked to support

|  |  |
| --- | --- |
| **Individual characteristics: self-efficacy** | |
| **'Support to encourage use and increase self-efficacy and autonomy'** | |
| **Explanatory (context and mechanism)** | Videoconferencing provides support when it is required, which can be out-of-hours, for residents in care homes. In contexts where the staff members feel unsure of how to meet a resident's needs, they may be more inclined to seek out support from a member of staff who has better knowledge of the resident and more experience in managing resident care. |
| **Explained (outcome(s))** | It is more likely that a staff member will call an off-duty senior member of staff before consulting with the hub to clarify a resident's behaviour. As their self-efficacy grows over time and through training, knowing when to use videoconferencing and managing residents' needs will become less daunting, making it more likely that they will use it without checking first, and that the perceived ease-of-use of the system will improve alongside their self-efficacy. This makes it more likely that their commitment to using videoconferencing in the future will be heightened. |
| **Example of evidence** | *It's just a confidence thing. I think they're not sure if it's going to turn into something bigger, whether or not they are going to need to go to hospital. Then obviously the on-call is going to have to be aware so that they can get up and take them, or whether they're not sure and don't want to ring up and seem silly about ringing it, if it can be solved without ringing them. I think it is more of a confidence thing, because they're not seniors on nights. So, I mean some seniors do nights, but more times than not, they're not seniors. I think it's more just covering themselves. Is it ok for us to ring the hub rather than --* (Senior carer)  *Yeah, they do* [have the confidence to call the hub first]*. Yeah yeah, they do. Night staff have called the hub before, yeah. That's not an issue, yeah. I mean sometimes they've called me and I say, 'Hub it'.* (Manager)  (See CMOCs on 'self-efficacy' for more evidence) |

* 1. Summary

At the previous care home, the key themes linked to the use of videoconferencing were staff expertise, the health of the resident, managerial support, and the technical equipment.

These were explored in Care Home 1. In this care home, the theme of staff expertise seemed to be better explained by self-efficacy, which came with time and experience. The concept of 'managerial support' was also expanded to encompass culture, as this appeared to affect the home's ability to take up an intervention. Leadership in particular appeared to have an impact on the home culture, as well as staff commitment to remaining with the organisation and achieving its goals. This was further developed to be more inclusive of those aspects. Technical equipment was seen to affect self-efficacy and relative advantage, and so was included as part of these themes instead.

In addition, theories linked to tension for change, structural characteristics, learning climate, and readiness for change all emerged.

Going back to Case Study 1 and applying the CFIR framework to the previous findings/data, two more theories emerged. The first was about how medical training may affect use (structural characteristics), and concerning the relationship with the remote site (cosmopolitanism). Upon comparing responses with those in Case Study 2, these theories emerged as possible additional findings.

These theories will be explored further, and all of the theories will now be consolidated in Care Home 3, a home which does not use videoconferencing. The previous case studies aimed to refine theories on uptake and sustainability of videoconferencing. The next case study was designed to help consolidate these theories.

* 1. Case study 3: Case Study 3: A care home without videoconferencing and with no plans to implement it

Rationale for selection

This care home was selected due to the associated response to the survey question of, 'Which statement would describe your views towards videoconferencing?' The manager of the home responded that videoconferencing was unnecessary and they would only install it if it became compulsory. This home also differed the most from the other two cases in terms of ownership, rural urban code, and home type. This allowed for a greater range of theories to be tested.

Description of the home

The care home is a residential home that accommodates 39 residents. It is run by a charity/not-for-profit organisation that has several homes within the same city, and it is in rural/urban code B1 (minor conurbation). The home is split over three floors, two of which are for elderly mentally impaired residents (EMI), and the third is residential. It has no practising nurses on-site, however a nurse visits to attend to care needs such as wounds and dressings. A doctor also visits the home every Thursday for residents that are particularly ill.

The senior staff at the home are the manager, deputy manager, and three team leaders. The team leaders are responsible for managing the care of residents and supervising care assistants. There are 37 members of staff employed as care assistants, who had each received training as a part of their job. The home has three corridors, one on each floor. At night, there is a member of care staff on each corridor, and during the day there are two per corridor. The number of senior staff on duty is variable.

Use of videoconferencing by the home

The staff at the care home had not heard of videoconferencing before, and had never trialled it. In discussion of the system with the manager, she said that it could be something of value to their home, but she had been previously unaware of it. This suggests that a misunderstanding of videoconferencing and its uses might have led to the manager's initial response that it was unnecessary. The significance of access to knowledge about the intervention is a theory explored in this case study.

**Method of data collection in the home**

Interviews were conducted with the manager, two relatives, one activity coordinator, two staff employed as care assistants, and one team leader employed to manage appointments and care for residents. Field notes were also taken.

The interviews were based on the findings and the Consolidated Framework for Implementation Research (CFIR) (6.5 and Appendix 8) (CFIR Research Team 2017). The findings have also been reported following the format of the CFIR framework (CFIR Research Team 2017).

* 1. Results

The context mechanism outcome configurations (CMOCs) presented in Case Study 2 were developed as a result of data collection in Case Studies 1 and 2, and these theories were then tested in Case Study 3. This was done by identifying the contextual factors which were not present in Case Study 3 but which had been available in Case Study 2. This was done to confirm and disconfirm the theories previously developed. Where applicable, theories were refined and new ones developed. The theories presented below were developed throughout all three case studies.

The underlined text indicates areas where theories have been refined. Additionally, a table highlighting the mediating and moderating factors present in each theory was developed below each CMOC. This aided the development of the readiness assessment report to highlight the factors which could/could not be changed by the care home (Baron and Kenny, 1986).

All CFIR constructs that were excluded have been reported, with a justification given for each exclusion.

* + 1. Intervention characteristics

Here, the previous theories relating to relative advantage are included, along with new theories surrounding trialability, complexity, and design quality and packaging.

1. **Intervention source:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a theme. The only issue that emerged that may be in some way linked to this was the relationship between nurses at the hub and at the remote site. However, the researcher believed that this was a better fit under the theme of cosmopolitism (pp.180). Also, the manner in which the intervention was developed (externally or internally) was not mentioned.
2. **Evidence strength & quality:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a theme. This may be because there is very little evidence regarding the use of videoconferencing in care homes and its effect on outcomes. The home at the centre of Case Study 1 was taking part in a trial, but it was only thought to be useful in aiding implementation in that the home was feeding back to the local CCG on problems they encountered using the system. Therefore, this was not suitable for inclusion in the construct.
3. **Relative advantage:** This was included. See a relevant theory identified below.

**'Faster response supports uptake'**

* Mechanism (resource): Videoconferencing provides quick access to healthcare expertise.
* Context: In contexts where staff members recognise the need for residents to be seen quickly, and do not receive timely responses from alternative services, staff are more likely to want to reduce the resident's discomfort as soon as possible.
* Mechanism (reasoning): This will make it more likely that videoconferencing is used to access healthcare, advice, and services. Staff are able to see the difference in speed compared to other services, which makes it more likely that they will reaffirm their commitment to using it.
* Outcome: As they use it more, and they become familiar with the system, the perceived ease of use will increase. This may result in it being used more, and so the uptake and sustainability of videoconferencing is increased.

**Evidence:**

Researcher: *Oh okay, have you ever heard from other members of staff about how they find using the services? For example, has a member of staff every gone, 'Oh 111 was rubbish yesterday', or…*

Activity coordinator: *Erm no no, when I've dealt with them, they've been excellent, the response times.*

Researcher: *With 111?*

Activity coordinator: *Yeah, they've been very good.*

*Researcher: So, what's your opinion of the services that are currently available, like out-of-hours? So, what's your opinion of like 111?*

Care Assistant: *Oh they're very good, they never let us down, you know, if -- you know, sometimes you make a call and it may not be 100% necessary. They'll still attend. They never say, 'Why did you call? You needn't call us for that, you know'. You know, so, they are good.*

**Discussion:** This CMOC ('Faster response supports uptake') appeared to be supported by staff perceptions, however it was further refined (underlined) as at this home it appeared that alternative services were providing a service that was deemed to be timely. As a consequence, there was not the same tension for change (see CMOC on 'Tension for change supports uptake', pp.196) as speed of access was not a problem for this home (CMOC on 'Faster response supports uptake', pp. 169). The evidence provided by the care assistant also suggests that psychological safety when using alternative services was higher (CMOC on 'Psychological safety supports use', pp. 182). This meant that staff saw less value in accessing videoconferencing (CMOC on 'Trialling videoconferencing supports uptake', pp. 174). This links to work discussed in programme theories (5.4, pp.100) on psychological safety (Edmondson et al., 2001).

**Mediating and moderating factors:**

Table shows a the breakdown of mediating and moderating factors relating to faster access to services and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Recognise the need for residents to be seen quickly.  Observe the difference between videoconferencing and alternative services  Commitment to using videoconferencing |
| Moderating |  | Do not receive a timely response from alternative services |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Low confidence in communication encourages uptake'**

* Mechanism (resource): Videoconferencing allows for the patient to be seen through audio-visual technology.
* Context: In contexts where staff are not confident about conveying the situation to a remote member of staff using purely audio technology, staff are more likely to want to show the situation to the remote member of staff.
* Mechanism (reasoning): This makes it more likely that videoconferencing will be used to help convey the situation and seek advice.
* Outcome: This results in residents obtaining a quicker and more accurate diagnosis than that obtained from purely audio technology, increasing staff competence and feelings of self-efficacy. This makes it more likely that appropriate treatment is received and the wellbeing and health of residents is improved long-term. With this being observed, uptake and sustainability of videoconferencing will increase.

**Evidence:**

*Well, on video, wouldn't they be able to see patient? So, that is main thing, ain't it? They see -- even if it's only on a video, they see patient, and you can see from looking at people what people are like, can't you?* (Relative)

Researcher: *And do you think there would be anything that would be particularly good about it? Or…*

Activity Coordinator: *I think with it being face-to-face is the main thing.*

Researcher: *And how do you find the 111 service?*

Manager: *Erm it's not too bad. It's all right, but like they can't see them, can they? So, they can't see them, so it's hard. I mean we do on-call, and they'll call and say, 'Oh so-and-so's fallen down and they've got a bruise this size', but you can't see it so then you have to physically go out and have a look.*

**Discussion:** This CMOC ('Low confidence in communication encourages uptake')may be partly explained by self-determination theory: videoconferencing could enable staff members to feel more competent in their jobs if they had difficulty communicating using purely audio technology (Marylène et al., 2005). In addition to this being partly explained by self-efficacy, positive physiological feedback (a positive experience of the system) encouraged continued use and self-efficacy (Schonfeld et al., 2017) (CMOCs on self-efficacy 7.8.4). Finally, this CMOC also supports the theories of 'perceived presence' (Sävenstedt et al., 2004) (Chapter 6.8.4). The perceptions here again appear to support the developed CMOC and so were not amended.

**Mediating and moderating factors:**

Table shows a the breakdown of mediating and moderating factors relating to staff confidence and uptake/ sustainability

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Factor | Mediating |  | Staff confidence with conveying medical situation to remote member of staff  Staff confidence with undertaking activities in different ways, such as using technology, observing the benefits of videoconferencing over purely audio technology | |
| Moderating |  |  | |
|  |  | Low impact | | High impact |
|  |  | Impact on outcome | | |

1. **Adaptability:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a theme. No participants stated that they would prefer it to be used for something else, or that the range of purposes aided uptake. It was instead seen as a set service to be used when staff were unsure of something, primarily out-of-hours, and the relative advantage over services such as 111 appeared to be a key mechanism for adoption (pp.169).
2. **Trialability** wasincluded. See relevant theory below.

**'Trialling videoconferencing supports uptake' (NEW)**

* Mechanism (resource): Videoconferencing is a new means of delivering healthcare.
* Context: In contexts where staff at the home are able to trial the services as a result of having the time, resources, and opportunity from videoconferencing providers.
* Mechanism (reasoning): They are more likely to be able to develop their vicarious and performance experience, being less fearful about the outcomes, and observing the benefits of use.
* Outcome: As a result, staff are more likely to build up their experience, which in turn will help them develop their self-efficacy in using the system, thus increasing the uptake and sustainability of videoconferencing.

**Evidence:**

Researcher: *How would you feel about learning a new task? If they brought in videoconferencing, how would you feel about learning it?*

Carer: *Be all right. I learn more when I'm like doing stuff instead of like sat looking, do you know, like? I learn more doing it than being in a classroom.*

Researcher: *So, if you got hands-on experience and you got to try it?*

Carer: *Yeah.*

Researcher: *So, do you think if you were to use it, you might be sort of confident or unconfident?*

Carer: *I think the first time I'd use it, I'd be a bit wary because I've never done it, but I think after that I'd be all right.*

**Discussion:** This CMOC ('Trialling videoconferencing supports uptake')was introduced at a later stage, when reflection on the findings suggested that uptake and sustainability may be related to the ability to trial the system. This was not originally included as both homes had had the opportunity to trial the system. On reflection, this was clearly an important factor where there were other contextual factors that allowed for trialling within the home, such as time and resources (see CMOC on 'Size supports dissemination of information', pp.186), and where staff had the psychological safety required to trial the system (Edmondson et al., 2001) (Chapter 5.4, pp.100). This could then be a driver for uptake and sustainability, allowing staff to build their vicarious and performance experience, whilst being less fearful of outcomes. This again links with the work on self-efficacy (Schonfeld et al., 2017) (Chapter 5.4, pp.100) and adds to the feedback loop of building up positive experiences, which then become a driver for uptake. The evidence provided above demonstrates the importance of being able to trial a system, despite this home not having videoconferencing.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to trialling videoconferencing and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating | Outcome from the call | Time to be able to trial the system  Psychological safety that allows for trial  Support in trial |
| Moderating | Staff's previous experience with technology |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

1. **Complexity** was included. See relevant theory below.

**'Technical** **difficulties could endanger uptake' (NEW)**

(Originally aggregated as part of 'Previous experience using technology encourages self-efficacy in dealing with technical problems' in Case Study 2 results)

* Mechanism (resource): Videoconferencing provides a means by which residents can be seen in the privacy of their own home.
* Context: In contexts where signal is sparse within the care home, residents may have varying levels of privacy, for example if the signal is only available in public areas and is poorer in residents' bedrooms.
* Mechanism (reasoning): Depending on whether or not a solution is found, this will either heighten or decrease staff confidence in using videoconferencing, and influence videoconferencing's (dis)advantage relative to other services.
* Outcome: If the problem can be addressed by the providers in a timely manner, staff may be encouraged to heighten or maintain their effort and commitment to making videoconferencing work. This means they will be more likely to seek out new ways of expanding the use of videoconferencing to help meet the needs of the residents, as well as promoting the use of videoconferencing to others. However, if they are unable, this many endanger confidence in the system and result in the discontinuation of use.

**Evidence:**

* Manager: *There are a few staff that are really scared of computers, and because we do e-learning and they're like, 'I can't do it, I can't do it', and I'm like, 'Yeah you can, you just click. It's so easy'. And once they've been on it -- so, I think it's that initial, 'Oh god, I can't do it'. The young ones are like, 'Deh deh deh', you know. It's the older end, the older end. We've got one who's 67 on nights, and she's like, 'Oh I don't know, I don't know'. I think it's just fear a little bit with them. So, I think we might have a little bit, 'Oh no, I can't I can't'.*
* Researcher: *And do you think the younger ones take to it more perhaps because they've been exposed to it more?*
* Manager: *Oh yeah, because they have to do e-learning and we've got them all on that now. It's really easy and basic, but if screen goes blank or owt, they're like, 'Oh no, what have I done!'*
* *I think the first time I'd use it, I'd be a bit wary because I've never done it, but I think after that I'd be all right.* (Care assistant)

**Discussion:** This CMOC ('Technical difficulties could endanger uptake')was previously aggregated with self-efficacy using videoconferencing, but has been refined and separated so as to help clarify outcome patterns. The CMOC was separated to focus on the technical aspects and how these may be linked to outcomes. These quotes demonstrate how technical problems can influence uptake through their impact on staff confidence in the system. This seems to be part of a feedback loop evident in most of the CMOCs, where the observability (relative advantage) and feedback from the outcome of the call negatively or positively influences uptake and sustainability of the intervention, again linking to the theory of self-efficacy (Schonfeld et al., 2017).

**Mediating and moderating factors:**

Table shows the breakdown of mediating and moderating factors relating to technical difficulties and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating | Outcome from the call  Commitment to making intervention work | Staff’s actual ability to deal with technical problems  Self-efficacy in using videoconferencing |
| Moderating | Staff’s previous experience with technology | Strength of internet connection |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

1. **Design Quality & Packaging** was included. Please see relevant theory below.

**'Packaging can affect use' (NEW)**

* Mechanism (resource): Videoconferencing provides a means by which residents can be seen anywhere in the care home.
* Context: In contexts where staff struggle to get a laptop in the proximity of the resident due to being unable to move the system with ease.
* Mechanism (reasoning): This may make staff increasingly frustrated when trying to use the system, especially when it takes too long to set up.
* Outcome: This would hinder the use in the long-term and have an impact on uptake and sustainability of use.

**Evidence:**

(As this was identified as a new theme after reviewing all of the final CMOCs, it was not raised in Case Study 3. Evidence has therefore been taken from prior case studies.)

(Case Study 1): *Basically it depends on the resident, if it's quicker to call 999, they'll do 999 rather than get the medical across, because you've got 34 rooms here and to get it to the top it basically may be quicker to get the phone then get it up and then set up.* (Senior Carer)

(Case Study 1): *No, they came and just the nurses said they were in touch with \*\*\*\*\*\* and they go out into the corridor and chat, and I've got no idea what they're doing unless they come in to say, 'We're going to this with you and that with you'.* (Resident)

(Case Study 2): *The people on the other side are lovely. They understand that it's a care home and they can't always see the person that they need to see because they're wandering somewhere else and you have to pick up the computer and take it round after them.* (Senior carer)

**Discussion:** This CMOC ('Packaging can affect use') was only introduced after reviewing all the CMOCs on data collection. Upon taking a closer look at the influence the service may have had on use, it became apparent that the mobility of the equipment may be an issue. A couple of participants mentioned being able to move the laptop as a positive, but this appeared to be hampered as mobility was limited by signal. Case Study 1 (where use was discontinued) mentioned frustration in the time needed to set up the laptop. Issues related to signal were included in the CMOC on complexity and in self-efficacy instead (see CMOC on 'Technical difficulties could endanger uptake', pp.174). However, this CMOC could also be linked to self-efficacy and relative advantage (Schonfeld et al., 2017) (see CMOC on 'Faster Response Supports Uptake', pp.169), as performance outcome may affect individuals' confidence in using the system again, with staff reverting back to more traditional methods.

**Mediating/ moderating factors:**

Table Shows the breakdown of mediating and moderating factors relating to packaging and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating | Commitment to making intervention work | Self-efficacy in using videoconferencing  Time available for set-up/speed of access required  Workload of staff member/available resources |
| Moderating | Staff's previous experience with technology | Structural architecture of building |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

1. **Cost:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. Participants mentioned that the service was free as costs were absorbed by the NHS, but use of the service was not believed to have saved the home much money.
   * 1. Outer setting
2. **Patient needs & resources:** Although this sub-construct does not have any theories directly related to it, there are theories covered in other parts of the chapter that are indirectly related. Patient needs and resources played a role because the service was intended to support equal access to healthcare; a lack of equality being a barrier to good care for residents in care homes. It was also expected to improve resident outcomes. Participants mentioned that the intervention had improved care, but these theories were deemed more appropriate for coding under 'relative advantage' (pp.169) and 'tension for change' (pp.196).
3. **Cosmopolitanism:** This was included. See relevant theories below.

**'Unequal relationships hinder use'**

* Mechanism (resource): Videoconferencing provides remote access to healthcare.
* Context: In contexts where home staff feel inferior to the staff at the remote sites, and have residents that are suffering greater ill health, staff may be less likely to call until they have made every effort to treat the resident using support within the home. However, where they consider themselves equal partners, and they are working alone, it may help to reduce the professional isolation.
* Mechanism (reasoning): It is more likely therefore that the resident will be in need of urgent help by the time the staff approach telemedicine. However, when they consider themselves equal partners, nursing staff may call sooner to ask for advice.
* Outcome: If they consider themselves unequal partners, it is more likely that they will require a speedy response, and if the hub does not respond quickly then confidence in the system will be lost. Uptake and sustainability of videoconferencing will be reduced. However, if videoconferencing is used for advice (when staff consider themselves equal partners), it is more likely that uptake and sustainability will be increased.

**Evidence:**

*Well, they don't know that at the time obviously. They just go by what we're saying, but obviously we're not medically trained so we tend to… You know if somebody looks bad, we tend to call.'* (Care Assistant)

*Well, the good thing is it would cut out -- obviously with the hub with these type of homes, people aren't medically trained and that, but you can recognise things. You know these people that well that you can recognise things and it's whether you need to push, like I say, whether you need to ring help or not. Whereas if you had some sort of advice and say, 'Look, this has happened to this person. What do you think we need to do?' that side of it might be good.* (Care Assistant)

*I think sometimes because you're a bit unsure as to when to ring 111 and stuff like that because we're not nurses and we're not doctors, we're care assistants and we're not medically trained, so sometimes you do sit back and think: do I get a GP? Don't I? You sometimes feel a bit of a nuisance, but then you speak with your other team leaders and think: right, we do need to ring and get some advice. So, it would be nice to have that and not feel like you're being a pain in the backside.* (Team Leader)

**Discussion:** This CMOC (**'**Unequal relationships hinder use') was difficult to test in Care Home 3 as there were no nurses. Perceptions were more about the services to access when recognising a resident is unwell, and staff feeling less able to deal with minor ailments (see CMOC on 'Untrained carers support use', pp.188). However, staff said that they would appreciate being able to ask for advice without feeling like a nuisance, and this implies that when staff do not feel like equal partners in an exchange, their psychological safety is threatened. This is thus evidence in support of the CMOC.

This CMOC may in part be explained by Rosanbeth Kanter's structural theory of power, which is concerned with feelings of empowerment through relationships within and outside the organisation (Laschinger et al., 2001). In addition, it may relate to Bandura's work on self-efficacy, with the physiological feedback received upon calling the hub or alternative services (such as 111) affecting self-efficacy, and thus willingness to use the hub or other services again (Schonfeld et al., 2017), as well as theories of promoting presence at a distance and feelings of security (Sävenstedt et al., 2004). However, this CMOC was refined further (underlined text) after reviewing data from Case Study 1, as it appeared to be associated with faster deterioration of residents in nursing homes. In light of this, the CMOC remains unchanged.

**Mediating and moderating factors:**

Table shows the breakdown of mediating and moderating factors relating to unequal access and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Staff feel inferior to the staff answering at the remote site  How long staff leave it to call |
| Moderating |  | Resident health/ onset of symptoms  Response time of hub |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Psychological safety supports use'**

* Mechanism (resource): Videoconferencing provides remote access to healthcare.
* Context: In contexts where staff feel they have greater psychological safety when using videoconferencing than alternative services.
* Mechanism (reasoning): Staff may be more likely to favour calling the hub over other services.
* Outcome: This makes it more likely that the hub will be used frequently, and that staff confidence in accessing remote support for residents will increase, and the health and wellbeing of the residents will consequently improve. Upon staff observation of this, uptake and sustainability of videoconferencing will increase.

**Evidence:**

See evidence for CMOC above.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to psychological safety and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Staff feel level of psychological safety contacting hub |
| Moderating |  | Staff feel level of psychological safety contacting alternative services |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**Discussion:** This CMOC (**'**Psychological safety supports use')is supported by the evidence, with most staff stating that it would be nice to be able to ask for advice from remote health care services, without feeling like they are an inconvenience. Care staff reported being less able to deal with minor ailments and therefore having to access health services more frequently for less urgent reasons than nursing staff. This was sometimes met with criticism from out of hours health care staff, which reduced the confidence of care staff in managing resident care and seeking advice from remote services (see CMOC on 'Untrained carers support use', pp.188; and 'Unequal relationships hinder use', pp.180). This can again be linked to the theory of self-efficacy and physiological feedback, as when staff are free from the fear of criticism this increases their self-efficacy (Schonfeld et al., 2017) (Please see 5.4, and CMOCs in 'Characteristics of Individuals', Chapter 6.8.4). This also links to the psychological safety discussed in 'Grand/ middle range theory' (Edmondson et al., 2001) (Chapter 5.2).

1. **Peer pressure:** This was not included as, again, it was not raised as a pertinent issue, and the relatives interviewed said they were unaware that the home was using the system. This suggests that it is not well advertised to stakeholders outside of the home, and as a result, the system is not used to gain a competitive edge over other care homes in the area.
2. **External policy & incentives:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. The main driving force for use appeared to be more to do with resident outcomes and the influence of their commitment to the care home, staff, and residents (pp.198) than influenced by external policy.
   * 1. Inner characteristics
3. **Structural characteristics**: This theme was included. See theories below.

**'Team stability supports psychological safety'**

* Mechanism (resource): Videoconferencing provides a new and innovative way of delivering healthcare.
* Context: In contexts where there is strong team stability and low staff turnover, members are likely to have increased psychological safety.
* Mechanism (reasoning): This makes it more likely that staff will feel able to try new methods, so they will be more likely to trial videoconferencing and build up their experience.
* Outcome: This will build up their self-efficacy in using videoconferencing, helping them to reaffirm their commitment to videoconferencing. Upon seeing benefits to using videoconferencing, the member of staff is then likely to become an advocate for the system and promote its use to others. This increase in uptake will make it more sustainable.

**Evidence:**

Researcher: *Ok and how easy is it to get cover for shifts?*

Team Leader: *[laughs] It's okay, it's not too bad. At the moment, it's a hard time at minute, we're struggling. It's generally not too bad, we do have to use agency on occasions, but it's generally not too bad. We do have a good staff team who will pick up. So, generally all right.*

Researcher: *And what's the staff turnover like as well? Like, do people tend to come and stay, or is it quite a high staff turnover?*

Team Leader: *Er the ones that are here at minute, we have got a few new starters, mainly night staff, but lately it's been night staff that have come. But we have got a few that are long-term, but us care assistants are generally… yeah* [inaudible]*.*

**Discussion:** This CMOC ('Team stability supports psychological safety') was supported as there appeared to be team stability with some core staff, but there also seemed to be a high rate of night staff turnover. This theory again links to the work on psychological safety discussed in the key theories section (Edmondson et al., 2001) and to the theories of self-determination (Marylène et al., 2005) and self-efficacy (Schonfeld et al., 2017) (Chapter 5.4), as psychological safety and team stability enable the member of staff to feel comfortable and build up their performance outcomes experience (Edmondson et al., 2001) (see CMOCs on self-efficacy, pp.213). As the researcher believed this CMOC was supported by the evidence, it was not amended.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to team stability and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating | Commitment to videoconferencing | Team stability  Psychological safety  Develop experience using Videoconferencing  Staff confidence to undertake activities in different ways, such as using technology, observing benefits of videoconferencing  Advocates for videoconferencing |
| Moderating |  |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Size supports dissemination of information'**

* Mechanism (resource): Videoconferencing provides a new method of healthcare delivery that requires training.
* Context: In contexts where there is a high ratio of senior members of staff to care assistants, and the home is small, peer and managerial influence and information about the innovation is more likely to be spread.
* Mechanism (reasoning): This will help to disseminate support for the use of videoconferencing, which would lead to greater encouragement/uptake amongst staff.
* Outcome: This means the uptake of videoconferencing is likely to be more widely spread amongst staff in the home.

**Evidence:**

Manager: *What have we got – a deputy, three team leaders, and me, and then we used to have senior care, but we don't have senior care anymore. They got rid of senior care.*

Researcher: *How come?*

Manager: *I don't know. A few years ago, they got rid of senior care, but I think that was a bad idea.*

Researcher: *How come?*

Manager: *Because the senior care are the next team leaders. They had a little bit more responsibility. So, we were struggling then to get team leaders because we got rid of senior care. There were no stepping stone, so it were like care to team leaders and it's a big jump. So, we started the* [redacted] *scheme a couple of years ago, and actually all of my team leaders have been on the* [redacted] *scheme. So, it is working.*

Researcher: *And how many care assistants do you have then, if you have about three team leaders?*

Manager: *Erm I have about – I totted them up the other day actually – about 37.*

Researcher: *And what are your views on working here? Like, what is it that you like about this home?*

Activity Coordinator: *I think it's because I came from a larger home and this is a lot smaller. It's just a better working environment, I think, being in a small home. The staff get on better, because there's not so many and the communication's better.*

Also, see evidence for 'Communication culture encourages trust' (pp.193).

**Discussion:** This CMOC (**'**Size supports dissemination of information') was supported by the evidence. There was a very low ratio of senior staff to care assistants and dissemination of knowledge and information was hindered, which supports this theory. This also supports the evidence for communication and trust and the work discussed by Zeffane et al, (2011 in the key theories section (Chapter 5.4). There appeared to be breakdown in communication, and the home was large. The home has three floors, 39 residents, 37 care staff; and only three team leaders, one deputy manager, and one manager. ('Communication culture encourages trust' (pp.193). Therefore, this CMOC will not be amended.

**Mediating and moderating factors:**

Table shows the breakdown of mediating and moderating factors relating to the size of the organisation and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | High ratio of senior members of staff to care assistants  Peer and managerial influence and information more likely to spread  Disseminate support  Encourage engagement and uptake |
| Moderating |  | The home is small |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Untrained carers support use'**

* Mechanism (resource): Videoconferencing provides remote access to healthcare.
* Context: In contexts where staff have a reduced ability to make decisions about resident care, they are likely use videoconferencing more frequently to seek reassurance from external staff about resident health.
* Mechanism (reasoning): Therefore, the staff in these contexts are likely to call in situations that are less urgent, making it more likely that they will be willing to stay on hold longer before approaching a GP or calling 999 to get a faster response
* Outcome: This means that videoconferencing may be used more frequently to seek advice and support in this context, which will increase its uptake and sustainability.

**Evidence:**

Researcher: *Okay, and what kind of impact do you think videoconferencing would have on the home generally?*

Manager: *I think they'd use it quite a lot, you know, if it were there. I think they would sometimes use it when it weren't necessary. I think they'd think, 'I'll just check that'.*

Researcher: *In what way do you think it might be quite good? Or, what do you think might be bad about it?*

Care Assistant: *Well, the good thing is it would cut out… obviously with the hub, with these type of homes, people aren't medically trained and that, but you can recognise things. You know these people that well that you can recognise things and it's whether you need to push, like I say, whether you need to ring help or not; whereas if you had some sort of advice and say, 'Look this has happened to this person, what do you think we need to do?' That side of it might be good.*

*I think sometimes because you're a bit unsure as to when to ring 111 and stuff like that, because we're not nurses and we're not doctors, we're care assistants and we're not medically trained. So, sometimes you do sit back and think: do I get a GP? Don't I? You sometimes feel a bit of a nuisance, but then you speak with your other team leaders and think: right, we do need to ring and get some advice. So, it would be nice to have that and not feel like you're being a pain in the backside.* (Team Leader)

**Discussion:** This evidence supports the CMOC (**'**Untrained carers support use') and so will remain unchanged. This theory links to the self-determination model, as it concerns care staff members' feelings of competence and confidence in managing resident care (Marylène et al., 2005).

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to untrained carers and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Need for staff to be reassured about health of resident  Situation for which videoconferencing is used |
| Moderating |  | Staff ability to make decisions about resident care  Speed of response from the hub |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Medical training hinders use'**

* Mechanism (resource): Videoconferencing provides remote access to healthcare.
* Context: In contexts where staff have more medical training, it is more likely that they will be able to deal with minor ailments within the care home team and using the current services.
* Mechanism (reasoning): This means staff are more likely to use videoconferencing in more urgent situations to try and prevent unnecessary admissions.
* Outcome: This may mean that calls necessitate faster responses, and where the hub does not respond quickly, confidence in the system is lost. This will reduce the uptake and sustainability of videoconferencing.

**Evidence:**

See evidence for 'Untrained carers support use' (pp.188).

**Discussion:** The evidence supports this CMOC (**'**Medical training hinders use')and so will not be amended. This again feeds into the theory of self-efficacy, in that staff may lose confidence in using the system when the response from the hub and associated outcomes are slow. In addition, they may not observe as many benefits as other homes do when using the system, and so may be more likely to revert back to older methods of healthcare delivery (Schonfeld et al., 2017)( 'Faster response supports uptake' (pp.169)). This feeds into a positive feedback loop, with positive experiences encouraging the uptake and sustainability of videoconferencing.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to medical training and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Level of medical training amongst staff  Ability to treat more minor ailments |
| Moderating |  | Services currently available  Resident health  Hub response time |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

1. **Networks & communications:** Thenetworks and communications sub-construct was seen as an important part of the shared learning and in promotion of the system. However, the theories developed were a better fit under culture (pp.191, 191), structural characteristics (pp. 184), and managerial engagement (pp. 207). This is because the networks and communication appeared to be better linked to leadership (pp. 204, 209) and the kind of culture that was promoted in the care home (pp.189, 193), as well as to having the time and resources to share learning. Communication and networks also seemed to be fostered by the characteristics of a flatter hierarchical structure in the home (pp. 184).
2. **Culture:** This was included. See theories developed below.

**'Culture supports commitment and self-efficacy'**

(This CMOC was originally aggregated as part of 'Managerial autonomy supports commitment and identification with the organisation', 'Managerial autonomy supports advocacy' in the Case Study 2 results, under 'Leadership, culture and identification with organisation')

* Mechanism (resource): Videoconferencing provides a new and innovative method of healthcare provision.
* Context: In contexts where managers nurture a positive culture, employees have higher rates of job satisfaction.
* Mechanism (reasoning): This means that staff are more likely to work well together and have greater commitment to developing their self-efficacy in videoconferencing.
* Outcome: Staff will use the tool more and develop their experience, which they will then pass on to others, allowing them to go through the same process and making the adoption of videoconferencing more sustainable.

**Evidence:**

*Erm, they are and they aren't. The manager, she's not very supportive, she wouldn't help you out. The team leaders will, and the deputy manager will, but she won't and sometimes on a weekend we've been really short of staff and she won't come in on a weekend.* (Care assistant)

*Yeah in my erm… yeah my daughter's pregnant at the moment and she had a bit of a do during the night. My wife was at work and my daughter phoned her, and she was like, 'Right, I'm coming home'. And she phoned the duty manager up to tell her what was happening. The duty manager was here within five minutes.* (Care assistant)

*Just everything. The staff. We've got a nice staff team. We do pull together and we get on with it. Err we've had a few managers, but* [redacted] *has got it going great now, and the residents, you do… you get attached, and it is a lovely, lovely home. It's got a nice feel to it. A little family. It is nice, it's really nice. Hard going at times, but it's good.* (Team leader)

Researcher: *Okay, and what do you think that staff retention is like? Is there quite a high staff turnover, or do people come and stay?*

Care Assistant: *No, all the staff that's been here have been here since I've been here.*

Researcher: *And what do you think it is about the home that makes people want to stay?*

Care Assistant: *Well, it's a bit awkward because a lot of them don't want to at the moment*

**Discussion:** This CMOC ('Culture supports commitment and self-efficacy') was refined based on the data from Care Home 3. Where the manager is able to convey a positive care home culture, this influences outcomes and improves commitment. In this home, it appeared that there were mixed views over the supportiveness of the manager, so there may be varying levels of commitment, which may in turn influence the uptake of any intervention ('Opinion leader advocacy supports uptake' pp. 221; 'Tension for change supports uptake', pp.196). This work can be explained by theories present in 'Grand/ middle range theory' (Chapter 5.2) (Edmondson et al., 2001, Avolio et al., 2004), which suggests that leaders influence the care home culture with the staff they choose to employ, and this affects staff turnover and job satisfaction amongst employees. (This is further explained in 'Effective recruitment of staff results in employees feeling valued', pp. 199).

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to culture and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating | Staff commitment to developing their self-efficacy in videoconferencing | Job satisfaction  Staff identification with the organisation  Employees work together effectively Shared learning  Care home culture portrayed by manager |
| Moderating |  |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Communication culture encourages trust'**

* Mechanism (resource): Videoconferencing is a new method of healthcare delivery that requires commitment from the care home staff to optimise its use to ensure optimal benefit for staff and residents.
* Context: In contexts where leadership style and culture are effective in promoting a strong communication culture, trust and commitment within the organisation are likely to be increased.
* Mechanisms (reasoning): Increased amounts of trust will lead to greater organisational commitment, and greater proactivity in helping the care home achieve its goals.
* Outcome: Staff are more likely to remain committed to effectively implementing videoconferencing, and supporting each other in using it, when they see the tool as a means of increasing the home's performance. This results in staff gaining experience through formal or informal training, making it more likely that videoconferencing will be used.

**Evidence:**

Researcher: *And what do you think it is that's kind of kept you here? How do you find the work environment?*

Care Assistant: *Erm, it's handy because I live just up the road.*

Researcher: *So, is that senior staff as well? Do you all gel?*

Care Assistant: *No comment* [laughter]

Researcher: *How do promotions work and things like that?*

Care Assistant: *No, when I first came here, I came as a care assistant but because I've actually got a* [edited out] *the manager at the time said, 'Would you like to be a team leader instead?' So, I started as a team leader, but the company got shut of her. I don't know why. And this new manager came and she booted me and two others who were training to be team leaders off, back down to care assistants. And there was, 'You can do it again in another six months, if you want', but I've been here 3.5 years and I'm still… you know.*

Researcher: *Oh, sorry about that.*

Care Assistant: *I was, but I'm not now. I wouldn't want to be now.*

*Oh erm, how would I describe it? Firm, but fair. I'm approachable, but I don't like people, you know, when they're obviously taking mick. I don't like that, but I am approachable and if I can help them I will.* (Manager)

*I don't know. A few years ago, they got rid of senior care, but I think that was a bad idea* (Manager)

Researcher: *How come?*

Manager: *Because the senior care are the next team leaders, they had a little bit more responsibility. So, what we've started doing now is the* [redacted] *programme. So, anybody who wants to be a team leader, we spend some time going through the team leader role with them so we have additional time spent on them to learn that. So, we were struggling then to get team leaders because we got rid of senior care, there were no stepping stone. So, it were like care to team leaders, and it's a big jump.*

**Discussion:** The above CMOC (**'**Communication culture encourages trust')is supported by the participants' perceptions.

The evidence demonstrates that there was a breakdown in communication between the management and care staff. The care assistant reported being unsure of why a development opportunity had been removed from the home. This resulted in the care assistant being distrusting of the manager.

The manager agreed that this opportunity should not have been removed, and expressed their disappointment about this. This possible miscommunication, and the care assistant being unsure as to why the development opportunity had been removed, may be affecting trust and reducing the staff member's commitment to the organisation. This supports the work by Zeffane, et al. (2011), who looked at the link between communication, trust, and organisational commitment (Zeffane et al., 2011) (Chapter 5.4.1; 'Size supports dissemination of information', pp.186). Zaffane et al. (2011) stated that increased face-to-face communication helps the development of trusting relationships. There has been here a breakdown in communication that affected trust. This links with one of the key theories on authentic leadership and how managers who portray hope, trust, and positive emotions have followers who are more committed and give extra effort (Avolio et al., 2004) (Section 5.4.1.2, pp. 202; 'Culture supports commitment and self-efficacy', pp. 191). In light of the evidence, this CMOC was not amended.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to communication culture and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Leadership style and culture are effective in promoting a strong communication culture  Trust and commitment to the organisation  See the benefits of repeatedly using the system  Formal/ informal training |
| Moderating |  |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

1. **Implementation Climate**
2. **Tension for change:** This was included. See relevant theory below.

**'Tension for change supports uptake'**

* Mechanism (resource): Videoconferencing provides a new and innovative method for delivering healthcare.
* Context: In contexts where there is a low opinion of alternative services (e.g., out-of hours, remote support, 111), and there are strong communication links with staff in the care home
* Mechanism (reasoning): staff are more likely to seek to avoid the problems associated with alternative services, and dissatisfaction with the current status quo may build, creating a more homogenous environment, in which there is general dissatisfaction with alternative services. This will make it more likely that staff will use the hub, where they can speak to a nurse and quickly show them the problem, thus speeding up the access to appropriate health support. Staff will therefore increase their commitment to using videoconferencing
* Outcome: This will result in reduced resistance to change, making it more likely that videoconferencing will be widely adopted, and so in the long-term will improve access to healthcare for residents.

**Evidence:**

Researcher: *So, what's your opinion of the services that are currently available, like out-of-hours? So, what's your opinion of like 111?*

Care Assistant: *Oh they're very good. They never let us down, you know, if… you know sometimes you make a call and it may not be 100% necessary. They'll still attend. They never say, 'Why did you call? You needn't call us for that, you know'. You know, so they are good.*

*Researcher: Oh okay, have you ever heard from other members of staff about how they find using the services? For example, has a member of staff every gone, 'Oh 111 was rubbish yesterday'? Or…*

Activity coordinator: *Erm no no, when I've dealt with them they've been excellent, the response times.*

Researcher: *With 111?*

Activity coordinator: *Yeah, they've been very good.*

**Discussion:** The perceptions here again support the CMOC (**'**Tension for change supports uptake'), as staff are happy with the alternative services provided. This CMOC is in line with the CMOC 'Communication culture encourages trust' (pp. 193) (Zeffane et al., 2011)(Chapter 5.4). However, it is unclear whether the strong communication links and reduced resistance to change will have an impact on the future of videoconferencing, as it suggests that it may be dropped quickly in light of other services (new and previously used). This was not explored in the study as this hunch only appeared upon consolidation of the findings, and was not explored due to the home having been using videoconferencing for some time, and the system already being well integrated. This CMOC will not be amended.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to tension for change and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating | Commitment to using videoconferencing | Staff opinion of alternative services  Communication links in the home  Dissatisfaction with current status quo  Staff confidence to undertake activities in different ways; such as using technology |
| Moderating |  |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

1. **Compatibility:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. There was one related, but these were deemed to be a better fit under self-efficacy (pp.204), as the theory concerned the staff members' perceived ability to use videoconferencing. All staff believed that videoconferencing would be useful, but whether or not they felt comfortable using it was strongly related to their perceived ability.
2. **Relative Priority:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. All of the homes could see the importance of implementing videoconferencing, but having the time and resources to implement it, without taking away from routine resident care, was deemed more important. See 'Structural characteristics' (pp.184) and Culture (pp. 191, 193) for related theories.
3. **Organisational incentives & rewards:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. Staff members' intrinsic motivation to take up videoconferencing seemed to be the strongest driver: where organisational commitment was higher, staff were more committed to the outcomes of the home. The relevant theories are presented under 'Culture' and 'Leadership engagement' (see pp.189, 191, 207, 209)
4. **Goals & Feedback: Goals & feedback:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. Uptake of videoconferencing was more likely to be linked to physiological feedback when developing self-efficacy (pp.209). The relative advantage (pp.169) of the effects of the intervention are discussed in 'Intervention characteristics'.
5. **Learning climate:** This was included. See relevant theories below

**'Effective recruitment of staff, results in employees feeling valued'**

* Mechanism (resource): Videoconferencing provides a new method of healthcare, which staff may lack confidence in using.
* Context: In contexts where there are strong social links and the home is adequately or over-staffed, staff are made to feel valued by enjoyment of equal opportunities to learn in the home.
* Mechanism (reasoning): This promotes an environment for shared learning, with members supporting each other emotionally and covering each other's jobs. Staff have more time to pursue training, and managers undertake effective recruitment of committed staff.
* Outcome: This provides the space and time for staff to learn how to use videoconferencing, thus increasing use of the tool amongst staff. This makes it more likely that staff will feel valued, and that their self-efficacy in videoconferencing will be heightened, thus encouraging future use. This building up of experience will reaffirm commitment to using the tool, and it will then be promoted to others within the network

**Evidence:**

Researcher: *Oh okay, that's interesting, thank you. Okay, and how easy is it for you to get cover and things for shifts?*

Manager: *Erm no, agency usually. It were better before we went onto 12-hour shift. Now we're on 12-hour shifts, after they've done three 12-hour shifts, they've had enough, haven't they? They will sometimes pick up half a shift.*

Researcher: *And what are the links like in the home? Does everyone get on well or are there certain groups that get on well?*

Manager: *Most of them are really good. Sometimes you can get 'us and them' with night staff and day staff.*

Researcher: *Does that affect the workload at all?*

Manager: *Not really, but you can get in the morning, 'Oh night staff haven't got this person up', you know, like. But you sit day staff down and say, 'There* [are] *less night staff on. There's only one of them per corridor, there's two of you. How can you expect one person to do as much work as you two?'*

*It's just hard to get night staff, and I think… and I think just out of desperation, they just took anybody.* (Care assistant)

*You see the problem with that is that we've had a really bad batch of night staff. They've employed young girls that are just not interested. They're just here to, you know… They're not interested in looking after the residents. And of course that puts pressure on the day staff, because you've got to pick up what they haven't done. And because it's hard for them to get night staff, even though we've moaned about it, nothing seems to get done for a while. And people get depressed and stressed* *due to the extra work. And it's just recently come to a head, I think she's starting to notice now.* (Care assistant)

**Discussion:** The perceptions support the CMOC ('Effective recruitment of staff, results in employees feeling valued'),as this home appeared to have weaker social links than case study 2, with some discord between night and day staff noted. Additionally, the use of agency staff may also impact team stability and social support (Edmondson et al., 2001). There also appears to be difficulties in recruiting appropriate staff. This may be exacerbated by having fewer staff employed at the home at the time of recruitment, with recruitment based on need instead of suitability. This again supports the work of Zeffane et al. (2011), on communication and trust, and Edmondson on team stability and psychological safety (Edmondson et al., 2001, Zeffane et al., 2011) (Chapter 5.4; 'Team stability supports psychological safety', pp.184). This CMOC will remain not be amended.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to effective recruitment of staff and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating | Cover each other’s jobs  Commitment to making videoconferencing work | Strong social links  Home is over staffed  Staff feel valued  Equal opportunities to learn  Support  Time to pursue training  Space and time for staff to learn how to use videoconferencing  Staff confidence to undertake activities in different ways, such as using technology, slack resources to undertake effective recruitment |
| Moderating |  |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Senior fallibility results in carers feeling valued'**

* Mechanism (resource): Videoconferencing provides a new method of healthcare provision that requires training.
* Context: In contexts where senior members of staff admit they need assistance from care assistants, they are more likely to consider themselves valued partners through the change process.
* Mechanism (reasoning): This increases care assistants' feelings of psychological safety and makes feel better able to trial videoconferencing and build up their experience of it.
* Outcome: This will increase their self-efficacy in using the system, helping them to reaffirm their commitment to videoconferencing. Upon seeing benefits to using videoconferencing, the member of staff is likely to become an advocate for the system and promote its use to others. This will therefore increase the uptake of videoconferencing and make it more sustainable.

**Evidence:**

*Yeah, because sometimes although we know our residents… because I've worked on corridors before anyway and I've* [inaudible] *but the care assistants are hands-on every day. So, they might pick up things that we're not aware of and they might be able to… You get certain relationships. Some service users will do things for some care assistants, but not for others. You know, like I could go on and go and get someone to take a tablet and they might point blank refuse, but a care assistant could do that. They have that relationship. So, yeah, sometimes you do need the care assistants to have a bit of input and say, 'This is how we're doing it and this is what we've been doing'. They do come up with some good ideas and strategies to help.* (Team leader)

**Discussion:** This CMOC ('Senior fallibility results in carers feeling valued') was supported by the evidence. Staff in this home showed some degree of fallibility, with their need for team members' input and assistance (CFIR Research Team 2017), but not to the same extent as in case study 2, as senior members of staff sought support about residents preferences. It also appears that advocacy is a key mechanism to promoting sustainability. This CMOC feeds into the self-determination theory (Marylène et al., 2005), and is related to the theory of communication and trust described in the key theories section (Zeffane et al., 2011) (chapter 5.4). The perceptions support this CMOC and it will therefore not be amended.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to senior fallibility and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating | Commitment to videoconferencing | Senior members of staff admit they need assistance from care assistants  Care assistants are more likely to feel valued partners through the change process  Perceived ability in trialling videoconferencing  Staff confidence to undertake activities in different ways, such as using technology, observing benefits of videoconferencing  Advocates for videoconferencing |
| Moderating |  |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Empowerment supports use'**

* Mechanism (resource): Videoconferencing is a new method of healthcare delivery that requires commitment from the care home staff to optimise usage and ensure optimal benefit for staff and residents.
* Context: In contexts where staff feel empowered by systemic factors (e.g., strong social connections) ('Team stability supports psychological safety', pp. 184; 'Communication culture encourages trust',pp.193), from inside or outside of the organisation, through peers or links with the remote site ('Unequal relationships hinder use', pp.180) or through employment related structures (e.g., opportunities, resources and support ) ('Culture supports commitment and self-efficacy', pp. 191; 'Size supports dissemination of information', pp. 186; 'Effective recruitment of staff, results in employees feeling valued', pp. 199), they are more likely to have higher self- efficacy in meeting the needs of residents, resulting in increased organisational commitment and increased job satisfaction.
* Mechanism (reasoning): This will improve the effectiveness of the staff’s work as there will be increased respect and cooperation. This is likely to make staff more proactive in helping the care home achieve its goals.
* Outcome: They will increase their commitment to effectively implementing videoconferencing as they support each other in using it, if they see this as a means of increasing the home's performance. Staff will gain more experience through formal or informal training, increasing uptake and sustainability.

**Evidence:**

Manager: *I don't know. A few years ago, they got rid of senior care, but I think that was a bad idea.*

Researcher: *How come?*

Manager: *Because the senior care are the next team leaders. They had a little bit more responsibility. So, what we've started doing now is the* [redacted] *programme. So, anybody who wants to be a team leader, we spend some time going through the team leader role with them so we have additional time spent on them to learn that. So, we were struggling then to get team leaders because we got rid of senior care, there were no stepping stone. So, it were like care to team leaders, and it's a big jump.*

Researcher: *And what are the links like in the home? Does everyone get on well or are there certain groups that get on well?*

Manager: *Most of them are really good. Sometimes you can get 'us and them' with night staff and day staff.*

Researcher: *Does that affect the workload at all?*

Manager: *Not really, but you can get in the morning, 'Oh night staff haven't got this person up', you know like. But you sit day staff down and say, 'There* [are] *less night staff on, there's only one of them per corridor. There's two of you. How can you expect one person to do as much work as you two?'*

*Yeah, in my erm… yeah, my daughter's pregnant at the moment and she had a bit of a do during the night. My wife was at work and my daughter phoned her. And she was like, 'Right I'm coming home', and she phoned the duty manager up to tell her what was happening. The duty manager was here within five minutes.* (Care assistant)

*Yeah, well, the staff will talk to each other on Facebook, but very discretely. We don't mention anything about the resident or anything like that, just put things like, 'Crap day today at work', you know. But most of the staff know each other really well. We go out after work together and drink sometimes, you know.* (Care assistant)

Researcher: *Okay, and you said earlier that your nan was here. Did that have any influence on you getting the job here?*

*I wanted to be in care and I were doing home care, but I didn't stick at it because I didn't like it. And I brought my Nanan in here, and then, erm… and then I filled out an application form, and a few months later they gave me an interview.* (Care assistant)

**Discussion:** This CMOC (**'**Empowerment supports use')was supported by the evidence. Although staff members mentioned that they got on well, and some links were evident as staff were related to residents and each other, there was also some discord between the staff, which may affect their commitment and feelings of empowerment. This is particularly so, as it appears that development opportunities have also been cut, with the removal of the senior care assistant's position which had been seen as a stepping stone for junior members of staff. This is in agreement with the previously proposed CMOC, so it will not be amended. This is also very similar to an earlier CMOC ('Culture supports commitment and self-efficacy', pp. 191), albeit the relationship seems to work the other way around, with self-efficacy resulting in commitment and satisfaction, rather than commitment and satisfaction leading to self-efficacy (Schonfeld et al., 2017). This again links in to Zeffane et al. (2011) on communication and trust, as empowerment is achieved through social links (systemic power), and Rosabeth's theory of empowerment (Chapter 5.4) (Laschinger et al., 2001, Zeffane et al., 2011).

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to empowerment and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Staff empowerment through good working relationships, opportunities, and support.  Formal or informal training  Staff self-efficacy in fulfilling caring roles  Job satisfaction  Organisational commitment |
| Moderating |  |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

1. **Readiness for implementation**
2. **Leadership engagement**

The following three theories were initially clustered into one CMOC. However, they have since been refined and, as far as possible, detangled.

'Managerial autonomy supports commitment and identification with the organisation.' **(NEW)**

(This CMOC was originally aggregated as part of 'Managerial autonomy supports advocacy' and 'Culture supports commitment and self-efficacy' in the Case Study 2 results, under 'Leadership, culture and identification with the organisation'.)

* Mechanism (resource): Videoconferencing provides a new and innovative method of healthcare provision.
* Context: In contexts where a manager has been in the role for a long time, and has a high level of autonomy, employees have a stronger identification with the organisation.
* Mechanism (reasoning): This means staff are more likely to work well together, have greater job satisfaction, and evidence greater commitment to developing their self-efficacy in videoconferencing.
* Outcome: They will therefore use the tool more, and develop their experience, and then pass on their knowledge to others. Others will go through the same process in turn, making the adoption of videoconferencing more sustainable.

**Evidence:**

*Right, I've worked for* [redacted] *for 17 years. I started as a domestic and I've worked up the ranks and have been managing now for the past three years.* (Manager)

*Well I think* [redacted] *is quite open to new things and moving things on, and she's only been manager for what, 18 months, two years, and she's done a lot to the home, compared to what it was*. (Activity coordinator)

*Erm not really. That's it really. I mean management know the capability of every member of staff and they do tend to task people accordingly like. So* [redacted] *and myself, they know we're a good team and* [inaudible] (Care assistant)

**Discussion:** This CMOC ('Managerial autonomy supports commitment and identification with the organisation') was separated so as to make the links between the individual components clearer. On assessing the data further, it appeared that there was a link between the length of time the manager had been in place, and autonomy, and employees' identification with the organisation. This may support the work of Avolio et al. (2004), which proposes that authentic leaders (Please see section 5.4) improve job satisfaction and foster trust, thus increasing the organisational commitment of employees.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to managerial autonomy and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Managerial autonomy  Job satisfaction  Staff identification with the organisation  Employees work together effectively  Staff advocate for the system  Care home culture  Staff working better together |
| Moderating | Length of time manager has been in post |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Managerial autonomy supports advocacy'**

(This was originally aggregated as part of 'Managerial autonomy supports commitment and identification with the organisation' and 'Culture supports commitment and self-efficacy' in the Case Study 2 results, under 'Leadership, culture and identification with the organisation'.)

* Mechanism (resource): Videoconferencing provides a new and innovative method of healthcare provision.
* Context: In contexts where the manager has been in the role for a long time and has a high level of autonomy, employees will have a stronger identification with the organisation.
* Mechanisms (reasoning): Here, they are more likely to use the system, and thus see the benefits of the system, and so become advocates.
* Outcome: Staff will pass on their knowledge to others, who will then go through the same process of observing the benefits of videoconferencing, making the adoption of videoconferencing more sustainable.

**Evidence:**

*I think sometimes because you're a bit unsure as to when to ring 111 and stuff like that, because we're not nurses and we're not doctors. We're care assistants and we're not medically trained. So, sometimes you do sit back and think: do I get a GP? Don't I? You sometimes feel a bit of a nuisance, but then you speak with your other team leaders and think: right, we do need to ring and get some advice. So, it would be nice to have that and not feel like you're being a pain in the backside.* (Team leader)

*I think that would be a good thing for team leaders, because they're more of a 'first point' if anything goes wrong. Like if they need back up, they're in more of a position to access the service.* (Activity coordinator)

*We have district nurses, erm… We have different people coming in and out, but all the time.* (Care assistant)

Researcher: *Do you have podiatrists and things like that? Like regular community services?*

Care assistant: *I'm not sure, with me just coming onto days. At night, you don't see who comes in and I've only recently come onto days, so I'm not sure.*

**Discussion:** This CMOC ('Managerial autonomy supports advocacy') was supported by the evidence. As discussed in the previous two CMOCs, where a manager has been in the role for a long time and has high autonomy, this is likely to encourage identification and commitment to the organisation, which has benefits for uptake and sustainability of videoconferencing. There will be greater team stability and psychological safety if the staff turnover is low, and so staff will feel more able to use the system and develop a transactive memory (Edmondson et al., 2001) (chapter 5.4). In addition, they are more likely to observe the relative advantage of videoconferencing over other services from past experience, and so advocate for the system more. This will again go into a feedback loop, whereby observing positive or negative differences in using videoconferencing will enhance or hinder uptake and sustainability of the system ('Team stability supports psychological safety', pp.184).

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to advocacy and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating | Staff commitment to developing their self- efficacy staff confidence to undertake activities in different ways; such as using technology | Managerial autonomy  Job satisfaction  Staff identification with the organisation  Employees work together effectively  See the benefits of repeatedly using the system  Staff advocate for the system  Care home culture |
| Moderating | Managerial experience |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

1. **Available Resources:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. However, some theories were developed that were relevant to this theme. For example, time to learn was seen as being influenced more by the structure and how many staff members were employed. The availability of information and training was linked to the ratio of senior members of staff vs. care assistants, so again this has been outlined under structural characteristics (pp.184).
2. **Access to Knowledge & Information:** This was included. Please see relevant theory below.

**'Lack of information about videoconferencing, hinders uptake' (NEW)**

* Mechanism (resource): Videoconferencing is a new method of healthcare delivery.
* Context: In contexts where staff do not have information readily available to them about the use and implementation of videoconferencing, they will be less likely to know about the system.
* Mechanism (reasoning): This will result in staff being unable to review the information and make informed decisions about whether or not it is worth trialling.
* Outcome: This means the home will not have the opportunity to observe the pros and cons of the system before deciding whether or not to install it.

**Evidence:**

Researcher: *Okay, so, what knowledge do you have of videoconferencing before this?*

Manager: *Er none. None at all, until you told me about it.*

Researcher: *And how do you think it would be trying to learn a new task in the home? Just because I went to one home and they said they didn't really have the time to learn how to use it, and I just wondered, how do you think this home would take to it?*

Manager: *We'd be all right, yeah.*

Researcher: *Do you have like the time and the resources to put into it?*

Manager: *Yeah, we'd have to plan. We'd have to plan it. We'd have to put people on training sessions.*

Researcher: *And would you have any concerns about it? Like signal or…*

Manager: *No, it's got to be a plus, hasn't it?*

Researcher: *Okay, and what is your knowledge of using videoconferencing in care homes? Have you ever heard of it before?*

Care Assistant: *No, that's the first time I've heard of it.*

Researcher: *And would you have any hesitations about using it?*

Care Assistant: *No, it would be good, yeah.*

**Discussion:** This theory ('Lack of information about videoconferencing hinders uptake')emerged only in the final home, when discussing the intervention with the manager. Although it emerged in only one home, it could be integral to an understanding of why some homes are not taking up videoconferencing. This theory could be in part explained by Rosabeth's theory of empowerment (Chapter 5.4.1), as it outlines the need for access to information, strong links outside the organisation, and access to training in order to feel empowered (Laschinger et al., 2001).

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to availability of information and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Information readily available about the use of videoconferencing  Knowledge of videoconferencing  Opportunity to observe videoconferencing |
| Moderating |  |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

* + 1. Characteristics of individuals

1. **Knowledge & beliefs about the intervention:** There were theories related to this theme, but again, they seemed to be a better fit for other themes. For example, dissemination of knowledge and beliefs/managerial influence was linked to structural characteristics, and the home having a flatter hierarchical structure. Knowledge was more closely associated with time, training, and communication, which are better addressed under culture (pp.191, 193) and structural characteristics (pp.184). See these sections for relevant theories.
2. **Self-efficacy (perceived capability):** There were several theories on self-efficacy. See below

**'Low confidence hinders uptake'**

* Mechanism (resource): Videoconferencing provides the opportunity to consult with a remote member of nursing staff.
* Context: In contexts where staff have less experience in managing resident health, they may be less confident in calling the hub, due to there being less psychological safety.
* Mechanisms (reasoning): This means that staff who are less experienced in caring for residents will be less likely to access videoconferencing without the support of someone in a more senior post.
* Outcome: The more seniors there are employed at the home, the more likely it is that videoconferencing will be used, and the greater the chance that the home will see a positive impact and that this will be observed by less senior members of staff.

**Evidence:**

Activity coordinator: *I think that would be a good thing for team leaders, because they're more of a first point if anything goes wrong. Like if they need back up, they're in more of a position to access the service.*

Researcher: *Oh because of the responsibility?*

Activity coordinator: *Yeah, I can't see a care assistant particularly being confident to use it.*

Researcher: *Erm is that, do you think, because of the type of technology or because of not knowing what healthcare pathway to access?*

Activity coordinator: *Yeah, because team leaders are much higher trained than what the care assistants are as well.*

Researcher: *Do you think that would be more about using the technical equipment or more about, I'm not sure if this is the right thing that I should be doing?*

Care Assistant: *Am I doing right thing.*

Researcher: *So, more about, is this the right option for the resident?*

Care Assistant: *Yeah.*

**Discussion:** This CMOC (**'**Low confidence hinders uptake')again appeared to be supported, with care assistants saying that they would lack the confidence to decide whether or not to access the service, and that there were few senior members of staff to request advice from, as there are just three team leaders employed at the home. This links into the theory of self-efficacy, as verbal encouragement and vicarious experience are key to achieving self-efficacy in a given task (Schonfeld et al., 2017) discussed in Chapter 5.4. This was evident in the difficulty the researcher encountered when trying to interview a team leader. The manager assisted by creating time for the researcher to interview a team leader; however, this was still ultimately only possible for approximately 5-10 minutes. This CMOC is similar to 'Psychological safety supports use' (pp.182), albeit working in the other way until staff have established whether or not videoconferencing is psychologically safe, with support from senior staff. This CMOC will therefore not be amended.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to low confidence and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Staff experience in managing resident’s health  Staff confidence to undertake activities in different ways; such as using technology, ratio of senior care assistants to care assistants  See the benefits of using videoconferencing |
| Moderating |  |  |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Previous experience using technology encourages self-efficacy in dealing with technical problems'**

(This CMOC was originally aggregated as part of 'Technical difficulties could endanger uptake' in the Case Study 2 results.)

* Mechanism (resource): Videoconferencing provides a means by which residents can be seen in the privacy of their own homes.
* Context: In contexts where a signal is weak within the care home, residents may have varying levels of privacy; for example, if the signal is only available in public areas and is poorer in residents' bedrooms.
* Mechanism (reasoning): Where staff have had previous experience of using similar technologies, they may feel better able to find a solution to the problem. Depending on whether or not they find a solution, this will either heighten or decrease the level of self-efficacy in videoconferencing.
* Outcome: If self-efficacy is lowered, it is more likely that staff will revert to longstanding practices and routines. However, if self-efficacy is raised, due to finding a solution, commitment to using videoconferencing will be increased. This will encourage staff to heighten or maintain their effort and commitment to making videoconferencing work, meaning they are more likely to seek out new ways to expand the use of videoconferencing to help meet the needs of the residents, as well as promoting the use of videoconferencing to others

**Evidence:**

Activity coordinator: *We've got a lot of more younger staff here. So, with it being technology, they'd probably get a better grasp. Wouldn't be scared of things like* [inaudible]

Researcher: *Do you think that's because… Do you have experience with using technology like Skype and that?*

Activity coordinator: *No, I've never used it, no.*

Researcher: *Okay, so, do you think it's perhaps that maybe they have?*

Activity coordinator: *Perhaps if they were brought up with it, I mean I've not.*

Manager: *There are a few staff that are really scared of computers and because we do e-learning and they're like, 'I can't do it, I can't do it', and I'm like, 'Yeah, you can, you just click. It's so easy'. And once they've been on it… So, I think it's that initial, 'oh God, I can't do it'. The young ones are like, 'Deh deh deh', you know? It's the older end, the older end. We've got one who's 67, on nights, and she's like, 'Oh I don't know, I don't know'. I think it's just fear a little bit with them. So, I think we might have a little bit, 'Oh no, I can't I can't'*

Researcher: *And do you think the younger ones take to it more perhaps because they've been exposed to it more?*

Manager: *Yeah, yeah.*

**Discussion:** This CMOC was previously aggregated with self-efficacy using videoconferencing, but has been refined and separated so as to help clarify outcome patterns. Initially the CMOC (**'**Previous experience using technology encourages self-efficacy in dealing with technical problems')stated that, 'Depending on whether or not the member of staff is able to find a solution to this problem, this may heighten or decrease the level of self-efficacy'. However, it became clear that being able to find a solution to the problem is more likely to be linked to previous experience of using videoconferencing. This links into the theory of self-efficacy, as previous experience is a key part of achieving self-efficacy in a given task (Schonfeld et al., 2017) (please refer back to 5.4). This CMOC was therefore expanded to include the detail underlined. In addition, this joined a feedback loop of the outcome of videoconferencing either encouraging uptake and sustainability or hindering it. If there are technical difficulties that endanger or build confidence ('Technical difficulties could endanger uptake', pp.176; 'Packaging can affect use', pp.178).

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to previous experience using technology and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating | Outcome from the call  Commitment to making intervention work | Staff’s perceived ability to be able to deal with technical problems  Staff’s actual ability to deal with technical problems  Self-efficacy in using videoconferencing |
| Moderating | Staff’s previous experience with technology | Strength of internet connection |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

**'Support to encourage use and increase self-efficacy and autonomy'**

* Mechanism (resource): Videoconferencing provides support when required, which can be out-of-hours, for residents in care homes.
* Context: In contexts where the staff members feel unsure of how to meet a resident's needs, they may be more inclined to seek out support from a member of staff with knowledge of the resident and more experience in managing resident care.
* Mechanism (reasoning): This will make it more likely that the staff member will call an off-duty member of staff before the hub to clarify a resident's behaviour. As their self-efficacy grows through time and training, knowing when to use videoconferencing to manage a resident's needs will become less daunting, making it more likely that staff will use it without checking first and that the perceived ease of use of the system will increase, along with their self-efficacy.
* Outcome: This will result in staff commitment to using videoconferencing in the future being heightened

**Evidence:**

*Like if there's something up with one of our residents, then we'll go to our team leader that's on and say. Then they'll come and look and then they'll decide which step to take.* (Care assistant)

*Care assistant: Yeah, I find it fine. I'm used to being on my own at nights, because I know the residents as well. You get to know the residents and talk to them and see what they want.*

Researcher: *Does that kind of knowledge help you know which healthcare pathway to access?*

Care Assistant: *Yeah.*

Researcher: *Because I guess you'd know what's suitable for someone and what's not?*

Care Assistant: *Yeah like what's right for one person might not be right for someone else.*

*Yeah... I think it is staff confidence, particularly with night staff because we don't have any seniors on nights, although the longer they're here the more confident they get obviously. So, some of us night staff are really confident and wouldn't need any assistance, but some of us newer staff, it would be able to benefit them. Just to get a little bit of advice. Plus, it's like things with head wounds [redacted] they bleed so bad, but they're not so bad when you clean them up, but it looks worse than what it is sometimes and I think it's that as well.* (Manager)

*No, they do it, or they'll ring team leader from their unit because their numbers are in as well. So* [redacted] *deputy tends to get the brunt of phone calls from the team leaders and from care assistants, because if team leaders are unsure they'll either ring, because my numbers in there… We'll always say, 'If you're not sure, ring me or ring* [redacted]*'.* (Manager)

**Discussion:** This CMOC (**'**Support to encourage use and increase self-efficacy and autonomy')again links into the theory of self-efficacy because previous experience, vicarious experience, and verbal persuasion are key to achieving self-efficacy in a given task (Schonfeld et al., 2017) (please refer back to 5.4). The perceptions again seemed to support the developed CMOC, so it will remain unchanged. This again links with the CMOC on communication and trust (Chapter 5.4) (Zeffane et al., 2011).

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to support and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Support from experienced staff (senior staff – care assistant ratio)  Training  Staff confidence to undertake activities in different ways; such as using technology  Self-efficacy in meeting resident’s needs |
| Moderating |  | Time/ experience |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

1. **Individual stage of change:** Theories related to this have been developedin the self-efficacy section (pp.204). However, stages of change could not be explained by self-efficacy and so this theme was not included.
2. **Individual identification with the organisation:** Commitment to the organisation arose as an important factor. However, this was included under culture as this was deemed to be the driving mechanism behind fostering organisational commitment.
3. **Other personal attributes:** Here, there were some individual characteristics that were seen to influence use, but these were deemed to be more suitable to develop in other sections of the framework. For example, having increased confidence by communicating with remote healthcare professionals over video where English was not the carer's first language was developed under the 'relative advantage' construct (pp.169).
   * 1. Process
4. **Planning:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. No participants mentioned it despite the planning of the intervention being different in each home.
5. **Engaging:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. Staff varied in their level of engagement, but this was due to the amount of time available for training and for staff to model the system in use. Related theories were included in 'Structural characteristics' (pp.184) and culture (pp.191, 193).
6. **Opinion leaders:**

**'Opinion leader advocacy supports uptake' (NEW)**

* Mechanism (resource): Videoconferencing is a new method of healthcare delivery.
* Context: This is in contexts where the staff members act as informal or formal opinion leaders of videoconferencing, sharing their view of the system.
* Mechanism (reasoning): It is more likely that a more homogenous environment will develop in which the influence and advocacy of the leaders is disseminated throughout the team, and so barriers to implementation will be reduced.
* Outcome: This will result in more members of staff trialling the system and developing their self-efficacy, which will increase uptake and sustainability.

**Evidence:**

Activity coordinator: *Well, I think* [redacted] *is quite open to new things and moving things on, and she's only been manager for what, 18 months, 2 years, and she's done a lot to the home, compared to what it was.*

Researcher: *Okay, what's changed?*

Activity coordinator: *The presentation, the decoration, upgrading and everything, all sorts to try to bring it up-to-date a bit. There's a long way to go, but we'll get there. You know with budgets and things but she's definitely committed to* [redacted]

Researcher: *Do you think with more encouragement over time?*

Manager: *Oh yeah, because they have to do e-learning and we've got them all on that now. It's really easy and basic, but if screen goes blank or owt they're like, 'Oh no, what have I done!'*

*Well, the good thing is it would cut out, obviously with the hub with these type of homes, people aren't medically trained and that, but you can recognise things, you know, these people that… well, that you can recognise things and it's whether you need to push, like I say, whether you need to ring help or not; whereas if you had some sort of advice and say, 'Look, this has happened to this person, what do you think we need to do?' That side of it might be good.* (Care assistant)

**Discussion:** This CMOC (**'**Opinion leader advocacy supports uptake') was not originally included because the theories relating to opinion leaders were included under organisational structure and culture, as it was considered that opinion leaders were more likely to spread their influence through flatter hierarchical structures, sizes, and communication cultures in the care home ('Structural characteristics', pp.186,189, 193). However, upon reflection on the data, it was clear there were already opinion leaders in place prior to implementation and this would have had an initial driving effect to get others involved (Avolio et al., 2004). The evidence above shows the influence opinions may have on staff. There is one care assistant who would be classed as a more informal opinion leader, and a manager who would be a more formal opinion leader who has previously had success in implementing change.

**Mediating and moderating factors:**

Table shows a breakdown of mediating and moderating factors relating to opinion leaders and uptake/ sustainability

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | Mediating |  | Level of communication in the home  Opinions of service  Hierarchical structure |
| Moderating |  | Size of the home |
|  |  | Low impact | High impact |
|  |  | Impact on outcome | |

1. **Formally appointed internal implementation leaders:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. This is because no respondents mentioned being formally appointed implementation leaders, other than the manager. Again, this was covered in the sections mentioned above, as there were more pertinent factors influencing staff opinion and disseminating information. These were organisational structure and communication culture (pp.193).
2. **Champions:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. This is because no champions appeared to be employed at the homes included in the study.
3. **External change agents:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. One of the case studies was able to feed back to the hub indirectly through the CCG, as they were taking part in a trial. They said that this was useful, but it did not come up as an important factor in implementation, especially as the home still struggled to optimise the use of it and so it was ultimately discontinued.
4. **Executing:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. The homes spoken to did not appear to have a clear plan of how to implement the system and appeared to just implement it at their own pace.
5. **Reflecting & evaluating:** This sub-construct of the CFIR was not reported in the findings as it was not identified as a pertinent theme. There appeared to be evaluation for just one care home at the CCG meeting. This meeting was not inclusive of all the care home's staff, and the feedback to the manager was informal. In Case Study 2, there was no feedback or meetings. The home informally discussed things in its networks, and observed effects, whilst encouraging shared learning. Therefore, these theories were deemed a better fit in 'care home culture' (pp.191, 193) and 'relative advantage' (pp.169).
   1. Summary

The key mechanisms that appeared prominent thoughout were as follows: self-efficacy (verbal persuasion/support); experiences of using the system (speed, technical difficulties, ease of setting up); opportunities to trial the system (trialability/opportunities for training); psychological safety (unequal relationships, team stability); culture (trust, shared learning, communication); previous experiences of using technology; advocacy/opinion leaders; confidence (in communicating, in meeting resident needs, and using the system); staff sense of empowerment (through information, training, and social links in the home); managerial autonomy; staff feeling valued (through effective staff recruitment, and senior members admitting fallibility); identification with the organisation; tension for change; and structural characteristics (size of the organisation, skill set of staff).

However, all of these factors fed into the feedback loop presented below (Figure 23). The feedback loop demonstrates how prior behaviour and experience can influence self-efficacy and intention to use, and how subsequent patterns of use then modify experiences and in turn alter intentions to use. This feedback loop can positively or negatively influence uptake, depending on experiences.

Self-efficacy/

Self -determination

Belief/ attitudes

Behaviour

Intention to use

* Commitment to the organisation
* Job satisfaction
* Perceived ability to undertake task/ competence
* Perceived ability to affect change
* Belief in videoconferencing’s ability to improve care home outcomes
* Autonomy
* Gain experience (vicarious/ trial system)
* Resources/ availability to undertake training
* Advocate for system
* Share learning
* Team work

Results/ outcome

* Physiological Feedback
* Performance outcomes
* Observe relative advantage over other services
* Psychological safety
* Share learning with others
* Motivation/ commitment to intervention/ advocates
* Uptake/ sustainability
* Attitude shift
* Social links (communication/ trust)
* Opportunities to learn
* Authenticity of leadership
* Care home culture
* Team stability
* Structural characteristics
* Empowerment
* Advocates

Environmental and Social

Figure 23 Adapted from Rutledge, pp. (2012) Self-efficacy Loop (Rutledge, 2012) to include theories linked to uptake and sustainability of videoconferencing

* 1. Feedback from the readiness assessment report

To consolidate the findings, a readiness assessment report was created (in the form of a report for Clinical Commissioning Groups) and sent to the managers of the participating care homes. This put forward a range of recommendations extrapolated from the findings to enable commissioners and strategic managers to assess the readiness of a care home to receive videoconferencing (Appendix 9).

The manager of Care Home 3 responded to this, stating that she agreed with the contents of the report and all of the comments attributed to the CMOCs in the report. However, she made an additional comment that it would be difficult for residents with dementia to use the system. This had only been raised once before, by a senior care assistant who took part in Case Study 2. She stated that,

*Sometimes they'll say 'oh bugger off' or summat, but they don't really mean, 'No no stop it'. We'll just sort of move it out the way. Like one-woman sort of like turned it towards me because she didn't want it to look at her, but she were all right holding my hand whilst I was talking to it. But she just wasn't interested, she just wanted to hold my hand*.

However, this was only raised once so was not considered to be a pertinent factor, particularly as it appeared that her knowledge of the resident meant that she knew how to respond to the resident's dislike of the system. This is encompassed by the CMOC on self-efficacy and managing resident care, as where staff have greater self-efficacy in managing resident care, they have greater self-efficacy in using videoconferencing (the self-efficacy theories start on pp. 213). In addition, the manager had previously stated,

*They don't react well, like in A&E, with people they don't know. So, with that sort of aspect to it, and with you doing most of the talking because obviously they won't interact with it, it does help a lot instead of getting the resident upset because of having to take them out and not all of the time will they let a GP see them if we get a GP out*.

This issue, therefore, was evidently not limited to videoconferencing, and the carer stated that it worked best with residents with dementia, for this reason.

The manager of Care Home 3 stated that because they had not seen videoconferencing in use, it was hard to say, and so for this reason, and given previous data collected from case study 2, the readiness assessment was not amended.

The manager of case study 2 also responded, but stated that they would like it to be made clearer in the report that videoconferencing would be a benefit, but that nurses may see less benefit from it because they were already medically trained. This was covered in the CMOC on 'Untrained staff support use' (pp. 188). However, it was made clearer in the report.

The manager of Care Home 3 was not contactable to ask for feedback as they had since left the company.

* 1. Discussion

As a comparative case study approach was used, the emergent theories in each case study appeared quite dissimilar. This was due to the iterative process and theory refinement that had happened at each stage. The findings also reflected the relative priority of the theories in each home (Chapter 6.4).

The original organisational theory (Chapter 5.2) was shown to be true (Weiner, 2009), with the proposed programme theories falling under the umbrella of 'change commitment' or 'change efficacy'. Where there was a homogenous environment, and where all team members felt committed to the goals of the organisation and thus wanted to implement videoconferencing, uptake and sustainability of videoconferencing increased. The organisation had a strong commitment to change. Where the staff in the home had high change efficacy, they perceived themselves to be capable of using the technology and meeting the needs of residents through the service, and their ability to affect change was higher. This again increased sustainability and uptake. Where staff had a high level of organisational commitment that was intrinsically motivated, the home's ability to affect change was also increased.

When the care homes were more heterogeneous in their views of videoconferencing and the alternative services, there were varying levels of commitment and perceived levels of ability to affect change. For example, when self-efficacy in using the technology and shared learning between the staff were low, then the uptake and sustainability of videoconferencing was negatively affected.

The findings and programme theories presented and refined from the study on change commitment and change efficacy are explored in more detail below.

* + 1. Change commitment

Change commitment asks: do members value the change? Factors that could affect this include how urgent staff members believe the change is (Weiner, 2009). This is supported by CMOCs such as 'Tension for change' (pp.196), which was highlighted as essential to the uptake and use of the service. Additionally, where there are strong communication links within the home, this helped to build dissatisfaction with the current status quo and reduce barriers to implementation (pp. 193). Staff may also value change if they believe that it can solve problems the organisation faces (Weiner, 2009). For example, 'Faster response supports uptake' (pp.169).

Other factors could include the perceived benefits for the organisation and those within it (Weiner, 2009); for example, 'Low confidence in communication encourages uptake' (pp.171), where it has been shown to provide support for those whose first language is not English. Staff might also value it when managers or peers are known to do so (Weiner, 2009). This is supported by 'Managerial autonomy supports commitment and identification with the organisation' (pp.207), whereby if the manager supports the change, staff will also commit to implementing the system, if they have a strong identification with the organisation.

Key factors associated with change commitment and related to how the intervention is designed, or its characteristics, included staff being able to observe the benefits of using the system. For example, 'Low confidence in communication encourages uptake' (pp.171). This relates to a carer's ability to deliver appropriate care for residents. Other CMOCs were related to the quality of the equipment, such as: 'Technical difficulties could endanger uptake' (pp.176) and, 'Packaging can affect use' (pp. 178).

In the outer setting of the home, staff were reluctant to use videoconferencing if they considered themselves to be unequal partners in the exchange process ('Unequal relationships hinder use', pp.180). However, if they had a high level of psychological safety using the system, they were more likely to choose the hub over services where their experiences have been less positive ('Psychological safety supports use', pp.182).

Inner characteristics that could affect change commitment include the level of medical training amongst staff. Care assistants were more likely to call for a range of reasons and were likely to be willing to persist with the call, even if there was a wait for a response from the hub ('Untrained carers support use', pp.188). This differs from homes where staff have a higher level of medical training, and have residents in greater ill health who may deteriorate faster. This affected their willingness to wait for a response from the hub. This suggests that care homes that are staffed with onsite nurses may see less perceived benefit from the service than residential homes, which would affect change commitment. When the professional at the remote site has a similar level of training to the on-site nurse, the nurse may not see adequate benefits for the home and those within it, as they already know the service(s) to access and care to deliver ('Medical training hinders use', pp.189).

The main benefit of videoconferencing would be a reduction in professional isolation, particularly at night, when qualified staff often work alone. The nursing homes in this study had not optimised the use of videoconferencing during the trial conducted by the CCG. However, staff did mention that the system was of great benefit to them for supporting night staff, getting a second opinion, and having better access to healthcare at times when they had previously felt isolated from other medical professionals. Difficulties in uptake may have been due to factors such as self-efficacy in using technology (Schonfeld et al., 2017) (pp.215), high staff turnover (Goodman et al., 2017c) (pp. 184), lack of autonomy (Marylène et al., 2005) (pp. 207, 209) and poor communication links (Goodman et al., 2017c) (pp. 193), all of which inhibited their ability to successfully integrate the tool.

Leadership engagement was also key. This project found that high levels of managerial autonomy positively impacted on staff. It encouraged greater staff commitment to the organisation and greater job satisfaction, and encouraged staff to work better together ('Managerial autonomy supports commitment and identification with the organisation', pp.207), particularly when videoconferencing was seen as important to the manager, for example if they had advocated for it ('Managerial autonomy supports advocacy', pp.209).

* + 1. Change efficacy

'Change efficacy' refers to the cognitive appraisal of the organisation's ability to implement videoconferencing. This is composed of three factors: the demands of the task, availability of resources, and situational factors (Weiner, 2009).

For this, it is essential to know what is necessary to undertake the change (Weiner, 2009). This is supported by the CMOC on 'Lack of information about videoconferencing hinders uptake' (pp.211), which found that one mechanism for uptake was ready access to information about videoconferencing. When this was not available, managers were unable to make a decision about whether or not to implement the system.

Change efficacy is also related to knowledge of the task (Weiner, 2009). This could be attributed to 'Low confidence hinders uptake' (pp.213). One of the main factors influencing uptake was a member of staff's perceptions of self-efficacy in meeting the needs of residents ('Low confidence hinders uptake', pp.213). Where staff were unconfident about their knowledge of which services to access before videoconferencing was introduced, this hindered the uptake and sustainability of the system, as staff were unsure about how to incorporate it into resident care. However, this could be addressed by having more senior support in the home, and ready access to support day and night ('Support to encourage use and increase self-efficacy and autonomy', pp.218; 'Size supports dissemination of information', pp.186).

Another factor linked to knowledge of the task is, 'Previous experience in using technology encourages self-efficacy in dealing with technical problems' (pp.215) and 'Trialling videoconferencing supports uptake' (pp.174). Where staff have the opportunity to trial the system, they are able to build their experience. This is beneficial to building self-efficacy, which in turn supports uptake. The greater a member of staff's self-efficacy is in using the technology, the greater the chance they will persist when facing challenges (Akhtar, 2008) ('Previous experience in using technology encourages self-efficacy in dealing with technical problems', pp.215).

The complexity of the system was another factor affecting efficacy. If care staff could find a solution to the technical challenges they faced, change efficacy increased. The system should be easy to assemble and highly mobile ('Packaging can affect use', pp.178). This ensures the system does not add to staff time commitments, particularly when a home is under-resourced. Finally, a poor broadband signal in the care homes negatively affected change efficacy ('Technical difficulties could endanger uptake', pp.176).

Individuals should cognitively assess whether the care home has the resources, time, and human and financial availability to successfully implement the system (Weiner, 2009). This supports the CMOCs of 'Size supports dissemination of information' (pp.186), 'Support to encourage use and increase self-efficacy and autonomy' (pp.218), and 'Empowerment supports use' (pp.204). They should also consider whether or not they have sufficient time to implement the change ('Effective recruitment of staff, result sin employees feeling valued', pp.199).

6.11.3 Contextual factors that affect organisational readiness

It is suggested by Weiner (2009) that contextual factors can influence an organisation's readiness for change; for example, culture. Having a positive culture that supports learning, innovation, and risk-taking is beneficial for improving an organisation's readiness for change (Weiner, 2009). This project found that the reason for this is that homes worked better together when the manager nurtured a positive care home culture. This fostered greater commitment to the organisation by care home staff, and increased the chance of the home having a shared view of the potential for videoconferencing implementation. This is supported by 'Culture supports commitment and self-efficacy' (pp.191) and 'Effective recruitment of staff results in employees feeling valued' (pp.199).

Additionally, a positive care home culture fostered psychological safety within the care home. This made staff more willing to try the service, as they did not fear being criticised (pp.193). Psychological safety was fostered by senior members admitting their fallibility ('Senior fallibility results in carers feeling valued', pp.202) and team stability ('Team stability support psychological safety', pp.184). Psychological safety is necessary to encourage risk taking amongst members of the home (Edmondson et al., 2001).

Additionally, organisational readiness for change can be promoted by consistent messages and actions from the leader of the home, information sharing through social interaction, and previously shared experiences (Weiner, 2009). This research found that if the leader of the home encouraged a face-to-face communication culture, this supported the growth of trusting relationships (Zeffane et al., 2011). Where the manager was seen to be present to deal with concerns of staff on the floor, staff felt valued, and their belief in their ability to affect change was increased. This is supported by, 'Communication culture encourages trust' (pp.193), 'Managerial autonomy supports commitment and identification with the organisation' (pp.207), and 'Culture supports commitment and self-efficacy' (pp.191).

In this project, managers were often opinion leaders for videoconferencing, who had been in place from the start. They encouraged use and uptake, whilst creating an homogenous environment in which the organisation had a shared view and sense of purpose. This in turn reduced barriers to implementation ('Managerial autonomy supports advocacy', pp.209).

* + 1. Comparison with previous research

The researcher compared this project to the report, 'Care home readiness: a rapid review and consensus workshops on how organisational context affects care home engagement with healthcare innovation' (Goodman et al., 2017c). This work was chosen for comparison as it is recent, and synthesised a broad range of research and views from a rapid review of the literature and workshops. The paper explores how the care home context affects uptake of interventions. The main points that arose from the report were that culture and leadership were significant in improving uptake (Goodman et al., 2017c).

**Leadership**

The report stated that 13 homes had identified the importance of managers being engaged in an intervention by fostering relationships (De Visschere et al., 2011, Gage et al., 2012, Stein-Parbury et al., 2015, Brodaty et al., 2014, Beeckman et al., 2013, Chami et al., 2012), or managers acting as champions (Boorsma et al., 2011, Beer et al., 2011, Colon-Emeric et al., 2013, Davison et al., 2013, Brooker et al., 2016). One paper argued that for the change to take place, the manager should be present at the resident level of care (Blekken et al., 2015). This allowed trained managers to positively influence staff in a way that increased uptake as part of the study, though the paper acknowledged that managers are not often involved in direct resident care (Blekken et al., 2015). This supports the findings of this project on the importance of leadership; for example, 'Managerial autonomy supports advocacy' (pp.209). The leadership of the home and its importance for encouraging champions is clearly highlighted. However, this project builds on the reasons put forward for increased uptake when managers are present at the level of resident care. As identified, the reason for improved relationships within the home was the increased amount of face-to-face communication that occurs when the manager is present at this level, and in fact this is what fosters trust and improves working relationships ('Communication culture encourages trust', pp.193).

These findings are supported by a recent report which suggests that leadership is directly linked to organisational identity and culture within the care home (Orellana et al., 2017).

**Culture**

This thesis proposes that a positive care home culture can aid the successful implementation of an intervention. This is supported by the findings of Goodman et al. (2017), which suggests that the primary determining factor for a positive work culture is increased levels of informal and formal training (professional development). Four further papers address this (Agar et al., 2015, Brodaty et al., 2014, Beeckman et al., 2013, Colon-Emeric et al., 2006). This supports the CMOCs of, 'Culture supports commitment and self-efficacy' (pp.191) and 'Empowerment supports use' (pp.204). These CMOCs expand on this idea by suggesting a positive culture increases shared/informal learning, which helps staff to develop their self-efficacy in a task, further increasing job satisfaction and organisational commitment.

The report also suggests that uptake was increased when the intervention was acceptable to all stakeholders, and there were opportunities for ongoing discussions with staff (Gage et al., 2012, Boyd et al., 2014, Greenspan et al., 2012, Close et al., 2013). This is supported by the findings of this project. Although the homes in Case Studies 1 & 2 incorporated the technology to different extents, the home in Case Study 2 was using the system for a broader range of reasons. In Case Study 2, where the home had sustained the use of videoconferencing, the manager had promoted a culture of communication. The CMOC 'Communication culture encourages trust' (pp.193) draws on the importance of managers listening to staff to enable them to have a say in what happens in the organisation. This increases staff perception of their value to the organisation.

Goodman et al., (2017c) also found that the intervention appearing judgemental and suggesting that the care home needs to change could negatively impact on uptake. However, this did not emerge as a finding in this project either (Goodman et al., 2017c). Homes had chosen to implement the system, and therefore had opted for, or requested it. However, the survey (Chapter 4) found that one of the main reasons for not implementing videoconferencing was that the home already had adequate access to services. There may therefore be some worry about videoconferencing appearing judgemental to remote healthcare providers who service the care home, if it appeared they were not receiving adequate services from providers, or if they were worried about videoconferencing replacing services that provided human contact (Nuffield Council of Bioethics, 2009). This would need to be explored further.

Goodman et al. (2017b) also found that where staff had too much or too little experience in working with remote healthcare professionals, this affected uptake (Innis and Berta, 2016, Dorsey et al., 2010, Shepherd et al., 2015, De Visschere et al., 2011). One paper discussed poor access due to geographical distance (Dorsey et al., 2010). Although geographical distance was not highlighted as a pertinent factor in this context, the notion of the level of access affecting uptake supports the findings of this study, albeit for different reasons. In this project, where the care home was perceived to have inadequate access to care, uptake and sustainability increased. This was linked to dissatisfaction with other services, such as the response rate for the out-of-hours services ('Faster response supports uptake', pp.169) . However, it was important for there to be a general dissatisfaction with the status quo in terms of the home's current access to services. Where the home lacked a shared vision of use, uptake was hindered ('Relative Advantage', pp.169; 'Tension for change supports uptake', pp.196). Fostering relationships with higher academic institutes (Innis and Berta, 2016), was not identified as a pertinent finding of this research.

**Time and resources**

The report highlights the importance of the care home having the time and resources to successfully implement the intervention (Goodman et al., 2017c). Staff turnover is a significant factor, discussed by 28 papers, which noted the importance of having staff with relevant skills and being able to introduce the intervention when resources are stretched (Dozeman et al., 2012, Hall et al., 2013, Blekken et al., 2015, Agar et al., 2015, Stern et al., 2014, Wenborn et al., 2013, De Visschere et al., 2011, Brodaty et al., 2014, Beeckman et al., 2013, Chami et al., 2012, Colon-Emeric et al., 2006, Boyd et al., 2014, Cohen-Mansfield et al., 2012, Arendts et al., 2014, Van Ness et al., 2012, Connolly et al., 2015, Brooker et al., 2016, Schnelle et al., 2002, Chi et al., 2010, Kinley et al., 2014, Rantz et al., 2012, Simpson et al., 2013, Yates et al., 2016).

This supports the findings from the project, where it was identified that the more senior carers employed, and the higher the rates of staff retention, the greater the success in implementing videoconferencing ('Size supports dissemination of information', pp.186; 'Team stability supports psychological safety', pp.184; 'Effective recruitment of staff results in employees feeling valued', pp.199). The project also identified the importance of affective organisational commitment on organisational outcomes. Staff who were motivated by relationships within the organisation – and not by money or feelings of obligation – evidenced greater commitment to the organisation. This work suggests affective commitment leads to increased team stability and work effectiveness, which improved the uptake of videoconferencing (pp.207). Affective commitment can be encouraged by empowering staff and increasing face-to-face communication within the home ('Communication encourages trust', pp.193; 'Empowerment supports use', pp.204).

**Informal and formal communication**

Although the report by Goodman et al. (2017b) suggests that few papers have addressed informal and formal interactions, it also found that where formal interactions occurred, resident outcomes were improved (Rantz et al., 2012, Colon-Emeric et al., 2006, Beeckman et al., 2013). One paper also mentioned the need for intensive training to help care staff develop confidence in managing resident care (Innis and Berta, 2016). This supports the findings of this project: that self-efficacy can be increased through shared learning and increased communication (pp.193).

The project also found that having a greater number of committed staff increased informal and formal communication, time and flexibility for additional training, and the time required to commit to implementing the intervention. In addition, informal interactions and shared learning were the most effective at improving knowledge of the intervention and its use ('Size supports dissemination of information', pp.186; 'Trialling videoconferencing supports uptake', pp.174; 'Empowerment supports use', pp.204).

**Social capital**

Goodman et al. (2017b) identified only six papers that addressed social capital, and these concerned remote service providers (Innis and Berta, 2016, Gage et al., 2012, Greenspan et al., 2012, Dorsey et al., 2010, Shepherd et al., 2015, Connolly et al., 2015). Although this study did not directly consider social capital, it did identify how relationships between staff members in the home affected the uptake of videoconferencing (see sections on time and resources, and formal and informal communication). The report by Goodman et al. (2017b) supports the findings from this project, as it also found that where the home had a better relationship with the hub (external provider), they had greater success in implementing the service ('Cosmopolitism', pp.180; 'Psychological safety supports use', pp.182). This suggests that links with external organisations can affect the uptake of interventions.

**Evaluation**

Goodman et al. (2017b) highlighted that few homes collected data on the evaluation of staff performance. This was not reported in this study, as it did not arise as a pertinent theme.

This chapter described the results from the realist evaluation and considered how these compared to previous research, and the report by Goodman et al. (2017b). The next chapter discusses the findings from the PhD overall.

Chapter 7: Discussion

The previous chapter described the findings from the case studies. This chapter highlights the research challenge that was addressed and discusses the implications of the findings, the contribution of the thesis to knowledge and the challenges of getting research into practice. It then outlines definitions of research impact and how this project aimed to achieve impact. This is followed by a discussion on how research-ready care homes can be used in research to improve participant recruitment. The strengths and weaknesses of the project are discussed along with the challenges of conducting research in care homes and the influence the researcher may have had on the findings. Finally, recommendations for policy, research, and practice are reported, before concluding.

* 1. Research challenge

An ageing population is putting increasing pressure on the care sector, as it faces challenges such as high staff turnover, constrained resources, and unequal access to healthcare. Videoconferencing has been suggested as one response to this range of problems. This project was undertaken to explore the potential of this technology (1.1).

* 1. Summary of the findings

This thesis found Weiner’s (2009) theory of organisational readiness for change to be true. That is, that the care home has to have high change efficacy and high change commitment for implementation to be successful. Twenty-four programme theories were refined using the CFIR (Appendix 9) (CFIR Research Team 2017) and found that the key contextual factors that mediated change efficacy and commitment were inner factors, with 13 theories referring to inner context. However, the key mediating variables identified were leadership, psychological safety and social links within the home as these promoted shared learning and confidence in using the technology.

* 1. Implications of findings

The background to this thesis, highlighted challenges to providing quality care in care homes (1.4). The first of these was high staff turnover which was highlighted by Unison (2016). Reasons attributed to high staff turnover were the recruitment process, employee voice, staff motivation to undertake care work, and workers autonomy and discretion (Rubery et al., 2011). This thesis supported these findings as home that had greater staff turnover, faced greater challenges implementing videoconferencing. High staff turnover was found to be attributed to reasons put forward by rubbery et al. (2011).

This thesis demonstrated the potential of videoconferencing in improving links to health care professionals and reducing professional isolation (Johnston and Jones, 2001) improving staff confidence (McGibbon et al., 2013) and improving access for those with physical disabilities (Cruickshank and Paxman, 2013). The findings also confirmed that videoconferencing can be used to assess residents before being admitted to hospital (Hex and Wright, 2015) and demonstrated the potential to improve the speed of access to primary care (NHS England, 2015, NHS England, 2016, Hall et al., 2016).

However, although videoconferencing has been suggested as one way to prevent residents dying in hospital unnecessarily (Martin et al., 2011), this research did not explore the use of videoconferencing for palliative care. However, care home staff participants who took part in the case studies did comment on the effectiveness of videoconferencing for reducing unnecessary admissions. In addition, it was suggested that technology could support the goals of the Care Act through 'empowering patients to choose the right care for them’ (Social Care Institute for Excellence, 2015). This thesis found that the care home staff and families of residents made decisions about care when it was deemed that the resident lacked capacity. This proved to be a barrier to residents making their own choice.

In terms of the negative or conflicting research relating to the use of videoconferencing presented in the earlier parts of the thesis, this project found that where the home had the necessary prerequisites, negative and null effects appeared to be diminished. This finding was commensurate with that reported by Goodman et al. (2017c) who found factors such as leadership and culture were pertinent in improving a care homes readiness for change when implementing new interventions.

This thesis found that the key factors affecting the uptake and sustainability of videoconferencing are 1) videoconferencing being seen as valuable to the organisation 2) the home having the resources to meet the demands of implementing it. These were mediated by contextual factors within the home, such as communication in the home and staff turnover.

**Do staff in the care home value the change?**

This thesis suggests that establishing whether or not staff at a care home would value videoconferencing is key (Weiner, 2009, Goodman et al., 2017c, Greenhalgh et al., 2017). This research identified that where there is a common culture of understanding, purpose, and trust, and where staff feel committed to the goals of the care home, uptake and sustainability of videoconferencing is increased (Weiner, 2009). Goodman (2016) notes the importance of there being a common sense of purpose amongst care staff to increase the uptake and sustainability of an intervention (Goodman et al., 2016). This is further supported by the work of Greenhalgh (2017), who noted the importance of the intervention having upstream value in the newly developed 'Nonadoption, Abandonment, Scale-up, Spread, and Sustainability' (NASS) framework. This framework was developed through synthesising results from a literature review, and through empirical case studies, and was designed to help evaluate and predict how successful a technology-supported health or social care program would be (Greenhalgh et al., 2017).

The findings from this project suggest that the value of videoconferencing to the care home was influenced by a perceived advantage of the service relative to other services. Key factors that affected this sense of relative advantage included whether or not videoconferencing would improve the access to and quality of healthcare a resident was already receiving (pp.169, 188, 196, 213). This was associated with access to expertise, in comparison to the skills of the staff in the care homes (pp.188, 189). This has also been identified in studies such as Gage (2012), who found that homes without on-site NHS staff were much more active when accessing health services than those with on-site nursing (Gage et al., 2012). Additionally, access to out-of-hours services was considered relevant to the decision about whether or not to use videoconferencing: where staff were dissatisfied with out-of-hours services, uptake of videoconferencing was increased (pp.169, 180, 196). This fits with the current literature, which establishes the importance of developing an intervention that is in line with care priorities to increase uptake and sustainability. For example, Goodman (2016) noted the importance of introducing interventions that support care home priorities to ensure they are enacted (Goodman et al., 2016). This is related to the importance of tension for change in uptake and sustainability of interventions (pp.196) (Greenhalgh et al., 2017)

Finally, leadership engagement and champions were invaluable in driving commitment. Brodaty (2014) concluded that managerial support could increase the effectiveness of psychosocial programmes in care homes (Brodaty et al., 2014), which supports these findings. Finally, champions were also noted as being integral to establishing an intervention in care homes, providing the necessary access to expertise and continuity of support required for uptake and sustainability (Goodman et al., 2016). In this project, champions appeared to be predominantly managers and team leaders/ nurses in the homes (pp. 80, 209, 218, 221).

**Does the care home have the necessary resources to implement videoconferencing?**

The second factor that was seen to increase the uptake and sustainability of videoconferencing was the care home’s perceived ability to implement the service (6.11.2)(Weiner, 2009). One factor that affected the care homes’ ability to implement videoconferencing was the available resources in the homes. This included staff availability (pp.184), which is supported by Stern et al. (2014), who found challenges in implementing a telemedicine intervention for pressure ulcers due to high staff turnover (Stern et al., 2014). Greenhalgh et al. (2017) highlighted the importance of organisational capacity to innovate (Greenhalgh et al., 2017).

Another factor seen to affect the care homes' ability to affect change was the number of senior staff available, with previous research highlighting the importance of leadership and having available staff with appropriate skill sets (pp. 186, 208) (Davison et al., 2013, Greenhalgh et al., 2017, Goodman et al., 2017c).

Staff training delivered within the care home was essential to increasing the uptake and sustainability of videoconferencing (pp.191, 218). Findings from this research suggest a communication culture was seen to increase trust and encourage a supportive learning climate (pp.184, 193, 191, 218). Work by Goodman at al. (2017b) also found that the more informal and formal communication that occurred between staff, the better the effect on resident outcomes (7.11.2). The success of informal training was supported by increased team stability and low staff turnover, as staff felt better able to learn how to use the system without fear of criticism, due to stronger social links in the home (pp.184, 193, 204, 218). Edmondson et al. (2001) supports this finding, suggesting that team stability results in increased psychological safety, and is necessary for the risk-taking required when implementing a new intervention and undertaking the necessary training (Edmondson et al., 2001).

**Contextual factors**

This research identified three key contextual factors supporting the care homes' readiness for change (Weiner, 2009). The first is that encouraging a communication culture in the care home will help to foster trust (pp. 193) (Zeffane et al., 2011), which is necessary to increase psychological safety (pp. 184), and encourage a positive care home culture that fosters shared learning (pp. 191) (Edmondson et al., 2001, Zeffane et al., 2011). This is also supported by the work of Colón-Emeric (2016) who found that a lack of direct communication between managers and care staff resulted in pervasive mistrust, which negatively affected the uptake and sustainability of the CONNECT trial (Colón-Emeric et al., 2016). Additionally, Anderson (2003) highlighted the importance of increased communication in management practices for improving resident outcomes (Anderson et al., 2003)(pp.193).

The second factor identified is that there needs to be greater access to information about videoconferencing. Where homes are unsure of how to incorporate videoconferencing or of its uses, they are unable to make informed decisions about trialling it (pp.80 ,pp. 211). This challenge has been addressed in 'Technology and Innovation in Care Homes: The SEHTA Review', which highlights the development of the technology-enabled care services (TECS) project, which was developed to address this (Maczka et al., 2016). (For more information see 10.3.)

Finally, being more rigorous in the recruitment of staff, and employing those who are interested in the long-term goals of the home rather than simply recruiting on a basis of need, would be beneficial for improving the uptake and sustainability of videoconferencing (Rubery et al., 2011)(pp. 199). This would increase team stability (pp.196), result in current care staff feeling more valued (pp.199), result in current care staff feeling more valued (pp. 199), and increase the psychological safety necessary for shared learning to take place (pp.184)(Edmondson et al., 2001, Laschinger et al., 2001).

This project identified that the best time to recruit is before the home is short-staffed (pp. 199). If the home has sufficient staff to call on who are highly committed to the organisation (pp.199), this will allow the manager to take their time over the selection process. This is supported by the work of Rubery (2011), who found that the recruitment process (pp.199), employee voice (pp. 193), staff motivation to undertake care work (pp.193), and worker autonomy were the factors most strongly affecting staff recruitment (pp.199)(Rubery et al., 2011). Effective recruitment of staff fosters a positive care home culture, and thus the home's ability to sustain a new intervention is improved (pp.199)(Goodman et al., 2017c).

However, Rubery (2011) suggests that another difference may be linked to recruitment strategies, as small independent providers may be more likely to recruit through informal channels, in contrast to large providers, who are more likely to put out formal advertisements. This suggests that the small providers may have more success in recruiting staff who are a more suitable fit for the organisation (Rubery et al., 2011). Although this did not appear as a finding in this research, it should be explored further as it may be a contributing factor that was not identified.

The findings suggest that, overall, videoconferencing is a viable tool as long as certain prerequisites are in place; for example, managerial and staff commitment, and champions to drive implementation.

Research.

* 1. Contribution of thesis to knowledge

This research has established that videoconferencing is under-researched (Chapter 3), despite this technology having been shown to have great potential (Chapters 4 and 7). However, there is a significant gap in research investment, which may be impeding uptake. Managers and commissioners will be unable to make informed decisions about the use of videoconferencing in care homes if there is a deficit of available evidence to draw on (NHS England, 2017). In addition, there is little information about available services on the ground with approximately 40% of care home mangers having never heard of videoconferencing for accessing health care. If care home managers are not aware of available services, this will impede uptake as they will be unable to request support for these services from commissioners. This project puts forward key recommendations in a report for commissioners and strategic managers highlighting the key contextual factors that may support or impede the uptake and sustainability of videoconferencing in the UK. For example, the care home culture, shared learning, availability of on-site nursing and communication and trust in the home were shown to support uptake. These recommendations will enable commissioners and care home managers to make more informed choices about the funding and implementation of this service in their local areas (Appendix 9).

This project has also made a methodological contribution, being the first realist evaluation undertaken to evaluate this technology in care homes. This demonstrates the potential for realist evaluation to explore how contextual factors influence the use of videoconferencing in delivering a range of outcomes through the development and refinement of theory in context. For example, it is now known to be possible to convey the basic principle of realist evaluation to staff in a busy environment and for the research to be successfully undertaken. This is a strength of realist evaluation that would not be achieved with other methods. In addition, this project demonstrates the use of interactional/conversation analysis to improve the validity of the findings. For example, where the researcher put forward summative questions to directly test a hypothesis if respondents said ‘yes’, but were then unable to expand on the reasons why they agreed, the researcher, using the principles or preferred response and recipient design, could have more confidence in excluding these responses from data analysis (Sidnell and Stivers, 2012).

* 1. Research into practice

Throughout this project, challenges were identified with getting research into practice. These are discussed below.

The literature review (Chapter 3) demonstrated that global knowledge of the use of videoconferencing in care homes is patchy and unreliable. This is due to a deficit of robust population-based studies and translational research. For example, one paper identified that mortality rate in care homes which used videoconferencing, were higher than those in homes that did not. This was attributed to inconsistency in data in the early years of observation (Hex and Wright, 2015). Additionally, the absence of theory-driven research means there is little knowledge about different outcome patterns in sustainability and uptake. With this large research gap, along with a deficit of cost-effectiveness research, it is challenging for commissioners and care home providers to make informed decisions about the use of videoconferencing in care homes (NHS England, 2017).

One way of addressing this gap in knowledge is the 'technology-enabled care services project' (TECS), developed by NHS commissioners to help raise awareness of how technology can inform commissioning and provide resident benefits (Maczka et al., 2016). When developing resources that may be of use to commissioners, early involvement with this group will ensure that outputs are developed through their tools and resources pages (NHS England, 2017). (For information on how the findings from this project were disseminated, see 8.8.1).

However, this project also found that where care home managers and commissioners did know about videoconferencing, there were still challenges to implementing the knowledge. This may be due to gaps between local practice and operationalising knowledge (Kristensen et al., 2016). Previous research has attributed this gap to processes being unsystematic and relying on just a few key stakeholders (Kristensen et al., 2016). Additionally, research based on unreliable data from local commissioning groups, in the absence of robust trials, may be impeding implementation (Garnett and Hanson, 2016). This challenge has been supported by survey respondents who indicated they 'would love to have the system', but could not, due to factors outside of their control (pp.80).

Although care staff responding to the survey stated that they had heard of videoconferencing (pp.80), there was still a deficit of knowledge, with the majority of homes stating they needed to know more before considering implementing the system (pp.80, 211). This lack of knowledge and confidence is believed to have led to a general distrust of the technology, which may be hindering uptake (4.15 pp. 91). This was supported by Greenhalgh et al (2017), who found that there were many cases where technology was not used, as there were weak social networks and limited skills in information technology, this resulted in distrust of new healthcare technology programs (Greenhalgh et al., 2017). These findings suggest that promoting the services and informing potential users of the ways in which videoconferencing can be used may encourage more homes to trial the system (pp. 80 and pp. 211).

Finally, training needs were identified. The first was a need to develop care staff competence in knowledge of which care pathways to access in which situations. The second was in the skills and confidence to use the technology.

Encouraging competence and confidence in care staff who are unsure of which care pathways to access and in which circumstances could improve uptake and sustainability of the system (pp.213) (Marylène et al., 2005, Olafsen et al., 2016, Schonfeld et al., 2017). The deficit of training and support in this area affects competence and self-efficacy of care staff (pp. 218, 193).

These factors have been linked to poor job satisfaction and high turnover (Kahn and Long, 2007, Olafsen et al., 2016, Laschinger et al., 2001)(pp. 184, 218). The provision of more support and training may increase team stability and job satisfaction, which would improve the uptake and sustainability of videoconferencing (Kahn and Long, 2007, Olafsen et al., 2016, Laschinger et al., 2001) (pp.184, 218). Low confidence in this area will affect uptake, as staff may also be in fear of criticism by remote or care home staff if the wrong action is taken (Edmondson et al., 2001) (pp. 218, 182). Without staff feeling competent in their knowledge of which care pathways to access, they will be less likely to have the confidence to trial new ways of working, which will hinder uptake (Schonfeld et al., 2017, Laschinger et al., 2001, Edmondson et al., 2001, Coates and Fossey, 2016).

For those who felt competent to manage resident care, there was also a knowledge gap linked to staff knowing how to use the technology and having the confidence to trial it, for fear of it not working (Schonfeld et al., 2017) (pp. 218). This is again an important gap to address if uptake and sustainability is to be encouraged, as experience is crucial for overcoming challenges (pp.176, 215) (Schonfeld et al., 2017, Coates and Fossey, 2016).

Throughout the project, steps were planned and undertaken in order to increase the impact of the project in different areas. The definition of impact and steps taken are presented below.

* 1. What is impact?

Impact can be understood as the benefits that different projects have for different people, and to different degrees. The Research Excellence Framework (REF) 2014 was designed to assess the extent to which researchers achieved impact with funded research, and defined impact as: 'an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia' (Higher Education Funding Council for England, 2017) (pp. 1).

Morton (2015) suggests three approaches to assessing impact. The first is forward tracking studies, which begin with the research and provide a forward trajectory for how this might influence policy or society (Morton, 2015). Backward tracking takes an analysis of a practice or change in policy, and tracks it backward to examine the impact of the research. Finally, evaluation of knowledge exchange initiatives aims to assess the impact of activities undertaken. Morton notes that forward tracking is the most commonly used method (Morton, 2015).

Greenhalgh et al. (2016) suggests that impact is complex and often difficult to measure, as knowledge is generated and used in multiple ways. In the review (2016), she suggests that different methods should be used in different circumstances. Six key frameworks are identified in the paper (Greenhalgh et al., 2016).

One framework identified by Greenhalgh et al. (2016) is 'the payback model' (Buxton and Hanney, 2008), which is said by Donovan (2016) to be internationally recognised as one of the key approaches to assessing the wider impacts of health research (Donovan, 2016, Buxton and Hanney, 2008). The framework identifies the trajectory of any project, from designing and undertaking the research to dissemination. It enables the researchers to identify the impact the work could have on society, as well as its economic benefits (Donovan and Hanney, 2017). However, it is a time-intensive and complex framework to apply (Greenhalgh et al., 2016).

Other frameworks include the Canadian Academy of Health Sciences (CAHS) framework (Canadian Academic Health Sciences, 2017), which is also time-intensive to use (Donovan and Hanney, 2017, Greenhalgh et al., 2016). There are monetisation models, such as frameworks for analysis of return-on-investment (Institute of Medicine, 2015). However, monetisation frameworks were not suitable as they require access to economic data and have too narrow a focus (Buxton et al., 2008). Societal impact assessment frameworks were highlighted as possible approaches (Greenhalgh et al., 2016). Examples include the 'social return on investment' framework (SROI) (Banke-Thomas et al., 2015). However, societal frameworks are seen as subjective and highly variable in the way in which weights are assigned to different societal impacts (Greenhalgh et al., 2016). Many researchers reject societal frameworks for fear of threats to scientific rigor (Bornmann, 2012).

There are other emerging methods of assessing the impact of research, each with different ways of interpreting 'impact'. For example, Cruz Rivera et al. (2017) conducted a systematic review to identify metrics used to measure the impact of health services research. The review synthesised 24 different impact frameworks to identify six overarching categories of impact. These were: 'primary research-related impact', 'influence on policy making', 'health and health systems impact', 'health-related and societal impact', and 'broader economic impact' (Cruz Rivera et al., 2017) (pp.1). However, the researcher did not apply this framework, as there was little information available about how to do so, or how time-intensive it was to use.

Other emerging methods include realist methods. Rycroft-Malone et al. (2011) assessed impact alongside two conceptual frameworks in order to measure the impact of research conducted by three Collaborations for Leadership in Applied Health Research and Care (CLAHRCs). The research was conducted by participants from three CLAHRCS, who each provided comparative case studies to explore knowledge use in different contexts (Rycroft-Malone et al., 2011). However, this method of determining impact is labour-intensive as it utilises longitudinal study (Rycroft-Malone et al., 2011).

The Research Council UK understands impact to consist of three key areas: academic, economic, and societal impact (Research Councils UK, 2014). It also highlights the importance of raising awareness and disseminating research to a diverse audience in order to increase the potential for impact (Research Councils UK, 2014). The pathways to impact are illustrated below (Figure 24).

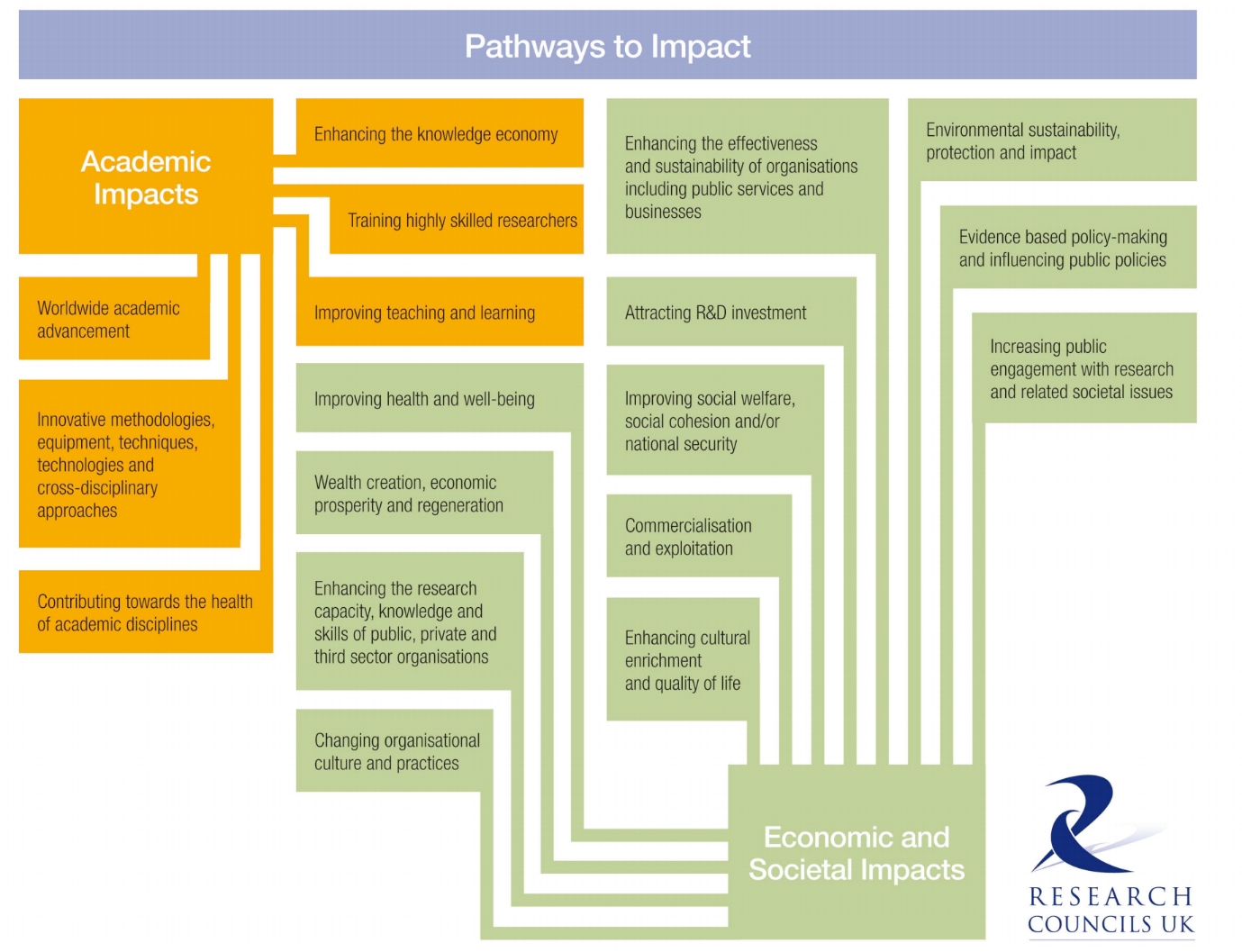


Figure 24 Pathways to impact as illustrated by the Research Council UK (2014)

The most appropriate impact framework is applied to determine potential for impact in each study. If the stakeholders involved in the coproduction of the impact strategy agree on the nature of the problem and its solution, then the research impact will focus on the strength of the evidence. However, when the project explores the complexity of a phenomenon, then impact can be more productively explored in a way that complements the range of knowledge generated. This includes research that is underpinned by constructivist, realist, and critical approaches (Greenhalgh et al., 2016). In light of this, the Research Impact Framework (2006) was used to prepare for and then assess potential for impact. This framework highlights four key areas of impact, which are further subdivided into sub-sections. These are: research related, policy impact, service impact, and societal impact (Kuruvilla et al., 2006) (pp. 4).

The framework was designed by reviewing pre-existing frameworks. These included the payback model, health systems frameworks, a knowledge transfer approach, a model that addressed developing evidence to implementation, and economic approaches. It also incorporated approaches that focused on the link between globalisation and health, pathways to communication and social change, health promotion outcomes, and non-financial constraints within health systems (Kuruvilla et al., 2006). Finally, research assessment criteria also informed its development, e.g., the UK Research Assessment Centre Exercise. This approach was tested and the framework further developed by identifying impact through use of semi-structured interview guides with researchers. Areas for impact were then mapped, along with descriptions of categories (Kuruvilla et al., 2006). This should allow for sufficient exploration of impact.

The National Institute of Health Research notes that different trusts, organisations, and universities will have different ideas about what impact looks like (National Institute for Health Research, 2017). Impact should therefore be co-produced by a range of stakeholders throughout the project. This allows stakeholders to collectively agree on the benefits that should be tangible from the project (National Institute for Health Research, 2017).

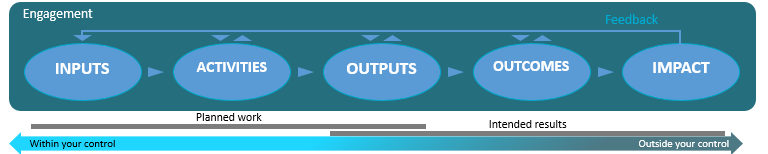
The Commonwealth Scientific and Industrial Research Organisation (CSIRO)'s Impact Framework proposes five stages to achieving impact (Dowd, 2016). 

Figure 25 CSIRO's impact framework (Dowd, 2016) (Slide 5)

The five stages are as follows:

* Inputs: This refers to the resources applied to deliver activities; e.g., staff and grants (Dowd, 2016)
* Activities: Work performed through inputs and mobilisation of resources, with the intention of achieving certain outputs; e.g., industry engagement (Dowd, 2016)
* Outputs: Solutions that result from the activities; e.g., publications, reports, presentations (Dowd, 2016)
* Outcomes: Intended or desired change realised from outputs; e.g., outputs accessed by users (Dowd, 2016)
* Impact: Long-term benefit to society, economy, policy, and academic knowledge; e.g., improved quality of care (Dowd, 2016)

In order to create the potential for impact as suggested by the Research Council and CSIRO, various awareness-raising activities were undertaken (Research Councils UK, 2014, Dowd, 2016).

* 1. Awareness-raising from the outset

The activities undertaken to raise awareness are described below. These include the SIG, the East Riding Care Forum, and engagement with ENRiCH. Some of these activities also helped create the potential for impact, such as the East Riding Care Forum, liaising with CCGs, and engagement with ENRiCH.

**Special interest group (SIG) on technology in care homes**

The Collaboration for Leadership in applied Health Research and Care Yorkshire and Humber (CLAHRC YH) is a programme that undertakes research of direct relevance to clinical practice and translates healthcare research into practice. This project was adopted by the TaCT (Telehealth and Care Technology) theme, within CLAHRC since 2008. This theme is focussed on the management of long-term conditions (NIHR CLAHRC, 2016).

These special interest groups were designed to facilitate the discussion of health technologies under the aegis of CLAHRC, whilst also enabling networking between partners. This event was just one in a series of special interest groups held in Sheffield by the TaCT theme, and organised by me to raise awareness of technology's potential for the care sector and in fostering discussion, with the added benefit that the outputs from the day could aid survey development (Table 10, pp.65).

Attendees at the SIG on 30 September included care home managers, healthcare workers, technology providers, researchers, staff from the local authority, Sheffield Health and Social Care, Sheffield Teaching Hospitals, and commissioners (Appendix 3).

The perceived opportunities and limitations of technology in care homes were identified through presentations and debate. The presentations were from a range of researchers currently developing new technologies to be used in the care sector. The debate was then facilitated by asking delegates to consider what they believed the opportunities and limitations to be, and to note them on a white board. These were used as prompts by the event Chair to start a discussion. The output was a list of opportunities and limitations to using or integrating technology, and a full report of the day was produced. This included a summary of the presentations, highlighting the technologies currently in development. The report was sent to delegates to refer to (Appendix 3). Observations were collated and discussed at the end of the day, and were then reviewed to identify possible themes/questions to inform response categories for the survey (Table 10, 65).

This workshop helped to inform the survey (Table 10, 65) and was used to recruit participants for the qualitative interviews that were conducted following the event (4.5). It was also hoped that the event would raise awareness of the project and thus improve the response rate for the survey.

The main questions identified from the debate at the special interest group were as follows:

* *What impact is technology perceived to have on care?*
* *What problems may there be in using the technology?*
* *What human factors may affect the use of the system?*
* *What logistical barriers may there be to using the system?*
* *What are the ethical issues around the use of technology?*
* *What conditions is it most suitable for?*
* *How accessible is the system for those with disabilities or poor communication skills?*
* *What purposes is it best used for?*
* *How does using the system affect the staff?*

In addition, the opportunities and limitations associated with integrating technology were discussed. The limitations included:

* Difficulties in training and checking competency
* Less personal contact for residents
* Knowledge of staff
* Cost
* Connectivity
* Care home residents may find the technology confusing
* Staff reluctant to take responsibility
* The need to build trusting relationship with technology
* The reliability of the technology and turnover in care homes

The potential opportunities included:

* May give people more control over their treatment and more independence
* Symptom discussion assessment available via video conferencing in residents' own bedrooms
* Opportunity for post-falls assessment
* Alleviate need for emergency care practitioner visit
* Health professionals can monitor the situation remotely and give advice to staff
* Staff may feel more supported as they can learn from difficult scenarios and increase their confidence and that of the families
* Better continuity of care
* Cut down on visiting time and cost for healthcare professionals, care home staff, and residents
* Convenience
* Enables care closer to home, which is what residents and their relatives want

It was noted there were more comments reflecting perceived limitations, which suggests stakeholders are cautious about the use of technology.

**East Riding Care Sector Forum**

After the survey had been developed and disseminated, the initial findings were presented at the East Riding Care Sector Forum (Outputs, pp.4). The East Riding Care Sector meets three times a year, with the aim of giving providers the opportunity to network with care homes and domiciliary care providers to share Information, particularly relating to best practice guidance, new initiatives, and changes to legislation and regulations, and to support providers in the delivery of good care (Greenwood, 07/12/2017 09:25).

Approximately 150 care home managers and care workers attended this event, and there was great interest in the videoconferencing technology and how it could be used. This was conducted to raise awareness and recruit survey respondents.

**Liaising with local Clinical Commissioning Groups (CCGs)**

Liaising with commissioning groups is important because it allows for easier dissemination of findings and enables CCGs to make better-informed decisions about funding services.

During the period in which the researcher was interviewing participants for Case Study 1, they also liaised with the local CCG (NHS Scarborough and Ryedale). This was on advice from the manager, who had said they were attempting to evaluate the system themselves. They were evaluating the videoconferencing system with nine care homes within that local authority, and noted that they were interested in the findings from this project (7.9.2). Their evaluation aimed to establish whether videoconferencing reduced hospital admissions for residents in care homes. The evaluation used postcode data to identify hospital admissions and found that in homes that were using videoconferencing, hospital admissions were in fact higher.

One possible explanation for this finding is error(s) in the study design. The main error identified was that the data used to identify hospital admissions was aggregated by postcode, making it difficult to distinguish care home admissions from those in the local area. The CCG shared what they had learned, stating that they found the most pertinent factor for implementation of videoconferencing was leadership involvement (Section 8.8.2, impact in other CCGs).

* 1. Engaging care home networks for potential impact

**Enabling Research in Care Home (ENRiCH) Network**

The researcher also accessed the support of the ENRiCH network during the project. ENRiCH is a care home network established by the National Institute of Health Research (NIHR) to help bring together care home staff, researchers, and residents, to improve the quality and quantity of research conducted in care homes with the aim of improving the lives of residents (ENRICH, 2015). This network has been evaluated and shown to be beneficial for increasing the amount of research undertaken in care homes and improving the recruitment of participants (Davies et al., 2014).

The network was used to raise awareness of the research, address barriers to the implementation of the research, and to access PPI (patient and public involvement) groups. Patient and public involvement groups are where relatives, residents, and friends can become involved in research by identifying research priorities, aiding the development of research questions, planning research, being co-applicants on research proposals, being active researchers, being members of an advisory committee or steering group, or commenting on participant documents (Enabling Research in Care Homes Network, 2013).

The potential impact of this project was further increased by obtaining feedback from the ENRiCH PPI group on participant documents. This was to ensure that all such documents were acceptable to, and understandable by the target population (care home staff, residents, and relatives), thus making them accessible for potential participants. In addition, PPI members advised on how best to explain complex terms, such as 'videoconferencing', to residents who may not have heard them before. This enabled study participants to be better involved in the research and to gain a better understanding of the project. They were also able to make more informed decisions about their involvement in the study. This will have improved the potential for impact by increasing understanding of the project in the care homes visited, and by improving participant recruitment.

Finally, a project was co-designed by the researcher with the ENRiCH coordinator for Yorkshire and the Humber. After a shared interest was identified (Wyld and Newbould, 2017), funding was applied for through the Wellcome Trust. The project was designed to explore participants' experiences of taking part in care home research. The project was completed under the researcher's supervision and undertaken by an undergraduate student. (For more information, see Chapter 7.1, 8.4.1 and Appendix 10).

**My Home Life**

My Home Life is another care home network, which works with researchers to co-create new ways of working. At the beginning of the project, the network was explored as an option for support. However, due to the England team being based in London, it was challenging to engage directly with their services. In addition, they were not always readily available, meaning support was variable (My Home Life, 2017). The combination of these two factors provided the rationale for pursuing support from the local ENRiCH network instead. However, My Home Life were contacted at the end of the project to request support and to disseminate the CCG report, which they agreed to, and they further said they would communicate the findings to those in (or engaging with) their network.

* 1. Demonstrating pathways to impact

Below are the ways in which this research has potential for impact, and has realised that potential. These have been mapped onto the research impact framework (Kuruvilla et al., 2007).

* + 1. Academic Impact

**Dissemination**

Peer-reviewed papers have been published (Outputs pp.4). Where possible these are open access to allow greater dissemination of knowledge to all stakeholders involved, and thus extend the readership. These publications may create impact as they have helped to identify research gaps in this area, which need to be fulfilled in the interests of the future commissioning of videoconferencing. By December 2017, the metric showed that the scoping review had been downloaded 73 times and viewed nearly 500 times. This is an indication of the level of interest in this publication.

The telemedicine review that presented a clearer definition of the technology terms for use by researchers is also to be published. This will increase the potential for impact in terms of the understanding of these terms, which may help standardise their use. In addition, when the findings from the in-depth case studies have been published, this will also create potential for impact by increasing interest in the area.

This study has also been presented at various conferences, both nationally and internationally (Outputs, pp.4). This enabled the researcher to raise awareness of the project, build networks, and share the research with others working in similar areas. These collaborations, along with those previously mentioned (7.3), have been maintained throughout the project, making it easier to disseminate the findings and develop research collaborations. These connections have again increased the potential of this project to achieve impact, as increased awareness will help inform future work (7.14).

Additionally, department blog articles were written about the initial work, keeping interested stakeholders up-to-date with the research outputs. Although no one has contacted the researcher as a result of these blog articles, they may have increased the awareness of the project and helped to inform members of the public about ongoing work.

**Capacity building for research**

Whilst undertaking the project, the researcher compiled a list of practising PhD students working in care homes, and developed a group ([www.jiscmail.ac.uk/PGRCAREHOMERESEARCH](http://www.jiscmail.ac.uk/PGRCAREHOMERESEARCH)). This group provided a forum for sharing concerns and aiding personal development, helping members of the group improve their research by sharing resources and supporting one another. This was in addition to the partnership developed with ENRiCH (7.12.1), and enabled the training of a student interested in a future research career in this area. The student has now taken on additional roles within his department to improve the potential for impact of his research.

**Research methods used**

This work has increased its potential for impact by demonstrating the usefulness of its methods. Realist evaluation is a developing method and increasing in use. This project has helped to illustrate how it can be successfully applied to undertake theoretical research in this area. This is particularly meaningful in light of the review by Luff et al. (2011), which emphasised the importance of acknowledging the complexity of the care home context in research projects (Luff et al., 2011). The method was expanded upon by applying conversation/interactional analysis to summative questions (5.13.12). This proved to be very beneficial in informing the analysis, and may impact on future realist research if replicated by others.

This study used data from the Care Quality Commission (CQC) to identify eligible homes for the survey, a method which has not been widely adopted. This project enabled this method to be trialled and critiqued to help inform future researchers and to identify how future research could be improved by collecting more standardised information. If this is acted upon, it could increase the potential for impact in terms of giving researchers access to a large and reliable data set that could be used for analysis and for informing more rigorous trials in care home research.

Lessons have also been learnt from this project and the undergraduate project undertaken with ENRiCH (7.12.1) about how to better work with care homes. This work has been widely shared through a range of outputs (pp.6), thus increasing the potential for impact. The aim was to inform the future practice of researchers in this area. At present, there is no available feedback on how many people are interacting with the outputs.

* + 1. Policy impact

This research, if realised, will aid the implementation of the five year forward view (2014) (NHS England, 2014a). This paper conveyed the importance of harnessing the use of technology to meet increasing healthcare demands (Kahn and Long, 2007). This project has the potential to influence the implementation of national level policy through the development and dissemination of recommendations for commissioners when targeting local funding (Appendix 9).

The report for the CCGs (Appendix 9) was developed to help improve the translatability of the research. The report was forwarded to the 15 Patient Safety Collaborators hosted by the Academic Health Science Networks (AHSNs). It was uploaded online (pp.4), and sent to the NHS England care home team, videoconferencing providers, care home research networks, ENRiCH, and My Home Life. The findings of this report were then distributed through these networks, as confirmed by the founder of My Home Life and by the Yorkshire and Humber representative for ENRiCH. The recommendations were developed to disseminate the findings to key stakeholders as a resource to help inform the decision-making of commissioners and managers.

Although the report was sent to the NHS England care home team for dissemination, the representative from the local CCG identified in Case Study 1 was sent the report directly, as they had asked to be kept informed of the findings of the study. This was due to there being a number of homes in this area that had seen the benefit of using the service and that were committed to continuing its use, despite the findings from the evaluation conducted by the local CCG. Thus, this CCG was sent the output of this research, which identified possible factors affecting the successful implementation of videoconferencing (pp.4).

* + 1. Service impact

This project also has the potential to improve cost effectiveness in the long-term. If there is an increase in the successful uptake of the technology and the use is sustained, this may ease unnecessary travel for healthcare professionals. Cost would also be reduced by preventing unnecessary admissions.

* + 1. Societal impact

The potential for impact at societal level has also been improved by communicating the research through various lay outputs (pp.4). For example, the work was presented at Café Scientifique, where approximately 40 members of the public attended a free event to find out more about the project and increase their knowledge of available videoconferencing services in care home research. This awareness will create the potential for impact on practice, as attendees may then disseminate knowledge to their local care homes. There was also the suggestion of impact as a member of the Sheffield Health and Social Care Trust asked for more information about the project, as he was attempting to make the argument for his own to invest in the system. This event was in addition to the initial work presented at the activities undertaken earlier on in the project (7.7), which also created the potential for impact and may help increase uptake.

Additionally, the potential for societal impact will be increased by the realisation of the CCG report (Appendix 9). As the report has been made available to care home providers, staff within the home may make more informed choices about whether or not to trial videoconferencing. Managers may also more effectively target contextual factors that lead to changes in care home environments and inhibit the uptake of videoconferencing, such as managerial style, and the use of recruitment strategies to reduce turnover. Care homes as a result may foster environments that are more trustworthy, and where staff feel free from criticism. This would also foster better communication links in the home, which would help support the dissemination of information. If this were to be achieved, it may then encourage the development of care staff self-efficacy, and encourage organisational commitment.

**Macroeconomic/related to the economy**

If the findings are used by CCGs, this could also make the process of implementation more cost effective, as funding could be directed more effectively. Care homes would also be better able to manage factors that reduce the uptake and sustainability of videoconferencing, therefore able to better target resources (NHS England, 2014b).

* 1. Research ready care homes

Support for work in this environment can be obtained by working with care home networks, such as ENRiCH (ENRICH, 2015) and My Home Life (My Home Life, 2017). These networks facilitate open discussion between researchers, patients, and the public, to identify the best methods for researching care homes and sharing experiences (My Home Life, 2017). They facilitate access to 'research-ready' care homes: homes which have signed up to get involved in research in their local area (ENRiCH, 2017). The networks can be used to facilitate recruitment for researchers, as well as allowing care home managers access to information about relevant projects (Davies et al., 2014). ENRiCH also provides support through access to PPI groups (7.8) and a forum for the dissemination of findings (7.12.1). These were invaluable in raising awareness of this project (7.7).

However, in order to increase the quantity and quality of research in care homes (Wyld and Newbould, 2017), there must be more training provision aimed at increasing the skills of researchers working in this challenging environment. This would be beneficial for growing this area of research (Davies et al., 2014). Guidance from the website was useful (ENRICH, 2015), but more structured training may help build the confidence of researchers new to the field. This would have also been beneficial for the undergraduate who undertook the project to look at the experiences of participants in care home research (7.12.1).

* 1. Strengths and limitations

The overall strength of this PhD was that the range of methods used enabled an exploration of the mechanisms behind successful uptake of videoconferencing within Yorkshire and the Humber care homes, in an area where robust research is lacking (3). However, more resources and time would have allowed for a broader range of data collection, for example by including NHS staff. The following section reviews the strengths and limitations of methods used in this project.

**Scoping review**

The scoping review enabled the researcher to successfully map current research on the use of videoconferencing and to identify relevant research gaps that could be explored (3) (Arksey and O'Malley, 2005). Although scoping reviews do not traditionally assess the quality of the literature, an assessment was undertaken to ascertain the quality of the research identified. This help to establish that research in this area was limited in quality and generalizability (3.4), and identified the need for more research in this area.

However, the scoping review was conducted prior to the selection of the realist methodology. The papers identified in the scoping review were assessed for the potential development of mid-range theory, but a more robust realist review may have been more fruitful in establishing mid-range theory for development (3). Additional limitations are outlined in 3.6.

**Survey**

One strength of the survey was that the bottom-up approach used to develop the content ensured that the survey addressed its key aims and objectives; in contrast to a top-down approach, with which the content would have derived from existing literature (Stevens and Palfreyman, 2012). This was useful, as the literature identified did not specifically address factors relating to the uptake and sustainability of videoconferencing in England (3). Individual interviews also meant that there was greater sensitivity to the data collected (Stevens and Palfreyman, 2012), meaning that staff could expand and inform the survey in ways they thought relevant for their individual care homes.

Interviewing care home managers to aid with the design of the survey also allowed for more appropriate language to be used, as care home managers were the target population for the survey. This may have improved the content validity and response rate. It will also have aided the development of the survey to be more amenable to self-completion (Stevens and Palfreyman, 2012).

The survey was successful in mapping the current provision of videoconferencing across Yorkshire and the Humber. It enabled the identification of three case studies varying in their uptake and use of videoconferencing, in addition to a range of providers.

**Limitations of the survey**

The first limitation of the survey is that it was a descriptive survey, meaning it did not provide robust evidence for cause and effect relationships (Bowling, 2014). Therefore, this survey could only be used to identify some aspects of context and outcomes, and could not explain the mechanisms that led to the different outcomes. Additionally, the findings from the survey could not be generalised to the rest of the population, as the survey was sent only to homes within Yorkshire and the Humber who had satisfied certain criteria (4.10). The response rate was also small, which although adequate for meeting the needs of this study, meant that this the sample was not generalizable. The database used to identify suitable homes was found to be unreliable, with many homes responding who were outside of the eligibility criteria. This may also mean that suitable care homes were missed (4.9).

When considering survey design, ranking questions were incorrectly interpreted by the majority of respondents, which meant that a large amount of data from these questions had to be excluded from the analysis. If the researcher were to do this again, ranking questions would not be included, and check box questions would be used instead (Gunn, 2002). This would not allow for the prioritisation of statements, but it would make the questions easier for the respondents to follow, and may improve the reliability and validity of the responses (Gunn, 2002). For information on the challenges faced, see Chapter 7.

**Case studies**

The strengths of the realist case studies include the participant recruitment methods used. The recruitment of the care homes for the case studies was successful, and this may have been due to the relevance of the project. All of the care home managers who were approached for the case studies expressed an interest in the service and the ways in which it could help their residents and staff. This was important, as staff have limited time and must focus their efforts on research of pragmatic benefit to them (Goodman et al., 2017c).

The use of realist case studies allowed for the generation of mechanisms that led to different outcomes in reported uptake and sustainability in the survey (Better Evaluation, 2017). They also provided the rich data required to successfully test and refine theories, whilst eliciting the thoughts and experiences of participants through the teacher learner cycle (Pawson, 2013). It also allowed for the comparison of different care homes that were using videoconferencing, to test theory and purposive sampling of cases, which enabled the theory to be tested in all its dimensions (Better Evaluation, 2017, Kœnig, 2009). This meant the theory could be tested in homes that were funded differently, and different types of care homes, as well as homes that had residents with different needs and were located in different geographical areas. This enabled the testing of these factors to establish if they influenced outcomes. Realist case studies are thought to increase the generalizability of case studies, as they expand and test theoretical propositions (Easton, 2010).

**Limitations of realist case studies**

In terms of limitations, this method is still in its infancy, and still requires development and refinement (Rycroft-Malone et al., 2010). This was addressed by monitoring new training materials released by the RAMSES projects. The aims of RAMSES projects are to produce quality and publication standards, in addition to training materials for different approaches to realist research (The RAMESES Projects, 2013-2017). The researcher also attended CAREs events (5.7, pp.106).

As a result, there were challenges to the application of this method (see 6.10 for more information), such as unclear definitions of contexts and mechanisms. This was addressed by using the definition provided by Dalkin (2015) (pp.106) so as to allow for clearer refinement of key theories (6.8).

When considering analysis of realist data, there is a deficit of literature on how to use data analysis software such as NViVO to develop realist theories (Fletcher, 2017). This proved challenging in the early stages, when seeking to establish areas for theory development (Fletcher, 2017). However, the use of mind maps helped provide clarity in the identification of themes for development, and these were later mapped to the CFIR framework (Appendix 8). Applying this structure further helped refine the researcher's analysis and thinking with regards to emerging and refining themes.

Finally, the amount of data collection had to be reduced, due to the limitations of PhD studies, such as time constraints and limited resources. More resources would have allowed for a greater a number of factors to be explored in more depth. For example, it would have been useful to speak to NHS staff to get a service provider perspective; however, the challenge of gaining NHS ethics consent, and the labour and time-intensive process for gaining approval meant this was not possible.

* 1. How to Understand and Overcome Challenges when Working with Care Homes
     1. Exploring the experiences of participants in care home research

Prior to undertaking this work, the researcher was aware that working with care homes would pose challenges, such as those associated with working in such a busy environment, the fluctuating capacity of residents, and challenges to recruiting care homes (ENRICH, 2015). To help overcome these barriers, advice was sought from ENRiCH at regular intervals, and ENRiCH toolkits were accessed (Chapter 8.7). To build on the work undertaken by ENRiCH, a bid was made by the researcher to support and supervise an undergraduate student to undertake a small summer vacation project, under the researcher's direction, looking at the experiences of research participants in care homes. The researcher trained the student in how to undertake a systematic literature review and how to collect, analyse and report qualitative data. Additionally, the researcher encouraged the undergraduate to develop their interpersonal skills in terms of how to work with vulnerable adults and negotiate the busy care home environment. This project was seen as being integral to this thesis as it helped get a more holistic view of challenges faced from a broader perspective and helped inform the future work of both the undergraduate student and researcher as well as to help guide the work of ENRiCH who supported this project. Gaining the perspective of the care home staff also helped in the identification of possible issues with the data collection for this project, such as gaining clarification that some less senior members of care staff felt less able to contribute to the research due to a lack of confidence.

The rationale for this project was that care homes are under-researched in comparison to other areas of elderly care, and with an increasingly ageing population and consequent demand for care homes, research that could aid the development of new innovative interventions would be extremely valuable. This necessitates more research and a better understanding of how participants experience research, to advise researchers on how best to work with care homes in the future. It is hoped that this will help to improve the quality and quantity of care home research.

The project involved a small, systematic narrative literature review and interviews with five participants who were also involved in this project. They were asked to provide their thoughts and feedback on the project, and describe what they felt could have been done differently to improve the quality and quantity of research in care homes (Wyld and Newbould, 2017).

The key themes identified were around the perceptions of research, the engagement process, and advice. Recommendations were identified and reported on (Appendix 10). Most of the findings of this project reflected the experiences of the researcher in undertaking the PhD (Wyld and Newbould, 2017) (see Appendix 10 for the full report).

* + 1. Challenges of working with the funder

**Funder involvement**

When working with the research funder, there were challenges associated with concerns around anticipated research outputs. A trustee from the organisation's research board came to discuss how the project might be taken forward, and we discussed the project timescale, suggestions were made about likely outputs, and in particular, how project impact might be maximised. The trustee recommended that an impact plan be incorporated into the project to encourage dissemination of findings and changes in practice. Study design was also discussed, with the trustee suggesting that a social network analysis or some kind of complex evaluation may be appropriate to identify the contextual factors that could affect uptake.

Another concern for the research was the involvement of the funder in the research, as this could introduce bias (Romain, 2015). However, despite the initial input from the trustee, they stated that they would like to remain independent from the research, so as not to influence the outcome. This was maintained throughout, with the researcher allowed full autonomy over the project.

**Translatability of research**

To ensure the project's relevance and utility for care homes (Goodman et al., 2017c), two strategic managers from large care home providers were consulted. They were asked about factors informing their decision-making around the use of technology within their organisations, and they were asked about the outputs they would find useful from this project (Chapter 5.11, pp.112). The observations from these discussions helped to define the initial boundaries for the project (Chapter 5.11, pp.112).

**Communication**

One challenge noted by Moore (2006) was that of ensuring that communication with the funder was open and clear, in order to build a trusting relationship. This type of relationship would be useful when applying for future research (Moore, 2006). For this purpose, the funder was provided with annual reports, giving updates on the progress and the direction of the project (Appendix 11 & 12). Mid-way through the project, the survey findings were presented at an annual conference, convened and attended by care home managers employed by the funder. This allowed a broad range of stakeholders to be updated on the progress. As part of the report, the funder was updated on the timescale for the project, with achievements and future goals highlighted. They were also sent outputs as soon as they were accepted, and kept up-to-date with additional work linked to the project.

The CCG report was sent to the research funder when finalised, to make them aware of possible recommendations arising from the project, before the project end. Upon completion, the thesis will be sent to the funder in a timely manner to ensure confidence is maintained in the research department for future projects.

* + 1. Survey design

Participants were identified and recruited for the initial interviews through existing contacts who had attended the special interest group (SIG) (Chapter 8). This may have influenced the research, as the participants already had an interest in the research and in progressing methods of care. Other care homes that were harder to engage may have had very different stances on the issues around technology and survey design (Junghans and Jones, 2007). This was addressed by recruitment using purposive sampling, identifying managers from homes with varying levels of experience in use of technology.

* + 1. Dissemination of survey

**Using secondary data**

It transpired that the Care Quality Commission (CQC) website that was used to identify care homes to whom the survey could be sent was storing inaccurate data (Chapter 4.10, pp. 70) (Care Quality Commission, 2016). The CQC were contacted initially to enquire about how their geographical boundaries had been defined, and it was noted that there were no definitions for areas and that the registrations had been completed based on the manager's perception of the part of the country into which they fell. CCG boundaries (2013) were applied to address this (Office of National Statistics, 2016). It was assumed that the data in other sections had been informed by the managers' perceptions too; and so, to address this, the covering page of the survey described the eligibility criteria for the survey. This was done to minimise responses from services that did not fit the criteria. However, there were still a number of managers from ineligible homes who returned the survey (4.11). This database must improve if it is to be used in future research.

The survey covering letter requested that the care home manager complete the survey. This was to ensure that the survey be completed by someone who had seniority in the home and the experience to make the necessary judgements. However, this could not be controlled. In addition, one home replied multiple times, suggesting that more than one care home manager may have filled it out, and that the task may have been delegated.

**Engaging care homes**

Finally, one difficulty with undertaking this type of research was engaging members of the sector to complete the survey. This could be due to time and resource constraints (Royal College of Nursing, 2012). To improve the response rate, all of the respondents were offered a place in a prize draw, with the opportunity to win a gift voucher. It is difficult to establish if this improved the response rate, which was 14% (126). Although this response rate was sufficient for this project, 859 letters were sent out, in addition to reminder letters, making this process very time-consuming and work intensive.

Another challenge was that some surveys were returned anonymously. This meant they had to be excluded from the analysis and reporting, as respondents had been asked to complete their care home information in order to express consent to take part in the study. Of the 124 responses received, 113 replied by post and 13 online. This may indicate that there were technical barriers to engaging care homes in research via technology. Giving participants the opportunity to respond with hard copy forms may be useful for engaging this sector.

* + 1. Realist evaluation: case studies

**Recruitment**

When contacting care homes for the case studies, one of the three was quick to respond, noting that the project would be of benefit to them. This supports the research conducted by the undergraduate student, which found that homes were more likely to take part in research that was congruent with their priorities and beliefs (Wyld and Newbould, 2017). The other two homes took longer to respond, as the managers were very busy. It therefore took longer to arrange the meetings, despite being research active homes and interested in this project. This was addressed by remaining flexible and allowing the home to dictate the best time to call and suggesting email communication.

**Permission**

Obtaining permission from the owner in one of the homes was also time-consuming. The care home was part of a large private organisation and the owner was unavailable. As a result, advice was sought from ENRiCH (ENRICH, 2015). One of the contacts for Yorkshire and the Humber agreed that the manager could consent to the research commencing, and the owner's permission obtained at a later date, giving them the option of withdrawing.

**Resources**

Once consent had been obtained, there were challenges with undertaking participant interviews. Time constraints were also problematic. To address this, the researcher approached the care home as advised by the care staff to undertake interviews and visits. Despite this, interviewing in this setting was challenging, as the interviews had to be conducted with staff in between duties, meaning transcripts were often fragmented. When staff were available for interview, they were often distracted by monitoring residents and only available for short periods of time (e.g., during breaks). This made it difficult to obtain a narrative from the staff, with them frequently providing only quick and sometimes non- descriptive answers.

This was addressed by asking participants to further explain or expand where possible. Despite this, the shortest interview was just six minutes, due to the care assistant having to go into hospital with a resident. This point was supported by work of the undergraduate student, who found that some participants reported a sense of responsibility towards researchers, and recognised a need to make more time for the research (Wyld and Newbould, 2017).

A lack of resources meant there was little free space in which to conduct the interviews. A lack of private rooms and available staff often meant that interviews had to be conducted in communal areas. This was so that staff could care for residents.

One way of addressing this was a flexible approach to the interviews. Where telephone interviews were used, they were most successful for eliciting a narrative from the participant. This may have been due to a lack of demands on the participants at the time of the interviews, in contrast to interviews conducted at the home, where staff often had other commitments to balance simultaneously. However, this only worked when the participant was willing to speak out-of-hours, and site visits were still necessary to write field notes and become familiar with the systems in place at the home.

**Safeguarding**

On one occasion, a safeguarding incident occurred shortly after the visit had commenced. The incident involved two residents going into hospital, and as a result the home was short-staffed and the manager unavailable. The visit was cut short due to the poor availability of staff, and rearranged for a later date.

**Staff confidence**

Additionally, care assistants sometimes lacked confidence. This impeded responses, as respondents doubted their ability to give useful answers to research questions, or doubted their ability to undertake their role. This was addressed by seeking to reassure staff that there were no right or wrong answers, and that the interview was aiming solely to elicit their opinions. This appeared to assuage staff fears and encourage them to provide more of a narrative. This is supported by the work of the undergraduate student, who also reported that staff who were low in confidence found taking part in the research useful for building their confidence (Wyld and Newbould, 2017).

Finally, there were two barriers faced during the work on resident records. One home consented to records being viewed where residents had also consented, and then later withdrew consent due to concerns about confidentiality. The second home struggled to provide the requested documents due to time constraints.

**Ethical concerns**

The ethical concerns and ways in which these were addressed are discussed in 5.12.2.

* + 1. Summary

There are a broad range of challenges when undertaking research in care homes. These include obtaining accurate data about the homes, and interviewing staff who are burdened by limited time and resources. Engaging care homes is also a challenge.

For future researchers, working with a care home research network to identify ways of overcoming these barriers is recommended. Remaining as flexible as possible will help to address challenges related to time and resource limitations in the care home. Flexibility is essential, as care homes are an unpredictable environment. Additionally, making sure the research is considered relevant to the home and its needs will aid recruitment of participants. In the long-term, more research on addressing barriers to research in care homes, and obtaining accurate big data on care home provision by larger scale studies, would be beneficial for improving the quality and quantity of research in this area.

* 1. Reflective discussion

The reflection section aims to explore the researcher's experiences and impact they had throughout the research on the findings reported.

Identity is complex and fluid, with both the researcher and the participants having their own identities related to characteristics such as ethnicity, education, age, and gender (Muhammad et al., 2015, Wigginton and Setchell, 2016). Identity is also situational, being shaped by our position in society in relation to these characteristics (Muhammad et al., 2015, Wigginton and Setchell, 2016). This is particularly important to acknowledge when considering the researcher- researched relationship and how these identities may have shaped and influenced data collection (Muhammad et al., 2015, Wigginton and Setchell, 2016). These relationships are made clearer by an understanding of social determinants of power structures (Marmot, 2009, Wilkinson and Pickett, 2010).

The researcher's identity will have been perceived differently at different times throughout the three case studies, and by different participants. Differences in age and background between the researcher and the participants may have influenced data collection, particularly when considering that the researcher is well-educated, younger, and asking questions about access to healthcare (Zubair and Victor, 2015). Care staff may have felt that the researcher was there to assess their quality of care, and may have had anxieties about how this work would be used and how it would reflect upon them, particularly with the challenges facing public perception of care homes in the media (Royal College of Nursing, 2010). The researcher attempted to minimise note-taking in public areas, so as not to create a feeling of distrust, and sought support from care home managers in promoting the research to everyone in the homes.

Staff lacking confidence when engaging with the researcher was noted as a challenge in Chapter 7 pp.242. This may have been due to a difference in education level, or the perceived privilege of the researcher (Muhammad et al., 2015, Wigginton and Setchell, 2016). To address this, the researcher participated in activities in the home, and attempted to build a rapport with participants. For example, they ate lunch with the residents and staff, as this allowed all involved to ask questions about the project.

**Knowledge of researcher**

Although realist evaluation was identified as the methodology for this project, there were challenges with applying it. These was associated with the researcher's application of the methodology and their learning through its application (Jagosh, 2017a). As a result, elements of the method could have been better applied; for example, asking a mix of successive and generative questions, as opposed to simply generative. One example would be: 'So, do you think it has helped the confidence then, in the agency staff?'although this was in follow-up to a response and asked to test a specific theory, I think a more generative question could have been: 'So how do you think this has affected how agency staff feel?' This would have allowed the participant to put forward any of a range of different emotions arising as a result of using videoconferencing (Jagosh, 2017b).Questions that were seen as being summative, and which might therefore have influenced responses, were reviewed using conversation/interactional analysis to identify any bias that may have arisen as a result (Chapter 6.6) (Sidnell and Stivers, 2012). In a similar way, asking questions about direct theories appeared to shut down interviews, as respondents reverted to yes/no answers, as opposed to offering a narrative. This was quickly established and the interview guide amended accordingly (Jagosh, 2017a).

**Analysis**

When undertaking qualitative and quantitative research, interpretation of the results and analysis can vary depending on the background of the researcher (Fernandez et al., 2015, Clinton-McHarg et al., 2016). Had someone else conducted the research with a different background, the results may have been analysed and interpreted differently (Fernandez et al., 2015, Clinton-McHarg et al., 2016). For example, there is structure and guidance on how to use the CFIR coding framework, but these could still be interpreted differently and the data coded into different constructs (Fernandez et al., 2015, Clinton-McHarg et al., 2016).

**Translational research**

As this project was applied research, it must be translated into practice. However, obtaining knowledge to have an impact on practice is challenging (Pincus, 2009).

In order to address this, a report for the CCGs was developed (Appendix 9). However, writing the report was challenging. Presenting findings that are complex and scientific in lay and concise terms has been highlighted as a challenge in previous work on translational research. In the literature, this problem has been attributed to the different cultures of researchers and clinicians, and identified as a key barrier to ensuring findings from research are rapidly used to inform practice (Homer-Vanniasinkam and Tsui, 2012). This resulted in the report becoming labour intensive, and creating a delay in sending the finished work out to care home participants.

* 1. Recommendations for research, policy and practice

This research has demonstrated that technology can be used successfully in care homes, but that there needs to be a greater focus on getting knowledge in to practice, assessing care home readiness and personalising technology for the needs of different homes.

**Policy**

The policy paper on 'Personalised health and care 2020: a framework for action', suggests that technology can be used to drive down inequalities in outcomes and improve access to healthcare services (Department of Health, 2014). This is due to its enabling patients to better manage their own health and improving secure data sharing and communication between health organisations (HM Government, 2014). However, greater collaboration between service providers, care homes, and commissioning groups to identify how videoconferencing would be best implemented into care homes, and to evaluate the use of new technologies before implementing initiatives widely, would be beneficial (Goodman et al., 2017b). For example, a service such as the Airedale hub could be seen as flexible for care homes, but it did not meet the needs of nursing home staff as efficiently as it did those of residential homes.

Robust evaluations would help to identify the reasons for this, and thus better tailor services to the needs of care home providers. This may be particularly pertinent where care homes are struggling with fewer resources to invest in successfully implementing a new intervention. As a result, these interventions could drive up inequalities in care if not properly evaluated; for example, homes that are short staffed or have a high staff turnover may struggle to implement the technology, whilst those that are well resourced may take to it well, further driving up variations in outcome. These challenges are supported by the findings from this research and are highlighted in an online report on new care models (NHS., 2016).

**Future research**

Although this research identified the recommendations outlined in the CCG report (Appendix 9) as the most pertinent for encouraging uptake and sustainability of videoconferencing in care homes, the findings are not definitive and need further exploration. In addition, future research needs to establish outcome patterns linked to clinical and cost-effectiveness outcomes for videoconferencing. Exploration of the possible benefits of videoconferencing in care homes where the staff have high levels of medical training would also be beneficial (pp.180, 189).

More research is required into addressing and improving care homes' readiness to implement interventions, with investigation of care homes that are under-resourced being particularly pertinent. For example, an intervention will not be sustainable if staff do not have time to learn how to use it. In addition, exploring skill mix, social networks, and how teams work together to successfully implement new interventions may be beneficial for improving the uptake and sustainability of interventions in care homes.

**Considerations for service development**

Alongside these recommendations, any providers wishing to set up a videoconferencing service should consider the following key learning points established by this research and the literature.

Co-producing the implementation of interventions with providers would be invaluable for tailoring services to the needs of the care home (Williams et al., 2017) (Chapter 10.2) It is important that all staff at the care home see the need for the service and recognise it as beneficial for residents. Where there are mixed views, uptake and sustainability may be threatened. For example, one respondent noted that if the videoconferencing service they were using were able to prescribe treatment for residents, this would be invaluable. Identifying gaps such as this would be useful for all involved. It would also help to encourage champions when implementing the service (Williams et al., 2017). Documenting how the service is used and its outcomes would be useful for evaluation and for maintaining records for the GP responsible for the residents' care (Williams et al., 2017).

Williams et al. (2017) also suggest that the healthcare professional at the remote site should be based in a confidential setting (Williams et al., 2017). This is supported by the findings of this study, which found that where broadband signals were poor, this endangered resident confidentiality (pp.176). Due care should be taken not to endanger the psychological safety of the user, with work undertaken to build trusting relationships (Cimperman et al., 2013) (pp.193 ).

Ensuring that the service is well advertised, along with a wealth of available information, is essential for enabling the care home manager to make an informed decision about whether or not to trial the system (pp.211)(Greenhalgh et al., 2017, Weiner, 2009). The technology used should be highly portable, or suitable for use in situ (pp. 178). Systems that are time-consuming to set up and move will endanger staff confidence and put additional pressure on homes that may be under-resourced (Greenhalgh et al., 2017, Weiner, 2009) (pp. 178). Expanding on this, Wi-Fi should be available throughout the home from the time of implementation (pp. 176).

Any problems need to be dealt with in a timely fashion, so as not to endanger confidence in the technology (pp.169) (Greenhalgh et al., 2017). Additionally, staff members need training on how to use the technology, with guidance on how to overcome challenges, including being made aware of technical helplines (pp.174). Offering back up support for staff, such as a telephone service, may help tackle staff anxiety related to use of videoconferencing (Greenhalgh et al., 2017, Schonfeld et al., 2017)(pp. 174). Providing an opportunity for staff to trial the service for as long as they need would also be beneficial for helping develop staff self-efficacy in using the technology and the service (Schonfeld et al., 2017)(pp.174 ). It would also mean they could see the benefits of using the service, which would encourage its use (pp. 169, pp. 171, pp.174).

Ensuring enough staff are employed by the videoconferencing provider to meet the demand of the service is also important, as having to wait for a response can endanger confidence, particularly in novice users or where residents are suffering greater ill health (pp.169).

The security and quality of the internet connection must be considered (Williams et al., 2017), as participants in the SIG mentioned confidentiality as a concern. This was also noted to be a concern of residents in the work conducted by Cimperman (2013).

Cimperman (2013) also noted that, for older adults to be encouraged to engage with technology, the residents must see the usefulness of the service, and that the level of expected effort should be low, with them trusting that the technology with which they are communicating is secure. The physician's opinion of the service also appeared to be influential in encouraging use, so this may be another factor to consider when developing a service (Cimperman et al., 2013).

* 1. Conclusion

This thesis explored the factors affecting the uptake and sustainability of videoconferencing in care homes, and identified two key areas for consideration. These are whether or not the care home staff value videoconferencing, and whether or not they have the resources as a team to implement it (Weiner, 2009, Greenhalgh et al., 2017, Goodman et al., 2017c). These were found to be mediated by three factors concerning the care homes: whether or not the care home has a communication culture, the knowledge that staff have of videoconferencing, and effective staff recruitment (Greenhalgh et al., 2017, Goodman et al., 2017c).

If these are addressed, videoconferencing has shown itself to be a viable tool. However, certain prerequisites must be satisfied to ensure that the care home is ready to implement the system.

Future research challenges are to explore and build on these theories. Establishing how different outcome patterns are linked to clinical and cost-effectiveness outcomes would further support effective commissioning of videoconferencing. In addition, more research is required to address and improve a care home's readiness to implement interventions, particularly in care homes that are under-resourced.

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Appendices

* 1. Appendix 1 -scoping review

Hindawi



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*Review Article*

**Videoconferencing for Health Care Provision for Older Adults in**

**Care Homes: A Review of the Research Evidence**

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A scoping review was conducted to map the research evidence on the use of videoconferencing for remote health care provision for older adults in care homes. The review aimed to identify the nature and extent of the existing evidence base. Databases used were Embase, Medline, Web of Science, and Cochrane Library Reviews. The review identified 26 articles for inclusion, of which 14 were case studies, making the most used study design. Papers described videoconferencing as being used for assessment, management of health care, clinical support, and diagnosis, with eight of the papers reporting the use of videoconferencing for more than one clinical purpose. A further eight papers reported the use of videoconferencing for assessment alone. The literature reported the collection of various types of data, with 12 papers describing the use of both qualitative and quantitative data. The outcomes mainly addressed staff satisfaction (𝑛 = 9) and resident satisfaction (𝑛 = 8). Current evidence supports the feasibility of videoconferencing in care homes. However, research needs to be undertaken to establish the contexts and mechanisms that underpin the successful implementation of videoconferencing in care homes and to define useful measures for success.

**Background**

Care homes are defined by the English Care Quality Commission (CQC) as homes that “offer accommodation and personal care for people who may not be able to live independently, with some homes offering 24-hour care from qualified nurses” [1]. According to Gordon et al. (2014) around half of care home residents need help to mobilise, half are incontinent, and three-quarters have dementia [2]. The same research showed that health care provision to care homes in the UK is often inadequate in meeting residents’ needs [2]. Earlier work by the Care Quality Commission [3] reported that care home residents often have inadequate access to health care services. It has been suggested that technology may be one way of addressing the problem [4].

A range of digital technologies have already been used for health care purposes in care homes, for example, telemonitoring devices [5–7], telecare devices [8–19], teleconferencing (the use of telephone) [20–23], electronic health care records [24, 25], telepresence devices (remotely controlled robots designed to give a sense of someone being in that location) [26, 27], digital pen and paper technology [28], and teleconferencing and audit feedback [29, 30].

This review focuses on one type of digital technology, videoconferencing. It has been suggested that videoconferencing may be one way of addressing problems with access to health care [4] by improving access to a range of services [31]; encouraging continuity of care [32]; removing the inconvenience of travel [33]; and improving access for those who may have physical disabilities [34]. The purpose of this review was to identify the extent and nature of available research evidence for the use of videoconferencing as a method of health care delivery for older adults in care homes. The review aimed to chart the following characteristics: the clinical purposes for which videoconferencing is being used in care home settings; the countries the research originates from; the research designs used; the types of data collected; and the main outcomes that the research sought to examine.

**Method**

The chosen review method was a scoping review [35]. Scoping reviews allow research to be mapped to explore what literature is available, to address a broad research question and establish whether or not a full systematic review would be worthwhile. It focuses on the breadth of research available on a specific topic [36]. This method was selected to identify the extent and nature of evidence currently available [37]. Arksey and O’Malley (2005) identified five key stages to a scoping review; these are as follows: (1) develop the research question; (2) identify studies; (3) select studies; (4) chart the data; and (5) report synthesised results [37]. These stages were followed to address the following research question: what is the extent and nature of available research evidence for videoconferencing as a method of health care delivery for older adults in care homes?

Search terms were identified for the target population and videoconferencing [36] by conducting a preliminary broad search to identify relevant keywords and terms. The terms were also informed by the inclusion/exclusion criteria, which were as follows.

*2.1. Inclusion.* Inclusion criteria were papers that focused on videoconferencing for older adults in care homes, nursing homes, long-term care facilities, and homes for the aged or in residential care.

*2.2. Exclusion.* Exclusion criteria were papers that focused on technical architecture or cost or were aimed at the treatment of people <65; where the article was not available in English; and where the full text could not be acquired. Abstracts were screened to exclude papers where the results were aggregated with those derived from other settings, so the findings for long-term care could not easily be extracted; this included reviews. Where there were duplicate papers of a primary study, only the paper that had the most comprehensive information was included. Opinion pieces were also excluded.

Databases searched were Embase, Medline, Web of Science, and Cochrane Library Reviews. This was followed by a refined search using keywords and terms that were identified through existing literature. When using the database search fields, key words used to define the care home population were limited to the main topic of the article, intervention terms limited to the title, and publication date from 2000 to present day; this was due to the initial search highlighting a lack of relevant research prior to 2000. Search terms used were as follows.

*2.2.1. Population.* Care home∗ OR Nursing home∗ OR Residential care OR Residential facility∗ OR Long term care OR old-age∗ home OR old age∗ home OR residential age∗ care OR long-term care.

*2.2.2. Intervention.* Video conference∗ OR videoconference∗ OR Video OR videoconsult∗ OR video consult∗ OR videoteleconferenc∗ OR video-teleconferenc∗

AND

Database/source

Search 1

Search 2

Total hits

Web of Science

15

994

979

485

Embase and Medline

495

10

Cochrane Review

281

282

1

CINAHL

108

979

1087

Reference searching

27

0

027

Literature from experts

4

0

4

*Total*

*2755*

*134*

*2889*

Duplicates

471

Assessed for title/abstract

2418

Full text assessed

390

Excluded 2028

Included

26

Excluded 364

Figure 1: Prisma of search results.

E-health OR telehealth OR telecare OR interactive health communication OR teleconference∗ OR teleconsultati∗ OR telemonitor∗ OR telepresence OR telediagnosi∗ OR telesurveillance OR technology enabled care services∗ OR digital health OR telemedicine.

Reference lists of included papers were searched for relevant further papers. Additional published evidence was identified by contacting experts in the field. Key experts at Airedale telehub (a provider of videoconferencing for care homes in North Yorkshire, UK) were contacted along with other sites that were known to have trialled videoconferencing in different contexts.

Of the included papers, 25% were checked by the second author, to validate the selection. The level of agreement was high, with only one paper being excluded as a result of validation. Both authors agreed that the paper did not fit the criteria for inclusion upon discussion.

**Results**

A total of 2889 articles were identified; duplicates were removed (𝑛 = 471) leaving 2418 to be screened by title and abstract (𝑛 = 2028 removed) (Figure 1). This left 390 to be screened by full text (𝑛 = 364 removed), resulting in 26 articles being identified for inclusion in this review.

Data were extracted from the papers based on clinical purpose for using videoconferencing, which countries the

Table 1: Papers grouped by clinical purpose of use.

|  |  |
| --- | --- |
| Clinical purpose of use | Papers |
| Assessment | 8 |
| Management | 5 |
| Clinical support | 2 |
| Diagnosis | 1 |
| Various | 8 |
| Not specified | 2 |
| *Total* | *26* |
| Table 2: Papers grouped by country of origin. |  |
| Country of origin | Papers |
| America | 12 |
| China | 5 |
| UK | 3 |
| Australia | 3 |
| Korea | 1 |
| Sweden | 1 |
| France | 1 |
| *Total* | *26* |

research originated from, the study design, type of data collected, and outcomes reported.

*3.1. Clinical Purpose of Use.* Table 1 shows the papers grouped by purpose of use. Eight papers reported the use of videoconferencing solely for health assessment, including wound assessment [38, 39]; assessing clinical changes in dementia patients [40]; general geriatric assessment [41]; assessments by allied health care professionals (dietetics, occupational therapy, physiotherapy, podiatry, and speech pathology) [42]; psychiatric assessments [43, 44]; and assessment of acute medical problems (mental status, abnormal laboratory values, or falls) [45].

Five research papers reported the use of videoconferencing for managing a clinical condition, through a health care professional based at a remote site, such as a hospital [46–50], for example, mental health problems [50].

Two papers did not specify the purpose of use; one used secondary data to establish what health care specialists/doctors had been contacted via the system [33] and the second examined the relationship between the care home and technology provider and how this influenced the outcomes of videoconferencing [51].

In two papers that described videoconferencing being used for clinical support [52, 53], advice was sought by professionals from the remote site, with one paper examining reduction of hospital admissions in residents with Chronic Obstructive Pulmonary Disease (COPD) [52] and the other describing the use of videoconferencing to access a range of health care specialists based at one hospital. Specialists included rehabilitation doctors and orthopaedic surgeons [53]. One paper assessed the use of videoconferencing for

Table 3: Designs of identified studies.

|  |  |
| --- | --- |
| Main designs | Papers |
| Case studies | 14 |
| Cohort | 5 |
| Repeated measures | 3 |
| Randomised controlled trials | 1 |
| Interviews | 1 |
| Observational | 1 |
| Cross-sectional | 1 |
| *Total* | *26* |

diagnosis and its effectiveness in identifying undiagnosed dementia in residents [54].

Eight papers recounted research that had evaluated the use of videoconferencing for more than one purpose [31, 32, 55–60], for example, both assessment and management [60]. Other combinations included assessment and treatment, patient education, management, and falls prevention [31]; diagnosis and developing a treatment plan [32, 56]; assessment and treatment [55]; assessment, review, prescriptions, and follow-up [57]; treatment, prescriptions, advice, referrals, and follow-up [58]; updating a remote team, reviewing care needs, and developing care plans [59]; follow-up and urgent review [60]; and teleeducation, telecounselling, and telemedicine [38].

*3.2. Country of Origin.* Table 2 shows the papers grouped by country of origin. Twelve of the identified papers originated from the USA [32, 38, 39, 43, 45, 48–51, 54, 55, 59]; five were from China [31, 44, 53, 56, 60], three were from the UK [47, 52, 58], and three from Australia [33, 42, 57]. The remaining three papers were from Korea [40], Sweden [46], and France

[41].

*3.3. Study Designs Identified.* Table 3 shows the breakdown of papers by study design. The most frequently reported method was case studies, with 14 of the papers describing the use of this design [31, 33, 38, 44, 45, 47–51, 55, 57, 59, 60]. Five cohort studies were identified looking at general practitioner adherence to assessments undertaken during consultations [41], videoconferencing for the diagnosis of dementia [54], and the use of 24-hour consultations [52] and for the care of dementia patients in Korea [40] and one looking at the implementation of videoconferencing in long-term care [53]. There were three studies that used repeated measures, comparing face-to-face contact with videoconferencing [42, 43, 56]. One compared psychiatric assessments [43], another allied health assessments [42], and a third considered podiatric intervention [56]. There was only one randomised controlled trial that examined whether videoconferencing could reduce hospitalisations [39].

*3.4. Type of Data.* Table 4 shows the types of data collected in studies included in this review. The most popular, in 12 studies, was the combination of both qualitative and quantitative data [31, 32, 38, 40, 42, 44, 45, 49, 55–57, 59]: 7

Table 4: Data reported in papers.

|  |  |
| --- | --- |
| Type of data | Papers |
| Qualitative and quantitative | 12 |
| Quantitative only | 10 |
| Qualitative only | 3 |
| Clinical outcomes only | 1 |
| *Total* | *26* |

Table 5: Papers grouped by outcomes examined. Papers may appear in more than one category if they discuss more than one of the following.

|  |  |
| --- | --- |
| Outcomes | Papers |
| Staff satisfaction | 9 |
| Resident satisfaction | 8 |
| Cost | 8 |
| Resident outcomes | 7 |
| Admissions | 6 |
| Feasibility | 6 |

of these included a satisfaction questionnaire and qualitative clinical data [31, 32, 38, 42, 45, 56, 57] such as care records [32] or care plans being reviewed [42]. One paper used clinical outcome scales and observation [49].

Ten of the papers used purely quantitative data [33, 39– 41, 47, 50, 52–54, 58]. Secondary data included the use of postcode data to compare admission rates between care homes with and without telemedicine [58] and papers that reported on consultation records and electronic billing [33]. One collected primary data and secondary data to look for trends in areas such as cost reductions [55]. One paper collected routine data and compared non telemedicine users to telemedicine users to look at admission rates and cost [39] or to compare to other models of long term care [53].

Three of the studies were completely qualitative in nature [46, 48, 51]. For example, one interviewed nursing staff and explored factors that increase the perception of presence [46].

One used only clinical outcome measures [43], aiming to establish whether or not psychiatric assessments could be carried out reliably using videoconferencing [43].

*3.5.Outcomes.* Table 5 shows papers which examined a broad range of out comes relating to videoconferencing. Most papers considered staff satisfaction when using videoconferencing, with nine papers referring to this in their findings [32, 38, 44, 45, 48, 50, 56, 57, 60]. Eight papers addressed resident satisfaction [32, 38, 44, 45, 48–50, 56, 57, 60], with another eight examining the effect on cost [39, 44, 49, 52, 55, 58– 60]. Four of these considered how reduction in admissions reduced cost [39, 52, 58, 59], one addressed how reduction in admissions and in transportation costs to A&E had reduced cost [60], two reported on how reducing visits to outpatient clinics affected cost [44, 55], and one paper considered at how improving the management of Parkinson’s through videoconferencing reduced cost spent on medication to manage the symptoms and transportation costs to outpatient clinics [49]. Further seven papers addressed resident outcomes [32, 40, 45, 49, 53, 58, 59]; six examined changes in admission rates [39, 52, 53, 57–59] and feasibility of use [31, 38, 42, 44, 50, 60]. Outcomes that were present in three papers or less were excluded from this table.

**Discussion**

The purpose of this review was to identify the extent and nature of research evidence for the use of videoconferencing as a method of health care delivery for older adults in care homes.

This review identified videoconferencing as being most frequently used for clinical assessment, either on its own [38– 45], or in combination with other applications [31, 32, 55–60]. There are a wide range of other applications that need to be explored further in future research. For example, this paper highlights a lack of research on the use of videoconferencing for clinical support [52, 53] and diagnosis [54]. Research addressing how the needs of older adults living in care homes affect the range of purposes videoconferencing is used for would also be beneficial in determining how best to apply videoconferencing to meet residents’ needs.

The majority of research originated from USA [32, 38, 39, 43, 45, 48–51, 54, 55, 59] and China [31, 44, 53, 56, 60] and three were from Australia [33, 42, 57]. These countries may be more invested in researching videoconferencing, due to the fact that they have large, sparsely populated areas, where remoteness and increased travel time make conventional services more difficult to provide. This may mean that services are more difficult to access and community services may be more challenging to provide, due to the time it would take to travel to remotes services or care homes, in addition to the cost of travelling [47]. Research from other countries was limited. There needs to be more research globally, to gain a better understanding of how videoconferencing would work in different contexts, as the research identified in the review may have limited generalisability to other countries [61].

This review found that very little population-based evidence is available about the use of videoconferencing, with 20 of the papers describing small scale studies, recruiting just one care home [31–33, 38, 42–51, 53–56, 59, 60]. There were only two large studies [52, 58], one of which included 14 care homes [52] and another which included 50 care homes (23 homes without telemedicine, compared to 27 with telemedicine) [58]. In the other studies, recruitment ranged from two to 11 care homes [39–41, 57]. This suggests that research into videoconferencing for remote health care provision in care homes is still in its infancy globally. Additionally, a lack of large controlled studies makes the findings hard to generalise [62].

The most frequent type of data identified in this review was a combination of quantitative and qualitative data (mixed methods) [31, 32, 38, 40, 42, 44, 45, 49, 55–57, 59], suggesting that many studies found it important to look at a range of clinical outcomes as well as exploring stakeholder experiences of using videoconferencing. Although using mixed methods can help address a broader range of research questions and may be unable to capitalise on the strengths of both methods, unless carried out by a large research team, the value of mixed methods approaches requires further investigation. Thus, more purely qualitative or quantitative research may be beneficial to get a more in-depth or broader understanding than may be possible when trying to balance the two approaches [63]. There were only three papers that were completely qualitative in nature [46, 48, 51] meaning that more robust qualitative studies are required, to determine how experiences of using videoconferencing may vary geographically and by purpose of use.

The most frequently reported outcome was staff satisfaction, with fewer looking at resident outcomes or the feasibility of videoconferencing. This suggests that one of the main motivating factors for videoconferencing implementation is to improve staff satisfaction. More robust studies in this area, in addition to further exploring how resident satisfaction and the feasibility of videoconferencing may vary by context, would be beneficial.

The findings from this review highlight a need for more research exploring clinical purposes for videoconferencing in care homes such as for rehabilitation [64]. More research also needs to be conducted globally to get a better understanding of how videoconferencing might work within different clinical and geographical contexts and with different populations of care home residents. Larger controlled trials would help identify the effectiveness of videoconferencing for improving resident’s health care. Additionally, more theory driven research is required to identify the mechanisms for change that lead to successful implementation of videoconferencing in care homes. Research designs that have a greater emphasis on rigorously conducted qualitative research would also be useful in terms of getting a more in-depth understanding of the user experience, particularly around resident outcomes and to look more specifically at the reliability and feasibility of videoconferencing in care homes.

**Limitations of the Review**

Resources restricted the extent of cross validation of papers for inclusion.

**Conclusions**

It is evident from undertaking the scoping review that a systematic review would not be fruitful due to the lack of rigorous studies [37].

The findings show that there are a wide range of applications for videoconferencing technology in care homes, with the most common being for assessment of resident health. Additionally, most of the research was identified as originating from countries that have large, sparsely populated areas.

In order to understand the contexts and mechanisms that lead to successful implementation of videoconferencing in care homes, more vigorous studies need to be undertaken to start to understand outcome patterns that will lead to success or failure of videoconferencing within care homes in different contexts globally.

**Disclosure**

The views and opinions expressed are those of the author(s) and not necessarily those of the NHS, the NIHR, or the Department of Health.

**Conflicts of Interest**

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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* 1. Appendix 2 – RaRE approach

Week 6 Evaluating – part 2 – Strategies

Welcome to Week 6 of RaRE. This week we continue our focus on how to evaluate the evidence once you have found it.

Introduction

Hello and welcome to Week 6 of the RaRE course. Please begin by watching the introductory video for this week.

watch this videoWatch this video (YouTube)  
[(Watch this video on YouTube)](https://youtu.be/ekqcCSpBtqw)

Welcome to Week 6 of the FOLIO Course (and welcome back to those of you with prior experience who fast-forwarded through Week 5!). This week we continue our focus on how you evaluate the evidence once you have found it. Last week we learnt that this is a critical stage of scanning and synthesis with a major role in building confidence in your evidence product. We also identified four different ways of assessing the evidence and last week we focused on the most rigorous and time-consuming method – full checklist-based critical appraisal. This week the entire group will examine the three remaining approaches and try to come to a view of their comparative strengths and limitations. The three remaining approaches are:

methodological limitations – using information from the authors of the studies themselves to identify weaknesses;

assessing the body of evidence – identifying shared study design weaknesses across a set of included studies;

quality of reporting – assessing studies only in terms of what they actually report without making judgements on the appropriateness of what has been done.

While many of this week’s examples are underpinned by our own experience within a health research context we hope that you will recognise that these methods are generic and apply equally to studies from other disciplines, especially where these use similar study designs.

6.1 – Methodological limitations

**Using Authors’ own acknowledged methodological limitations**

One approach to quality assessment, one that removes some responsibility for the one producing the summary, is to use the authors’ own acknowledgements of the limitations of their study. All **Discussion** sections of original research articles or systematic reviews should offer a subsection on **Limitations of the Study**. For example, the BMJ requires authors to cover the following in the **Discussion** Section of a Research Article:

Structured discussion

Please ensure that the discussion section of your article comprises no more than five paragraphs and follows this overall structure, although you do not need to signpost these elements with subheadings:

Statement of principal findings

Strengths and weaknesses of the study

Strengths and weaknesses in relation to other studies, discussing important differences in results

Meaning of the study: possible explanations and implications for clinicians and policymakers

Unanswered questions and future research

While it may seem risky to rely on authors to signal the limitations of their own study there are compelling arguments for using this information within the context of an evidence summary:

A good study always provides enough information for the reader to assess its strengths and limitations. Conversely, if a study has no reported limitations then the author is either being dishonest or lacks a measure of critical self-awareness – either raises questions about the value of the study itself.

Authors are pressured to acknowledge the limitations of their own study throughout the peer review process. This is recognised as an important function of the peer reviewer. Indeed if the first submission does not acknowledge any limitations at all it increases its chances of being rejected. By extension if a published study does not acknowledge its own limitations then it casts doubt about how robustly it has been peer reviewed – another reason for challenging the value of the study.

When writing a summary you do not claim that self-reported limitations are the only weaknesses of the study – you simply frame these as “reported weaknesses/limitations of the study”. You would neither ignore this potentially useful information completely nor would you claim this as your own observations or assessment. This approach is one of the “protective mechanisms” referred to at the beginning of Week 5.

As we will see in the next section (6.2) Limitations acknowledged by one author may be generic and therefore have value when looking at other studies of the same type. A group of related studies may therefore partially serve as a self-regulating “college” whereby individual authors partially reveal their own flaws and, by doing so, contribute collectively to an overall assessment of the evidence base.

[The BMJ PICO Summary Approach](http://www.bmj.com/content/337/bmj.a2946)

The experimental BMJ PICO Summary approach (see link above) offers a possible model for your own Evidence Briefings or Summaries. Please note that it includes a section on Limitations (e.g. the following exemplar):

“**Limitations of study** The missing quality of life data add to uncertainty around the QALY estimates, and the authors emphasise the importance of considering all outcomes when drawing conclusions. Also, the data on lost productivity were incomplete and were not used in the comparative analysis. The study design, as a factorial analysis, creates difficultly in interpreting the economic evaluation, and individual group analysis was therefore used to present the main findings. The payments to teachers and therapists for the interventions may not be generalisable, but, as they were at the upper end of commercial rates, the results are conservative.”

No formal comparison has compared a Limitations-based approach to formal critical appraisal. A recent example of the Limitations-based approach is found in the ScHARR report on Heart Surgery in England: *What evidence is there for a relationship between organisational features and patient outcomes in congenital heart disease services? A rapid review.* (see link below):

[ScHARR report on Heart Surgery in Children](http://www.nets.nihr.ac.uk/__data/assets/pdf_file/0017/118511/HSDR_WR1_13-05-12.pdf)

In addition to some questions that related to “quality of reporting” [See 6.5] (and consequently the “usefulness” of included studies in answering the review questions) this review describes the following approach:

“Assessment of the limitations of included studies was also undertaken using the limitations reported by study authors in the included studies.” (p.11)

The important point to note is that neither of these approaches to quality assessment (i.e. Focusing on the Methodological Limitations and Quality of Reporting) require technical skills in formal critical appraisal (even though the review authors did have these skills if required). As such these two approaches are well within the typical skill set of most librarians. A further point is simply to signal the irony that, in a conventional systematic review that focuses on the Methods and Results sections of included papers, the otherwise useful information contained specifically within the Limitations subsection of the Discussion Section is very often part of the study that is, at least metaphorically speaking, thrown away!

**Activity 1**

activity stage

**Use your reflective diary**

Take a look at the limitations section of any published research article. To what extent do the reported limitations capture the quality of the published study? Can you spot any other limitations not flagged up by the authors? Record your reflections in your journal.

6.2 – Assessing the body of evidence

*The two approaches to quality assessment covered so far (i.e. Full critical appraisal and focusing on the methodological limitations) emphasise the characteristics of individual studies. The following approach turns the emphasis to the collective body of evidence.*

Typically a particular research question can be answered by a limited number of research designs. For example, an effectiveness question always requires a **comparative design**. Without a comparison you cannot conclude whether an intervention is effective or whether what happened would have taken place anyway. Because a case study has no comparison we cannot argue that something works just because an author reports that it worked in their single setting.

Beyond the minimum requirement of being comparative we can add further requirements to distinguish between different comparative designs. For example did the groups being compared start on a level playing field? Were they treated equally through the study, apart from the intervention being evaluated? Was the data collected prospectively or retrospectively? Were the outcomes measured objectively or subjectively? In all these cases the quality of the study is related simply to its design. Of course the presence of these features does not in itself guarantee the quality of the study – we cannot say that a randomised controlled trial is always good quality just because it is a randomised controlled trial. However if a comparative study is not randomised then it does perform more poorly than one that has been randomised – and if a study claims a particular study design and the features we are expecting are missing or poorly described then we may suspect it has not been performed very well.

An Illustration: Have you ever played the game Twenty Questions (Animal, Vegetable, Mineral)? This involves guessing the identity of a thing that your partner has thought of. Choosing the right questions increases the likelihood of guessing the item correctly. In fact even asking Animal, Vegetable or Mineral eliminates millions of possible responses at one go! The power of these branched questions is such that a cheap electronic toy is able to guess correctly a large number of alternatives (See [20Q.net](http://www.20q.net/)).

The good news is that there are infinitely fewer different study designs than there are Twenty Question objects! Well-chosen branching questions not only exclude a large number of alternative study designs but can generate generic responses for critical appraisal. For example, in answer to the question “Is data collected retrospectively or prospectively?” then the response “retrospectively” leads one to flag up the possibility of “recall bias” or of “inaccuracy or incompleteness of records”. Using this single response I am prompted to consider these issues for any study that subsequently describes itself as “retrospective”.

An application of Assessing the Body of Evidence

For a report to inform UK Alcohol pricing policy (Booth et al, 2008) we identified two main types of study: (i) Natural Experiments – where a country changes its alcohol policy and researchers measured the impact and (ii) Modelling studies – where statistical modellers use various estimates and assumptions to predict what would happen if a policy was changed. The first type of study is limited because it takes place in an uncontrolled environment and so other things may have been going on as well as the change of policy. We cannot be confident that the change in policy causes a change in alcohol consumption. The second type of study is limited because it relies on certain assumptions about what might happen. A change to any single assumption can potentially have a dramatic effect on any predictions. Both types of study are limited by time and space i.e. the natural experiment happens at a particular point in time in a specific country and the modelling data is taken from a particular time point and setting.

The important point is that, rather than commenting on the limitations of each individual study, we were able to comment on the shared limitations of each study type thus speeding up the quality assessment. In addition if one study flags up additional limitations (see 6.1) we were also able to look for other studies that shared that limitation. As a consequence we were able to deliver the rapid review in a fraction of the time required to perform full critical appraisals.

**Activity 1**

*Suggested duration:*

activity stage

**Use your reflective diary**

Can you think of any limitations to an approach that uses generic study level features as the basis for quality assessment? How would you explain and justify this approach to a potential evidence user? Record your reflections in your journal.

6.3 – The CEBN Design Tree

*As we mentioned in 6.2 it is possible to use a decision tree or algorithm to identify a particular study design as reported in a paper. Once you have identified the study design then, with the aid of some study design crib notes you have a ready-made generic approach to critical appraisal. As also previously mentioned this week, this does not necessarily distinguish between a good randomized controlled trial and a poor one if they are both fully reported. In such a case, or if studies with the same design come up with very different results, then you would have to resort to full appraisal anyway.* ***We would now like you to look at three study design decision aids and to come to a decision as to which one you would prefer to use.***

The three decision aids are:

[The CEBM Design Tree](http://www.cebm.net/study-designs/) – this tree of possible designs, branches into subgroups of study designs by whether the studies are descriptive or analytic and by whether the analytic studies are experimental or observational.

[The Introduction to Study Design](http://www.cebm.net/wp-content/uploads/2014/06/CEBM-study-design-april-20131.pdf) by Jeremy Howick – this decision aid incorporates thinking from a very useful series of articles on study design published by Grimes & Schulz in the Lancet in 2002.

Methods for the development of NICE public health guidance (third edition) – Appendix E [Algorithm for classifying quantitative (experimental and observational) study designs.](https://www.nice.org.uk/process/pmg4/chapter/appendix-e-algorithm-for-classifying-quantitative-experimental-and-observational-study-designs) This algorithm is to be used by systematic review teams when conducting reviews of public health interventions. Unlike the previous two examples it is specifically for use when reviewing the literature.

**WHAT YOU NEED TO DO:** Examine each of the three decision trees (algorithms) for categorising evidence. Which decision tree would be most useful to you when trying to categorise research designs and make judgements on generic study quality?

You may find it helpful to try using each guide for the same paper (preferably not a randomised controlled trial design). Characteristics to influence your preferred choice:

1. How understandable is the terminology?

2. How helpful is the diagrammatic representation?

3. How clear are the choices presented at each decision node (junction)?

4. How comprehensive is the decision tree in terms of coverage of study designs?

5. How helpful are the supporting notes and documentation? Now record your decisions at the following quiz location:

**→** [Study Quality Quiz](http://goo.gl/forms/7Cw7Pn2gOc)

6.4 – Rapid review case study

*In this section we introduce you to a case study of a resource that has specifically been set up to scan and synthesise the evidence. It involves trained information professionals in conventional roles, such as protocol design, information retrieval, management of a reference management database and document delivery, but also in extended roles such as study selection, data extraction, quality assessment and report writing.*

**The Sheffield HS&DR Evidence Synthesis Centre**

**Background:** The UK National Institute for Health Research (NIHR) is a national health services research organisation that commissions and funds research from the laboratory to the bedside; from the community to the operating theatre and from the cradle to the grave. Specifically, one of its major funding programmes, the Health Services and Delivery Research (HS&DR) programme, funds research to improve the delivery of services within health and social care. Health services typically involve complex processes, making services challenging to evaluate. Research evidence in these topic areas is diverse and complex, difficult to identify and spans the spectrum of study designs. High quality evidence syntheses provide the best possible information about interventions used in health and social care. These syntheses apply explicit, pre-specified and objective methods to identify, evaluate and summarise the available research. The HS&DR programme has commissioned two national Evidence Synthesis Centres (the other is at the University of York) to provide timely and contextualised access to the best evidence on selected topics.   
Further details at: <http://www.nets.nihr.ac.uk/projects/hsdr/130512>

While this Evidence Synthesis Centre model exists within a context of health research it has been mirrored in other sectors - for example, by the What Works Clearing House (U.S.) in Education (<http://www.w-w-c.org/>) and the What Works Network in the UK ([https://www.gov.uk/guidance/what-works-network#the-what-works-network](https://www.gov.uk/guidance/what-works-network#the-what-works-network%20) ). Can you think of similar initiatives in your own context?

**Design:** The HS&DR programme identifies knowledge gaps and commissions syntheses in strategically important topic areas. Each topic requires synthesis of key evidence and a summary of the quality of information and the strength of findings.

**Outputs:** An exciting feature of the Evidence Synthesis Centres is that each review question requires a specifically designed evidence synthesis product suited to its purpose involving experimentation with review methodologies.

**The following table illustrates this diversity within the first year of operation:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Timeframe** | **Product** | **Methodology** |
| Heart Surgery for Children | Three Months | Validation and Update of previous review | Citation tracking and keyword searching. Quality assessment for usefulness and Study Limitations |
| Nursing Staff Mix | One Week | Scoping Paper of recent research and research in progress with Internet enabled links | Recent publications, Internet searches of known researchers and research units; Conference sites |
| Group Clinics | Four Months | Rapid Systematic Review | Mapping previously included studies from 12 reviews; successive fractions searching for step-by-step sifting; Citation searching; Cluster searching |
| Urgent Care Priorities | Four Months | Mapping, Evidence Review and Framework synthesis | Coding studies to five strategic themes from Policy document |
| Moving Diagnosis into the Community Centres | Two months +  Four-Six Months | (i) Mapping Review  (ii) Series of Focused Reviews in Specific Topics | Two phased mapping of existing Systematic Reviews and Trials; followed by Narrow focused Systematic Reviews |

The above table indicates the range of products for which skills in rapidly reviewing the evidence can be used. Once the requisite skills are present in the team then appropriate methodologies and products can be developed for each specific purpose – thereby opening Pandora’s Toolbox!

6.5 – Quality of reporting

*Information professionals are not always comfortable about assessing the quality of published research. As we have seen this understandable caution need not be an obstacle provided that you establish “fitness of purpose” and manage user expectations appropriately. In this section we look at a method of quality assessment that sidesteps judgements of study quality by focusing only on the quality of reporting.*

Many organisations already assess the quality of reporting of a study alongside more formal critical appraisal procedures. So, for example, the Database of Abstracts of Reviews of Effects (<http://www.crd.york.ac.uk/CRDWeb/AboutPage.asp>) assesses what should have been reported as well as assessing how well a study has been conducted. The former is simply a natural extension of traditional informational professional skills, the latter will require specialist appraisal training. The following is an example of a Centre for Reviews and Dissemination (CRD) commentary on a systematic review of knowledge management. Items highlighted in **Bold** relate to **quality of reporting**. Items in *Italics* probably require more advanced *critical appraisal skills* (as signalled by the use of the word “appropriate”):

Centre for Reviews and Dissemination (CRD) **commentary**

**The review question was clear with broadly defined inclusion criteria. A range of relevant sources were searched without restriction on publication status. However, limitation of inclusion to studies in English meant some data may have been missed. A study quality assessment was undertaken and results were reported in full.** *Appropriate methods to reduce reviewer error and bias were undertaken throughout the review process. A narrative synthesis was appropriate given differences between studies in terms of knowledge translation strategies, implementation and study conduct. The authors appropriately state the results should be interpreted cautiously due to these variations.* **The authors’ conclusions reflect the paucity of evidence in this well-conducted review and are likely to be reliable.**

Centre for Reviews and Dissemination, University of York.

**Activity 1**

*Suggested duration:*

activity stage

**Use your reflective diary**

To what extent do you think a commentary written along the lines of that highlighted in Bold in the example above would meet the needs of your particular user groups? Could you possibly deliver a service based simply on quality of reporting? Would your users find such a service valuable? Record your reflections in your journal.

In the specific context of qualitative research we have developed a tool, tentatively labelled the QUAlity of Reporting Tool (QUART) that only examines quality of reporting (Carroll et al, 2012). The QUART tool recognises that not all synthesis teams will possess specific skills in qualitative research and that team members may be more comfortable simply describing what methods were used rather than evaluating whether or not they are appropriate.

In practice you could rewrite the first few questions on a CASP quality checklist to focus only on the quality of reporting to include (a) Is the particular item reported? and (b) Does the author justify how s/he performed the item? In health care an increasing number of reporting standards are used to describe how a study should be formatted and reported when being published (<http://www.equator-network.org/>). Some reviewers choose to use relevant reporting standards to assess how completely each individual study has been reported. Such an approach is acceptable so long as the review team makes clear that completeness of reporting, not study quality, is the focus of their assessment. This final point recalls our earlier discussion about the use of author reported limitations in quality assessment.

In Weeks 5 and 6 we have looked at four methods of quality assessment:

full critical appraisal

methodological limitations;

assessing the body of evidence;

quality of reporting.

Of these four methods full critical appraisal (i) is most time consuming, requires greatest expertise and is most valued. Using reported methodological limitations (ii) and the quality of reporting (iv) require comparatively less individual interpretation. They have a signposting role in that a reader may ultimately still need to view the full text article when following up an initial judgement on whether the item is worth reading. Assessing the body of evidence (iv) does require that you build up knowledge on study design but you can focus on generic points on a decision tree and not generate insights from scratch for all studies.

In the past we have experimented with using a single page of prompts for rapid critical appraisal (entitled Pretty Darned Kwik). Although these tools were found to be helpful and user-friendly, they still required a detailed knowledge of the full appraisal process making it difficult to fast-track the quality assessments. Just because an appraisal tool is brief does not mean the appraisal process will be correspondingly rapid! However it is certainly helpful to develop ever improving tools to enhance the appraisal process. For example Peninsular Medical School [use a critical appraisal tool](http://clahrc-peninsula.nihr.ac.uk/uploads/attachments/MSE/Critical_Appraisal_of_an_RCT.pdf) that points the reader to where to look within the paper. However, if we want to speed up quality assessment we must pursue genuine alternatives to critical appraisal (such as methods 1-4) and not seek simply fast-forward formal appraisal verdicts.

6.6 – Further reading

Reeves BC, Deeks JJ, Higgins JPT, Wells GA. Chapter 13: Including non-randomized studies. In: Higgins JPT, Green S (editors), Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (updated March 2011). The Cochrane Collaboration, 2011. Available from [www.cochrane-handbook.org](http://handbook.cochrane.org/)

This chapter of the Cochrane Handbook is a very useful summary of the most common non-randomized study designs. Of particular use for reference purposes is the pair of tables that identify the features of each of 20 different study designs.

6.7 – References

Booth, A., Meier, P., Stockwell, T., Sutton, A., Wilkinson, A., Wong, R., ... & Taylor, K. (2008). Independent review of the effects of alcohol pricing and promotion. Part A: systematic reviews. In Independent review of the effects of alcohol pricing and promotion. Part A: systematic reviews. University of Sheffield. [https://www.shef.ac.uk/polopoly\_fs/1.95617!/file/PartA.pdf](https://www.shef.ac.uk/polopoly_fs/1.95617%21/file/PartA.pdf)

Carroll, C., Booth, A., & Lloyd-Jones, M. (2012). Should we exclude inadequately reported studies from qualitative systematic reviews? An evaluation of sensitivity analyses in two case study reviews. Qualitative Health Research, 22(10), 1425-1434.

Turner J, Preston L, Booth A, O’Keeffe C, Campbell F, Jesurasa A, et al What evidence is there for a relationship between organisational features and patient outcomes in congenital heart disease services? A rapid review. Health Serv Deliv Res 2014;2(43) <http://www.journalslibrary.nihr.ac.uk/hsdr/volume-2/issue-43#abstract>

9.3 Appendix 3 - special interest group (SIG) Report

**The pros and cons for technology in care homes**

**Introduction**

Professor Gail Mountain started the day by introducing CLAHRC and that the aim was to make dialogue with attendees and raise awareness of Louise Newbould’s study in pack.

She went on to explain that there’s not a lot of technology is used in care homes currently, beyond ‘telecare’ alarms etc…. Research on this is not great (not a large evidence base)and there’s a need to transform services. New ideas are needed alongside research and networking as well as talks.

HereLouise Newbould introduced her PhD, which is funded by Abbeyfield to look at factors affecting effectiveness of technology in care homes and requested support from attendees to respond to the survey going out to care homes across Y&H later this year.

**Enhanced Community Palliative Support Systems, Dr Steve Ariss & St Luke’s Hospice**

Patrick Blanshard (CEO of sensory technologies) first started this project, when he came to talk to some second year students.

The current model of palliative care is nurse to patient in their own home and nurses having to move around to wherever they can get to. However, this has problems as it couldn’t be scaled up as well as also being costly and inefficient. Example of Western Ontario was then discussed. Some challenges faced included problems getting them where they needed to be, the area being covered is as big as Sheffield to Portsmouth. They wanted to prevent patients going into hospital and readmission, they started off with full shifts in paediatric care, but this is delivering hospital care at lower level cost.

Care Model aimed to: -

* Leverage capability of specialist nurses
* Use of delegated acts between RN and Care Techs/PSWs with enhanced training
* Care Techs/PSWs trained in specialized medical interventions and clinical data collection
* Nurse works remotely Monitoring, Mentoring and Managing multiple patients through the Care Tech/PSW
* Safely and cost-effectively moves patients home

So in the new model there is a delegated nurse then the palliative support worker who is the ears, eyes, hands of the nurse in the patient care. They are currently scaling it up and would like to test it in care homes. It is believed that technology is a useful way of supporting the circle of care as lots of people who can plug into technology at different levels.

How the model works is by the support worker having a phone/ tablet. They then log in and complete tasks described, they can also monitor patient’s vital signs. There are various different outputs available and it is currently being ruled out to different geographical areas. Findings in Canada/ US showed a <2% hospital readmission.

In the UK setting, the Palliative and End of Life Care Setting Partnership collaboration and other organisations have identified key questions and an implementation network was made to try out these ideas. These are:

* What are the best ways of providing palliative care outside of working hours to avoid crises and help patients stay in their place of choice?
* How can access to palliative care services by improved for everyone regardless of where they are in the UK?
* How can it be ensured that staff (including health care assistants) are adequately trained to deliver palliative care, no matter where the care is being delivered?
* What are the best ways, of providing care in the patient’s home and how can home care be maintained as long as possible? Does good coordination of services affect this?
* What is the best way to make sure there is continuity for patients at the end of life, in terms of the staff that they have contact with, and does this improve quality of palliative care?

Network developed in UK of palliative care providers and commissioners called CLARCH YH.

Network applied to nursing technology fund for evidence of effectiveness.

In the UK £50K was used at St. Luke’s in Sheffield. They did a simple case study, which was theory led and used developmental evaluation. They looked at pre-post service delivery and economic models.

Staff here stated that behind this technology there’s loads of potential for use as there is an increasing amount of pressure to put palliative into the community and there’s a short fall in nursing, with many patients having needs that can only be met in hospital, so this makes it a complex task.

There is a drive coming from national initiatives and policies, all high level on NHS documents that specify many operational requirements and it needs to be considered how this level of care can be delivered with resource constraints currently in end of life care.

6 Key features were mentioned:

Five year forward end of life care priorities

1. Each person is seen as an individual
2. Equal access to care
3. Maximising comfort and wellbeing
4. Community prepared to help
5. Staff able to deliver care
6. Care is coordinates

Technology is acting as a catalyst for us to deliver elements.

It is believed that patients can be objectively managed through PROMs if we can train assistant practitioners, carer or patient to report themselves. The project then posed the question: ‘Why can’t we develop models of reinforced caregiving?’ Stating many may argue it’s a threat to healthcare professionals, but that need is exponentially increasing and technology can help professionals leverage expertise.

This technology is in use in Canada, but it is difficult for care homes to deliver training due to high turnover and rate of staff. There needs to be a high level of planning and to be able to have a centralised trained individual via technology, but could be delegated to any health care professional. However, one challenge in care homes in delivering necessary levels of training, due to high turnover of staff. If apps can be utilised and you can have trained assistant practitioners in the care home you can delegate those out. It requires a high level of strategic planning, interaction and negotiation and poses the question: ‘As a practitioner would you be happy delegating care to other professional?’ However, if proper training/ supervision is delivered the technology can work, as shown by the work in Canada.

However, one worry was that technology might obstruct relationships with the patient, but from experience in Canada presence of phone went unnoticed. The patient was delighted to have someone skilled with capacity to deliver care. They are now looking for partners to develop technology and programmes in the US working across organisations. Now looking at cross organisational working too.

Q&A

*[Unfortunately the Q&A session is missing from the recording, but from the notes made this is what was recovered]*

* Testing is starting in January with band 5 nurses and assistant practitioners in a hospice. The system is said to reinforce caregiving and providers are working with ScHARR and CLAHRC.
* It was stated that caregivers shouldn’t give treatments, but they want to and this is a project the team would like to take on.
* It’s not about deskilling senior nurses; it’s about good allocation of resources.
* One attendee believed it was revolutionary
* St Luke’s homes are over- stretched due to a deficit in nurses and in situations where the carer or relative could give insulin etc… it may help ease up on workload.

**EnRiCH, Vicky Murray**

Vicky promoted an event being organised by Enabling Research in Care Homes (EnRiCH) in South Yorkshire and tried to encourage researchers, care home managers etc… to attend to help develop best practices.

**Electronic recordings in care homes (ERiCH), Pam Enderby**

Pam started off introducing the team that also works with Data Capture Company.

Pam started off by stating that there are an increasing number of people requiring care homes and their care needs are becoming more complex. It is currently estimated that 376,000live in around 10,300 care homes, with most people have at least 3 health requirements. Regulators are pushing for better documentation, so there is an increasing amount of pressure on staff and it reduces the time spent caring/ the face to face work with residents. Regulatory control is alerting people to negative aspects of care homes and many care workers don’t have English as their first language. It is estimated that 20% of time spent on paper work in care homes. She poses the question ‘Can technology help?’.

Current record keeping is not standardised and is generally kept on paper in a range of locations. There are issues with this current system, these are; residents records often unavailable, difficult to navigate, sometimes duplicated information, difficult for monitoring and reporting, are bulky and hard to store (need to be stored for 7 years) and have limited potential for research. With current record keeping, when the CQC come it takes 2 weeks to sort out paperwork and preparations. Likely to result in; omissions, liability, errors, Inappropriate and unsafe care practices, duplication, increase financial and ecological costs, data that’s not useful to understand and improve care. They wanted to take a bottom up approach to developing an electronic filing system.

They went through a staged process;

Phase 1 – scoping Project

Phase 2 (Present) – ERiC system prototype development and trial (Feb – Dec 2015)

Phase 3 – Live full trial ERiC system in care homes (Oct 15- Proposed)

Phase 4- Open availability for general use

Phase 5- Ongoing research and development

They aimed to develop something that works and is flexible, to meet the personalities of a range of care homes; one size does not fit all. It has to be able to be amended according to their philosophy.

This project wanted to try out different things interactively to see what worked.

Phase two of which involved collaborating with service user groups and steering groups to get their views on data being held electronically. They also engaged with regulatory authorities such as; the CQC, Sky, CCG and local authority.

Engagement was done through Interviews, focus groups and examination of records. They learnt that priorities change over time, which reinforces the need for flexibility.

Outputs from phase 2:

* Report on current paper use in practice/ what type?
* Report on the prototype trial to develop better system
* Develop an implementation tool
* Begin economic modelling of system

This research found that 22% of staff time was spent on paperwork, but nurses felt in reality this is actually longer. A reduction in half of this time would be a massive improvement.

Research asked: ‘Which technology formats are most use and interest to potential users? Tablets? Phones? What’s of use and interest to different users?’

They tried tablets with and without Wi-Fi and different platforms and there was an interest in using phones with apps.

Web- based forms of devices allow both online and offline data collection. Forms have been made for Background and basic care plan details.

Things such as updating the next of kin can be date stamped and easier to find on electronic records than paper in the event of an emergency.

An example was given for the need for a system to alert staff to missing time intervals when turning residents to prevent pressure ulcers. Sometimes turns are missed due to incidents occurring in the home. So an alert system would improve care and is safer for those involved.

Prototype testing – They asked what staff thought about it and what they thought would be helpful. They liked the idea of portability; they wanted medium size, read only devices in residents’ bedrooms that would alert to anything that was important for the patient that day and larger devices in communal areas.

In general they thought that accessing and formatting the forms was good, they liked the options in drop down boxes so that people didn’t have to remember how to spell something.

Also, looking at records to help with handovers/ alerts, pre saves a lot of data so you don’t have to start forms from scratch.

The pros to using a Windows Surface tablet:

* Removes need for a full size PC
* Ability to enter detailed information
* Up to date information on resident file
* Not restricted to desk

The cos to using a Windows Surface tablet:

* Wi-Fi dependent (some homes don’t have)
* Would need to be charged
* Would need to be secured by security lock cable

They said they are currently working with Anchor and some GPs and thanked everyone involved.

Q&A:

*[Could not capture question on recording], but note’s suggested the delegate asked about how residents views were measured to help regulators assess the intervention.*

Pam also works in outcome measures and it would be possible to have the smiley face grumpy face to look at issues at a later stage and thinks it would be very helpful so residents can record their views as well as just the care assistants views. It is an issue that they want to be able to catch everything on one record; they need to weight what is important and the persons experience is of most importance and how we can capture that we need to look at through technology. Sometimes a care assistant will sense someone’s not having a good day and that sort of capture is quite important.

Additional comment: Pam’s PhD student did PhD looking at high turnover in care staff and one of top 3 reasons was the paper work as well as low levels of literacy

**Use of iPad in care homes for communication and leisure, Dr Sarah Smith**

Sarah is part of a team led by Arlene Astall looking at psychosocial interventions with touchscreens to promote communication and leisure activities in CATCH. Looking at how touch screen technology can be used to promote communication and leisure activities.

She started by stating 850,000 people in the UK live with dementia, which costs £30,000 per person per year and only £90 per person a year spent on research in to it.

Seven out of 10 people with dementia also have other long term condition which makes staying at homes difficult. Also psychological problems can manifest as a result resulting in loss of independence, initiative and wellbeing with 61% reported feeling depressed recently.

Over a third of people with dementia live in residential care and psychological interventions help people live as well as possible with the condition.

There is an increasingly ageing population, with fewer people under the age of 65 to act as carers. Technology uses in dementia not new, have been being explored for past 20 years covering areas such as safer walking and memory, rehabilitation and reminiscence/ art therapy are examples of therapeutic modalities. Applications are missing in applications of technology for enjoyable things to do.

Touch screens are non-stigmatic as young people use them too, it’s contemporary and popular, no prior knowledge is needed as touch screens are intuitive and holistic as they address usability issues.

Rationale for project:-

* Almost 2/3 of people who live with dementia also live with depression, one reason that has been given for this is that dementia lessens a person’s ability to organise enjoyable activities.
* Something enjoyable to do in the day has bene identified as a unmet need
* Most technology focuses on safety and security for carers, which is important, but isn’t all there is.
* Research focus is on deficit and loss associated with the condition and ignores what is retained and what is enjoyable.

Two projects being explored.

Project 1 – CIRCA (Computer Interactive Reminiscence and Conversation Aid):

This has been evaluated in residential care recently. It is a tool to aid social interaction and supports joint reminiscence. Family come to visit relatives and find they have little to talk about. CRCA provides something enjoyable to do together. It has generic material appropriate for a range of preferences and tastes. The material is not personalised which can be good or bad, but has been found that some personal material can cause some distress in people.

It has been designed by people with dementia.

It has been evaluated in residential care over the last few years, but more recently taken CIRCA out into the community with people with dementia and carers

Project 2 –LIM (Living In the Moment):

Is a series of bespoke computer games, focussing on independent interactions. They were designed by people with dementia. These applications provide something enjoyable to do in care home. The activity is initially guided, but the resident can then be left to use independently. It supports actively engaging and includes games and art applications which are being used particularly well on windows tablet, but not on the iPad yet, but on tablets. This has also gone out into the community.

Touchscreen technology can benefit people with dementia and appropriate in various setting, with varying levels of cognitive impairment, interactions can be independent or supported people with technology able in their technology interaction with appropriate level of support. Stakeholders need to explore more creative ways to promote and enable participation.

Project in collaboration with Sheff care and 220 people will be recruited Project supports communication, social interaction and leisure activities.

Q&A

*[Could not capture question on recording]*

The games will last for 5-10 minutes as it’s quite repetitive, the art one is much more engaging in that sense, but would probably be more engaging if it was used in a small group that was supported by someone else. If everyone could take turns, then it might be a more of an interactive, longer session.

**Critical care in care homes, Rachel Binks**

Rachel Binks is nurse consultant in acute and digital care. Airedale outlined the different types of technology being used, which are; telecare alarms, telecoaching e.g. long-term care and monitoring, telemonitoring – collect data elsewhere, analyse remotely and teleconsultation. Rachel outlined different types of terminology as previous audiences were unsure what the different terminology referred to. At Airedale they provide teleconsultation.

The main problem teleconsultation/ video consultation aims to address is people waiting in outpatients for a long time and ambulances queuing up outside A&E outpatient clinics are empty out of hours and very busy within hours, system wastes the time of patients when sometimes they don’t need a physical exam, they just need to talk about their health problem (s). We currently have a system designed by default.

Airedale are in their 9th year of telemedicine journey. Airedale started in prisons due to their being many issues with taking people out of prisons .e.g. escort costs, prisoners being stared at, logistics and travelling costs. Teleconsulting can be used during the night and remotely for emergency care. Unless they need to touch the patient they don’t need to come out, they can get x-rays and scans etc… done in prisons now and these can be uploaded onto electronic patient records using System One, GPs and prisons use it. Can also give advice on someone needs to go to hospital if someone falls. This helps stop prisoners who would otherwise not need to leave the prison from leaving.

Airedale believed this model was similar to care homes as residents may not want to be moved. In 2011 they opened 24/7 clinical hub, however challenges getting consultants to lead it so it’s ran by band 7 clinical outreach team go round the wards picking up people who are beginning to deteriorate using tools such as the National Early Warning Score to decide in they need to go to intensive care or high dependency, that model very similar to what they were going to offer to care homes as they are remotely assessing the need for the patient to come into hospital. It is hoped that this will improve patient experience (don’t always want to come out of home), change patient flow; reduce cost of bringing people to hospital. Lose money by not admitting people, but CEO says it’s the right thing to do regardless as there’s no point in admitting people that don’t need to be admitted.

So far it is used in nearly 300 care homes across country and support nearly 10,000 residents.

Aims of the service

* Provide safe, effective high standards of care
* Support residents to stay at home
* Support residents, nurses and carers in the planning of care
* Escalate to community teams out of hours

They use governance framework to make sure the level of care doesn’t suffer due to being dealt with remotely. If someone has a complaint or an issue it goes through regular complaints procedure.

What they often do is escalate to community teams so as to enhance primary care not to replace it.

Airedales activity is increasing, with no charge for advice and support; however, there is a charge for clinical calls and the services are 24/7. Rachel stated that the video is useful for seeing ulcer wounds.

However, homes wanting to be fitted with the system need to have a phone and broadband to work.

As it’s new, there’s not a lot of evidence there so they are trying to build on the evidence as they go to get commissioners on board. Research they have done has been over 6 or 12 months where they have employed staff temporarily, but difficult to assess over that period of time as system could take 3 months to set up. After two years they said they needed an independent evaluation so they looked that the YHEC (York Health Economics Consortium) who have conducted an evaluation.

Found a reduction in A&E admissions by 37% in homes that had telemedicine, but also found a reduction in those that didn’t of 32%. So other interventions in the community are also working, but with telemedicine it’s increased by another 5%.

However A&E visits reduced by 45% in care homes with telemedicine and by 31% in those that don’t. Reason for this is sometimes it’s easier to admit then get someone assessed and out in a given time frame. So increase in 14%.

When looking at call outcomes, up to 90% of people stayed in their place of residence and they take roughly 1500 calls a month now. With the other 10% being admitted to a hospice or hospital with other having the ambulance called out to assess or are referred to A&E.

For those that stay in the place of residence half are referred to; ACCT, Community Matron, District Nurse, Palliative Care CNS, Palliative Care Consultant, Referral to social services, Chemotherapy Help Line, OOH GP or homes visit GP. However, they would like to be able to offer out of hours electronic prescribing to prevent getting out of hours GPs to doing this.

One problems is out of hours GP or locum may admit someone despite them saying they don’t need admitting and without the GP even going to see them which then pushes up A&E attendance rates. They record they don’t think they need to be admitted on System One and then it sometimes encourages GPs to go to the home and have a look instead. Also, reduces the amount of calls that the GPs are getting.

They also have a gold line service for end of life. It enables vulnerable patients to stay at home, improve their experience and helps coordinates care, reduces hospital bed stayed and increases number of people dying in their usual place.

Here a sticker on phone that links directly to the hub. They use the gold standards framework. In the final weeks of life, patients are given an iPad/ tablet for video calls to the hub, the aim being to keep patients at home at end of life. Have specialists in palliative care. They then coordinate care they need.

There are roughly 6-7000 calls per month for gold line, which is often used by families to report death and it is estimated that 58% of people achieved their preferred place of death with only 14% dying in the hospital. They are the hospital that has the lowest number of patients who die in hospital.

As part of the service there is also an Intermediate care hub which joins up with health care and social care. They also do training remotely as well as having a range of health care professionals.

They’ve also started a GP triage which is in development. This is due to GPs finding that 320b of calls don’t necessarily need a GP visit.

They also have integrated health records.

They believe success is down to people working in a different way and having the shared record so that everyone can see what’s happening with one patient. They spoke about the desire to use other therapists in the future as well, to help people become more active with physios. This is something they are currently starting to trial.

Q&A:

*[Questions weren’t legible]*

<https://uecho.shef.ac.uk:8443/ess/echo/presentation/821586ac-d337-4c2a-9c8e-cebc5bdc400d>

Table 67 Post-its collected from notice boards for debate

|  |  |
| --- | --- |
| **Pros** | **Cons** |
| * May be useful for remote training and more naturalistic observations * Giving people more say and control over their cure and giving them more independence * Fits in well with new MCA/ DoLs supportive care model proposals (Draft bill consultation) * Symptom discussion assessment via video conferencing to residents bedroom * Post falls assessment, alleviate need for ECP visit. Health professionals can monitor the situation remotely and give advice to staff * Staff to feel supported can learn from difficult scenarios and increase their confidence and that of family * Continuity of care * Cut down on visiting time and cost * Convenient * Enables care closer to home which is what people and their relatives want | * Losing face to face contact intimacy * Will it create a 2 or 3 tiered care service? * Difficulties in training and checking competency * Disenfranchises staff and their personal skills – less personal contact for patients * Knowledge ability of staff * Cost * Connectivity * Visual accuracy * Confusion for home residents – issues with understanding and consent * Staff reluctant to take responsibility * People with communication/ cognition difficulties may find they can’t access this technology easily and become more isolated when not interacted with – increasing depression etc.… * Data security/ consent * Would recordings be saved then streamed * Consent of family/ understanding of that from patient * Need to build trusting relationship alongside technologies * How to stop residents interfering with technology * Is CIRCA available? * Tech phobic * System break downs! Providing safe continuous care if the system fails – Back up networks * Training needs – could be hard to deliver on a large scale #care home staff would need training for IT alongside other necessary training * Electric records only as good as person operating IT * Costs and logistics of training * Cost & turnover of staff in care homes * Care home staff would need training for IT alongside other necessary training * Training needs – could be hard to deliver on a large scale. |

When discussing the debate, there appeared to be more cons to technology than pros.

**The debate:**

**Cons**

Cons that were mentioned included that technology is being used to do something humans could do better, and that there are a lot of logistics around training. Someone also questioned who would deal with any technical issues and commented on high staff turnover and the logistical issues this presented for training.

Others raised concerns over data security, claimed the system wouldn’t be as easy to use when there’s lots of free text and that the local authority aren’t fully technologized. Also, that security can inhibit progress and use especially with providers working outside N3 firewall.

Technology needs to incorporate many different organisations and many end users may have problems with technology , have issues with internet connection, security and staff and with carers or relatives using tablet for other purposes other than to meet needs of resident.

Other logistical issues that were mentioned included that getting the technology commissioned is difficult and that there is a need for stronger powered studies into the use of technology.

**Pros:**

One delegate suggested that using technology (referring to Airedale system) is no harder than online shopping and that certain companies such as Amazon spend a fortune on usability. It was believed that a system in healthcare was needed, that had the same kind of infrastructure.

Also, that mobile phones come with instructions and that everything is now intuitive and that the time saving benefits of tech will encourage people to use it.

Someone mentioned that some groups are now using skype for business and contrasted the data security issues with the security of paper documentation.

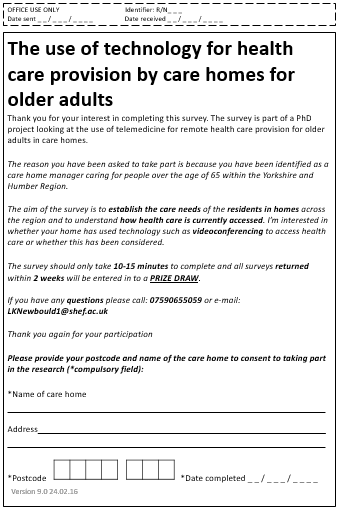
Pros of using technology for records included the standardisation of coding, and how the use of the NHS number would allow a link to already existing digital records.

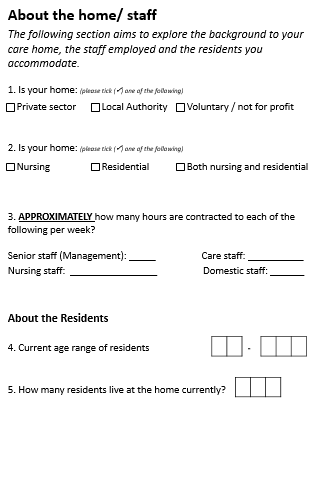
It was suggested that technology in now adaptable too, so for people with communication difficulties it can be adapted to how people can communicate on particular days. Emphasising that technology is important in promoting care, in addition to excluding unwanted visits to hospital.

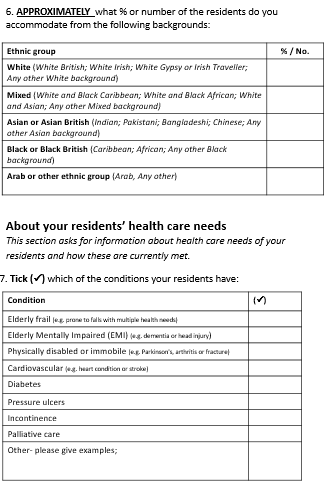
Final comments were that for people with cdifficile etc.. They need to be kept out of hospital and Airedale’s experience is showing that technology helps and it is believed that technology is now being embraced.

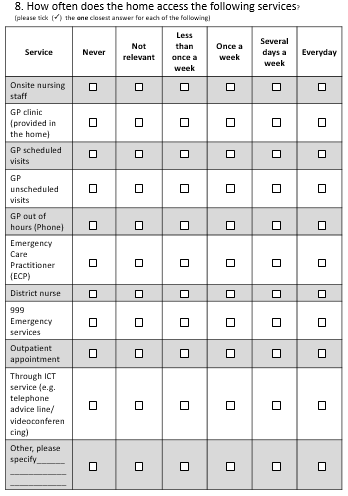
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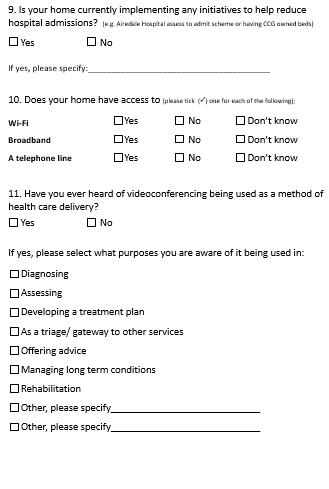
* 1. Appendix 4 - Survey



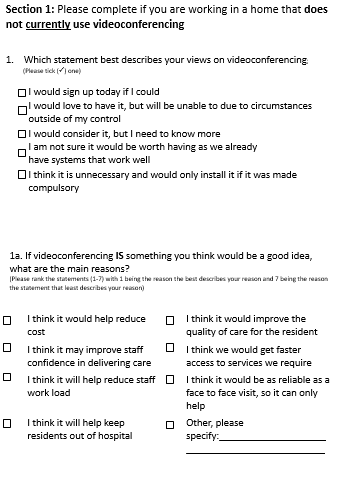


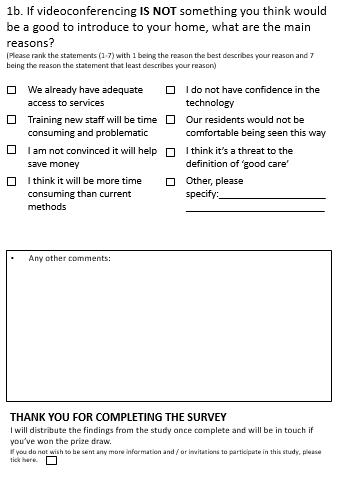


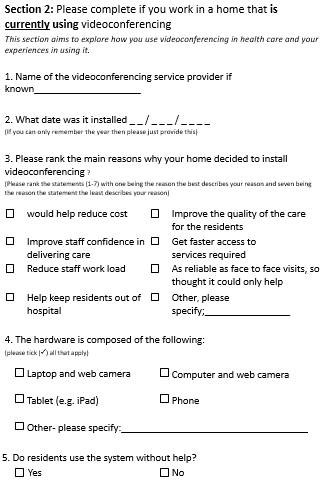


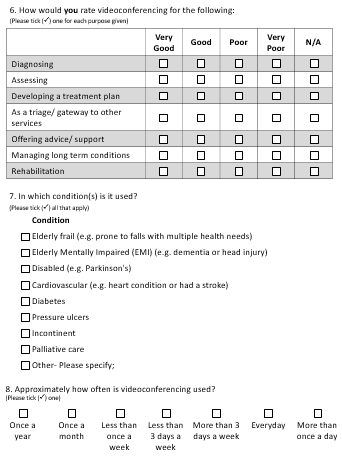


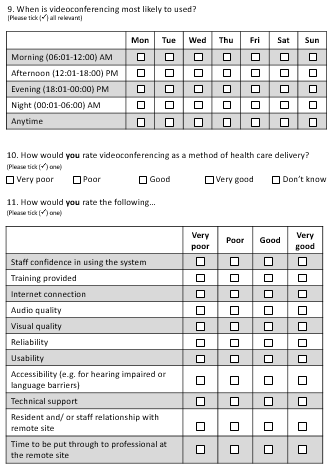


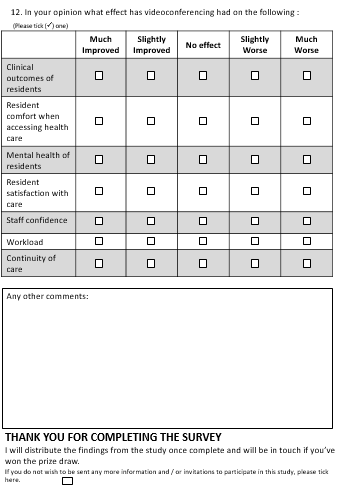












* 1. Appendix 5 – AAATE paper

Remote health care provision in care homes

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**Quick Overview:** A survey was developed to map provision, knowledge, attitudes and views towards videoconferencing in care homes in Yorkshire and The Humber. The survey was sent to 859 care homes, with a 14% response rate. Twelve homes reported using videoconferencing.Non-users appeared sceptical, managers using the system reported improvements in outcomes.

**Keywords.** Care home, nursing home, videoconferencing, remote healthcare

**Introduction/Background**

It is estimated that 400,000 residents are now living in care homes in the UK (Martin et al., 2011). Many of whom will have made the decision to move based on the nature of their needs, with many enduring a disability that can no longer be supported in their own home (Martin et al., 2011, Goodman, 2015). Due to the increasingly ageing population, it is likely that the need for care homes will increase across England (Smith, 2015). This will necessitate the development and assessment of innovative methods for delivering efficient health care in care homes (NHS England, 2014a).

Videoconferencing has been trialled in care homes in a wide range of countries with the aim of improving resident access to health care for a wide range of conditions and purposes, such as; assessment, management and diagnosis. Papers identified previously, also looked at a range of clinical outcomes such as; hospital admissions, A&E attendances and medication use, with the main body of research predominantly originating from America. However, there is little evidence available for the use of videoconferencing in Yorkshire and the Humber, England (Newbould et al., 2017).

**Purpose**

The survey aimed to explore the use of videoconferencing to access health care in care homes, identifying levels of knowledge, attitudes and views towards videoconferencing in the region. The survey was conducted as part of a wider realist evaluation of videoconferencing in care homes in Yorkshire and The Humber. The survey was conducted in early 2015, with the findings being used to inform the wider PhD as well as clinical group commissioners and health care professionals of the current state of provision.

**Method**

A survey was developed following five key stages defined by Steven (2012) (Stevens, 2012). The first was identifying interviewees, here purposeful sampling was used to recruit four care home managers to guide the development of the survey. Two of the care home managers were from nursing homes (1 home that used videoconferencing and 1 that did not) and two managers from residential homes (1 home that used videoconferencing and 1 that did not). The second step was to decide on the method and design of data collection, here semi-structured interviews were used. This allowed for the exploration of participants’ views and experiences and structure for cross-case comparability (Bryman, 2012). The interview guide developed, considered the information needed in order to map current provision, attitudes and knowledge of videoconferencing in the region. The findings were analysed thematically and the developed tool was then piloted amongst the original participants and colleagues. From this the survey was amended to make it more concise and questions were re-worded where they were deemed to be unclear (Stevens, 2012). This was then sent out to 859 care homes registered with the UK Care Quality Commission (CQC) as caring for people solely over the age of 65, with the intention that the manager would complete it. An online version was also developed and the link provided in a covering letter. Ethical approval for this study was obtained from a higher education institute.

**Results**

Of the 859 surveys that were sent out, 124 (14%) responses were received. One difficulty in undertaking this research was engaging this sector in the research, this could be due to time and resource constraints (Royal College of Nursing, 2012).

By the type of care home, 76 responses came from residential homes, 29 from both nursing and residential and 16 came from nursing homes. In terms of ownership 94 were private, 17 not for profit/ voluntary, nine were local authority and four did not disclose their ownership. Around 2/3 (62%) of respondents had heard of videoconferencing as a method of health care delivery. The most common purpose was for receiving advice with 46% of respondents stating they had heard of videoconferencing being used for this. This was followed by assessing (42%) and as a triage/ gateway to other services (34%). Twelve respondents reported using videoconferencing in the care home. Table 1 shows which statement best described the views of respondents not using videoconferencing.

**Table 68** Shows which statement best described how respondents, felt about implementing videoconferencing

|  |  |
| --- | --- |
| **Statement** | **Number of respondents** |
| I would sign up for it today if I could | 14 (11.29%) |
| I would love to have it, but will be unable to due to circumstances outside of my control | 10 (8.06%) |
| I would consider it, but I need to know more | 48 (38.71%) |
| I am not sure it would be worth having as we already have systems that work well | 20 (16.13%) |
| I think it is unnecessary and would only install it if it was made compulsory | 14 (11.29%) |
| Other/ missing | 6 (4.84%) |

This question showed that 39% of respondents reported that they would consider it, but would need to know more. This was followed by 16 % saying they were not sure it would be worthwhile, as they already havesystems that work well,another 11% said they think it would be unnecessary and 11% said they would sign up for it today if they could.

Respondents noted some possible benefits to videoconferencing could include: Care closer to home; that telemedicine could provide the best route to the ward/ department as it avoids going through A&E and another respondent stated that they believed it would speed up access to health care.

However, many were more cautious, with one respondent stating that they thought residents would be distrusting. Others mentioned it being a threat to the definition of ‘good care’, that you cannot physically examine the resident, that people with dementia may have problems verbalising symptoms over a video link, that new technology is time consuming and would take staff away from hands on care they provide and that there are better ways to save money.

Of the respondents that reported using videoconferencing 77% were based in urban areas and 22% in rural.

Respondents currently using videoconferencing rated this method, overall, as being either good (42%) or very good (50%), with 1 (8%) missing response. No respondents selected: very poor, poor or don’t know.

When asked how often their homes use videoconferencing, 67% said less than once a week, 17% said less than three days a week and finally 8% said once a year.

Figure 1 displays how different outcomes were rated by respondents using videoconferencing. Staff confidence appears to have improved the most with videoconferencing, as six respondents rated confidence as much improved and five as slightly improved. Resident satisfaction, mental health of residents and workload were rated the lowest with only four homes rating videoconferencing as having slightly improved or much improved for these outcomes.

**Figure 1** How respondents rated videoconferencing in terms of impact on outcomes

**Discussion**

The aim of the survey was to explore the use of videoconferencing as a means of access to health care in care homes, including a focus on knowledge, attitudes and views towards videoconferencing in Yorkshire and the Humber, England

Of the 124 respondents, only twelve reported the use of videoconferencing, suggesting it is still an uncommon method of health care delivery. However, roughly 62% of the respondents had heard of videoconferencing as a method of health care delivery, suggesting that there is an increasing awareness of videoconferencing being used as a method of health care delivery.

The majority of respondents when asked about their view towards videoconferencing stated they would either need to know more about it, that they thought it was unnecessary as they already had systems that work or that they thought it was unnecessary and would only install it if they had to. This suggests that prior to installing videoconferencing care home workers are quite sceptical about its potential use and how it may fit into everyday care pathways. This was also reflected in the additional free texts boxes where respondents stated specific concerns or perceived benefits to the system.

Of the respondents that reported using videoconferencing 77% were based in urban geographical codes and 22% were in rural. This is an interesting given that theory suggests videoconferencing would be of most benefit to those geographically isolated and suggests that the uptake of videoconferencing may be influenced by more than geographical factors.

Post installation all respondents rated the system overall as being very good or good, with 67% of respondents stating that they used it less than once a week, with the greatest impact being seen with staff confidence.

This survey was used to help identify sites for further study and in itself it is limited in being able to draw firm conclusions as the response rate was low and therefore results may have some representation bias. For the next part of the study three care homes will be researched in more detail to identify factors that influence the uptake and sustainability of videoconferencing for health care provision in care homes.

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* 1. Appendix 6 – Strategic Manager 1 – Notes

**Strategic manager – Care home 1**

**What are your strategic objectives for \*\*\*\*\*?**

Digital health –main priorities

Keep down health cost – balance staffing – visits – GPs have time? Or expertise?

**How should I focus my findings in a way that’s useful?**

People will be more digital literate. New age of people want services around their needs (health economics and customer experience). Commissioners, residents and staff.

**What kind of documents would be available for analysis around service use?**

Unplanned visits, vol of GP calls, Levels of morbidity – analysis – how are morbidities met? Map out each home, how archaic the response is?

**How do \*\*\*\*\*go about acquiring and implementing new technologies?**

If people know problems to solve – they are learning

Go into new partnerships with companies when identified

Checklist of prerequisites

Return on our investments?

Digital companies sell to care homes

Relevance to method of digital care

Self-funding subsidies, those funded by state

Costs kept down

Technological advances elsewhere

* 1. Appendix 7 – Strategic Manager – care home 2 - Notes

**Strategic Manager – Care home 2 - Notes**

**What are the strategic objectives for \*\*\*\*\*\*\*?**

Customer first

Use of social media for feedback

Wi-fi to 100 care homes and housing

Open more doors for customers &staff = selling point

**How should I focus findings to be useful for the sector?**

Save travel time (staff) -> saving cost

Jaba and Webx to increase productivity

What kind of documents available for analysis?

**How do \*\*\*\*\*\*\* go about acquiring/ implementing new technology?**

E-mail info I would like and he will help me collect it

**How do \*\*\*\*\*\*\*\* go about acquiring and implementing new technology?**

5 year business plan – tech key element – Wi-Fi key to it.

* 1. Appendix 9 – CFIR Constructs

Table taken from: <http://www.cfirguide.org/constructs.html> (17.12.2017)

|  |  |  |
| --- | --- | --- |
| **Construct** | | **Short Description** |
| **I. INTERVENTION CHARACTERISTICS** | |  |
| A | Intervention Source | Perception of key stakeholders about whether the intervention is externally or internally developed. |
| B | Evidence Strength & Quality | Stakeholders’ perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes. |
| C | Relative Advantage | Stakeholders’ perception of the advantage of implementing the intervention versus an alternative solution. |
| D | Adaptability | The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs. |
| E | Trialability | The ability to test the intervention on a small scale in the organization, and to be able to reverse course (undo implementation) if warranted. |
| F | Complexity | Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement. |
| G | Design Quality & Packaging | Perceived excellence in how the intervention is bundled, presented, and assembled. |
| H | Cost | Costs of the intervention and costs associated with implementing the intervention including investment, supply, and opportunity costs. |
| **II. OUTER SETTING** | |  |
| A | Patient Needs & Resources | The extent to which patient needs, as well as barriers and facilitators to meet those needs, are accurately known and prioritized by the organization. |
| B | Cosmopolitanism | The degree to which an organization is networked with other external organizations. |
| C | Peer Pressure | Mimetic or competitive pressure to implement an intervention; typically because most or other key peer or competing organizations have already implemented or are in a bid for a competitive edge. |
| D | External Policy & Incentives | A broad construct that includes external strategies to spread interventions, including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting. |
| **III. INNER SETTING** | |  |
| A | Structural Characteristics | The social architecture, age, maturity, and size of an organization. |
| B | Networks & Communications | The nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization. |
| C | Culture | Norms, values, and basic assumptions of a given organization. |
| D | Implementation Climate | The absorptive capacity for change, shared receptivity of involved individuals to an intervention, and the extent to which use of that intervention will be rewarded, supported, and expected within their organization. |
| 1 | Tension for Change | The degree to which stakeholders perceive the current situation as intolerable or needing change. |
| 2 | Compatibility | The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals’ own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems. |
| 3 | Relative Priority | Individuals’ shared perception of the importance of the implementation within the organization. |
| 4 | Organizational Incentives & Rewards | Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary, and less tangible incentives such as increased stature or respect. |
| 5 | Goals and Feedback | The degree to which goals are clearly communicated, acted upon, and fed back to staff, and alignment of that feedback with goals. |
| 6 | Learning Climate | A climate in which: a) leaders express their own fallibility and need for team members’ assistance and input; b) team members feel that they are essential, valued, and knowledgeable partners in the change process; c) individuals feel psychologically safe to try new methods; and d) there is sufficient time and space for reflective thinking and evaluation. |
| E | Readiness for Implementation | Tangible and immediate indicators of organizational commitment to its decision to implement an intervention. |
| 1 | Leadership Engagement | Commitment, involvement, and accountability of leaders and managers with the implementation. |
| 2 | Available Resources | The level of resources dedicated for implementation and on-going operations, including money, training, education, physical space, and time. |
| 3 | Access to Knowledge & Information | Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks. |
| **IV. CHARACTERISTICS OF INDIVIDUALS** | |  |
| A | Knowledge & Beliefs about the Intervention | Individuals’ attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention. |
| B | Self-efficacy | Individual belief in their own capabilities to execute courses of action to achieve implementation goals. |
| C | Individual Stage of Change | Characterization of the phase an individual is in, as he or she progresses toward skilled, enthusiastic, and sustained use of the intervention. |
| D | Individual Identification with Organization | A broad construct related to how individuals perceive the organization, and their relationship and degree of commitment with that organization. |
| E | Other Personal Attributes | A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style. |
| **V. PROCESS** | |  |
| A | Planning | The degree to which a scheme or method of behavior and tasks for implementing an intervention are developed in advance, and the quality of those schemes or methods. |
| B | Engaging | Attracting and involving appropriate individuals in the implementation and use of the intervention through a combined strategy of social marketing, education, role modeling, training, and other similar activities. |
| 1 | Opinion Leaders | Individuals in an organization who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention. |
| 2 | Formally Appointed Internal Implementation Leaders | Individuals from within the organization who have been formally appointed with responsibility for implementing an intervention as coordinator, project manager, team leader, or other similar role. |
| 3 | Champions | “Individuals who dedicate themselves to supporting, marketing, and ‘driving through’ an [implementation]” [101] (p. 182), overcoming indifference or resistance that the intervention may provoke in an organization. |
| 4 | External Change Agents | Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction. |
| C | Executing | Carrying out or accomplishing the implementation according to plan. |
| D | Reflecting & Evaluating | Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience. |

* 1. Appendix 9 – Report for Clinical Commissioning Groups (CCG)s and Strategic Managers

**Report for Clinical Commissioning Groups and Managers in the Care Sector**

**Findings from PhD research: The use of telemedicine for remote health care provision in care home settings**

**Executive Summary**

**Background:** Research has shown that older adults who reside in care homes can experience challenges in accessing the healthcare that they need. A rapidly developing and increasingly popular method of delivering health care is videoconferencing, which has shown some promise in addressing some of these challenges. The main service provider in Yorkshire and the Humber region is a hub provided through Airedale NHS Trust (URL: <http://www.airedale-trust.nhs.uk/services/telemedicine/>), but some care settings may choose to organise their own videoconferencing system.

**Aim:** This document sets out a series of recommendations to helpcommissioners, strategic managers and care home managers assess the readiness of any given care home setting to use videoconferencing, before its introduction.

**Method:** The study that underpins these recommendations has involved a literature

review (URL: <https://www.hindawi.com/journals/ijta/2017/5785613/>), a regional survey of care homes and a comparative case study of three homes.

From the results of the survey, three homes were identified and looked at in detail; one care home where videoconferencing was integrated into regular care and the use of it had been sustained for three years; one where they were trialling videoconferencing and were struggling to optimise the use of it; and a third where videoconferencing was not in use and the home had no future plans to implement it.

Data was analysed to identify the factors that enable use of videoconferencing in such settings. The findings were then used to create a series of recommendations for commissioning and for practice. These recommendations are not definitive, but have been identified by this research as the most pertinent in the successful uptake and sustainability of videoconferencing.

**Findings from existing evidence:** The results of the literature review found that research on the use of videoconferencing has been sparse globally, with most of the research originating from geographically vast countries such as the USA and had most frequently been researched as a method of conducting assessments. For the full review, please see here: <https://www.hindawi.com/journals/ijta/2017/5785613/>

**Survey results:** Survey results found that most of the homes that responded were residential and privately funded. Prior to implementing videoconferencing, findings suggest that care homes are not convinced that technology will enhance their practice. However, those that were using it reported being happy with the service provided. One of the main drivers to successful uptake appeared to be access to services (e.g. GP out of hours) and the perceived advantage of implementing videoconferencing in light of this. Detailed results available upon request.

**In-depth case studies:** Analysis of data from the three homes where in-depth research was conducted identified12 issues from which recommendations were derived.

**Recommendations for practice and for commissioning are as follows;**

**Characteristics of the care home**

*Culture*

1. The manager needs to be committed to the successful implementation of the service and have a willingness to embrace new ways of working. Managers need to have a high level of autonomy within the care home, as this will reduce barriers to implementation. Videoconferencing may be best suited to homes that are dissatisfied with other remote services such as ‘out of hours GPs’.
2. Videoconferencing is not a substitute for knowledge of how to manage resident health. Senior staff need to support care assistants in using the system until they have developed this knowledge.

*Staffing*

1. Videoconferencing services appear to be suited to homes where the home is only staffed by qualified carers or where nurses work alone. A package such as the Airedale hub, provided a broad range of services that may aid less qualified care home staff and professionally isolated nurses in managing resident care.
2. Care home managers need to be committed to the ‘buy-in’ so they can advocate for the use of the service (the technology and support provided from remote staff) and facilitate implementation. Homes should have the time and space to undertake the training required to feel confident in using the service. Staff need to support each other in having time and space to learn as well as encouraging and learning from each other.
3. Extent of ‘buy-in’ to videoconferencing needs to be regularly reviewed and assessed in relation to staff turnover and the training required by new members. Leaders (managers, deputy managers, senior carers and nursing staff) in the home need to be effective in providing hands on training for the use of videoconferencing and encouraging shared learning amongst all care home staff.

**Characteristics of staff**

1. Training should be provided to ensure staff are confident in using technology. Where they do not feel confident, they have to feel able to access helplines provided by the service. All staff should encourage each other in undertaking training to use the technology until everyone is confident in using the equipment. Staff need to feel confident in using technology to feel more able to overcome any challenges.

**Features of videoconferencing**

*Willingness to embrace new ways of working*

1. There needs to be care home staff ‘buy-in’ at all levels. This can be achieved by promoting the potential benefits of using videoconferencing. One example is, where staff are not confident in conveying a situation over the phone they can show staff at the remote service site the situation. This can also be valuable to those whose first language is not English.

*Opportunity to trial the service*

1. Gaining staff ‘buy-in’ can be achieved by allowing staff to see the technology being demonstrated and enabling them to test it out in a safe environment.

*Ease of use*

1. The technology and associated service requires good Wi-Fi access for success. If this is not readily available, care home staff will become rapidly discouraged from using it. Ease of use is promoted by the technology being portable or can be situated in a room which can be used for the purpose.

**Relationships with the remote site (in this case, the Airedale hub)**

*Relationship with the remote service provider*

1. Care home staff need to know about, and have confidence in, contacting and communicating with the remote service provider. This can be achieved by allowing care home staff to regularly communicate with the provider, to build a trusting relationship.
2. Promoting videoconferencing services effectively is required to enable staff to make an informed decision about use.

**The way videoconferencing is implemented**

1. From the outset, the home needs informal and formal champions of videoconferencing to help encourage the use of videoconferencing and the willingness of staff to try new ways of working.

**Conclusion:** In conclusion, there are a broad range of factors that affect the uptake of videoconferencing in the care home. Several recommendations can be identified to facilitate successful use.

**Aim:**

This report summarises a three-year study and identifies recommendations for implementation of videoconferencing for commissioners and providers.

**Background:**

This research, conducted between (01/01/2015 – 01/01/2018) has explored factors that affect the uptake and sustainability of videoconferencing as a method of enabling care home residents to access healthcare. Videoconferencing is where two remote sites are connected via an audio visual link. The main service provider in Yorkshire and the Humber region is a hub provided through Airedale NHS Trust (URL: <http://www.airedale-trust.nhs.uk/services/telemedicine/>). Care homes linked to the hub can seek advice from nurses by accessing the software on a laptop provided by the hub. Other similar services include Locala, which aims to deliver more integrated community services through using mobile networking. The Locala services enables appointments to be made with the resident’s clinician through videoconferencing in Kirklees, Huddersfield and West Yorkshire. The Airedale service is available all day every day either for advice or to act as a triage service, arranging additional care such as nurse visits or ambulances. Nurses at the Airedale hub can also seek advice from the doctors at the hospital, which is then passed onto the care home. For homes that have technical difficulty accessing the hub, a support line is available via telephone.

**Method:**

The study was composed of three parts. The first part was a scoping review on the use of videoconferencing for older adults in care homes globally (URL: <https://www.hindawi.com/journals/ijta/2017/5785613/>). This informed the development of a survey across Yorkshire and the Humber. The survey was designed to map knowledge, attitudes and current provision of videoconferencing in 859 care homes registered as caring for people solely over the age of 65 in Yorkshire and the Humber. There was a 14% response rate (124 homes). The results showed that most homes wanted more information about the use of videoconferencing, with some also stating they did not see the point as they already had systems that worked well. However, post implementation all homes rated videoconferencing as being very good or good, with the greatest impact being on staff confidence. This suggests that homes are initially sceptical about implementation of videoconferencing, but most saw benefit in the use of the service post-implementation. Of the homes that were using videoconferencing over 70% were in urban areas. It also suggests that there are more factors to be considered other than being geographically distant from other services. The main drivers appeared to be access to current services and perceived advantage of implementing the system. Once implemented, sustainability then appeared to be most affected by care home culture and experiences of hub support.

**Characteristics of the care home**

*Culture*

It was suggested that where employees have greater commitment to the care home they were more likely to go above and beyond for the organisation, helping the homes achieve its goals and working more effectively with other members of the team. In order for the service to be well implemented, there needs to be a sense of team work; colleagues need to support each other in learning how to use the system and in overcoming challenges at all levels. The study suggests that videoconferencing would be best applied to homes where staff are intrinsically motivated to help the home achieve its goals. Where they have a strong commitment to the home, they are more likely to advocate for videoconferencing. This is particularly relevant where staff observe the benefits of using the service, and this will increase use and sustainability.

One factor this study suggests may help improve commitment to the care home and reduce staff turnover, is by ensuring that staff at all levels feel valued and all feel able to affect change within the home.

*Shared learning*

This research found that strong social links in the home promoted a culture of shared learning, for example where managers admitted fallibility to care assistants and there was time and space for training. This also motivated staff intrinsically to meet the care home needs and encouraged organisational commitment. Members of staff had a greater sense of psychological safety (being able to contribute, without fear of negative consequences to self-image) so they felt that they could build up their experience in using videoconferencing and in turn this encouraged the greater use and sustainability of videoconferencing.

Additionally, homes with strong social links, where staff covered each other’s jobs and teams worked effectively to meet the needs of the home, seemed better at implementing videoconferencing. Here, they would be more likely to support each other in undertaking training and providing time for them to learn to use the system.

*The need for change*

The need for change was also seen as a pertinent factor. Where staff were unhappy with other services provided, they would be more likely to welcome change. In addition, if there were strong communication links within the home, the dissatisfaction with the current status quo would build and so barriers to implementation were reduced and the care homes commitment to implementing videoconferencing increased. This helped to sustain the use of videoconferencing.

*Staffing*

Having a very low staff turnover in the care homes, and limited use of agency staff, was seen as being essential to the culture of shared learning necessary to implement videoconferencing.

Additionally, where homes were small (approximately 30 residents) and had a high ratio of managerial or senior staff to care assistants employed at the home, this was seen to be beneficial. The ideal employment ratio was found to be 1:4 (1 senior carer to 4 care assistants). Here, information was disseminated more easily throughout the home and the availability of senior staff to provide support at the home was greater. This allowed for information/opinions to spread about the intervention more readily, aiding the build-up of satisfaction with the service. In addition, the greater availability of senior care assistants and managers allowed care assistants to undertake more informal learning and shadowing, thus again encouraging shared learning and increasing use.

The level of nurse training amongst staff may also influence the use of the service. In homes which employed trained nurses, they appeared more likely to use the videoconferencing system for more acute situations, which demanded a speedier response. However, where staff were not qualified or where nurses worked alone, they benefited from being able to seek the service provider’s advice on patient care for a broader range of health care problems. Thus increasing the use and sustainability of the service.

*Managerial influence*

Greater autonomy meant the care home manager had the flexibility to adapt to the needs of the home and was highly committed to the outcomes of the care home. As a result, managers with greater autonomy advocated for videoconferencing. In light of this, videoconferencing would be best implemented into homes where the manager has a high degree of autonomy in the running of the home. For example, if the manager was also the owner of the home.

Additionally, where managers encourage high level of verbal communication between staff, this was seen to help develop trusting relationships at all levels. Here, the manager was also readily available to address concerns from staff in the home and provided training when required. This seemed to encourage shared learning and increased staff commitment to the care home, which was again seen to increase the use and sustainability of the service. In this setting, where leaders are enthusiastic about the use of videoconferencing, this also seemed more likely to spread throughout the team, making it more likely that staff will increase their commitment to implementing the intervention.

It was also noted that where the home was over/adequately staffed, managers also had more time to recruit staff candidates. This meant staff were selected based on their attributes as opposed to needing to meet the immediate needs of the home, and so staff employed were better equipped to meet the needs of the home in the long term. This meant psychological safety was increased as staff turnover was reduced. A high level of psychological safety in the home is necessary to encourage staff to trial and develop their experience in using the system.

**Characteristics of staff**

*Perceived capability (self-efficacy)*

Where staff perceived their ability to be high and had more confidence in what care pathways to access in different situations, it was suggested that they were more likely to feel confident in using the service and were more likely to use it. This could be encouraged with more training, and experience. If implementing videoconferencing with staff who perceive their ability to be low, daily support from the team will be required. This will help them develop their knowledge and self-efficacy in meeting resident’s needs and in using the service.

Findings suggest that some care home staff perceived their ability to use technology as being low and this also affected use, if they lacked confidence in themselves or the equipment. This was also linked to their motivation to persist with the videoconferencing. Where staff were more comfortable with using the system, they were more likely to advocate for this system and persist when faced with implementation challenges. However, confidence could be developed through time, training, encouragement from colleagues and experience. Staff need to be motivated to develop their self-efficacy in using the service and have the confidence to access available technical support if needed. Where homes lacked the time for training and time to learn and trial the system, staff were more likely to revert back to longstanding practices and routines of accessing health care.

**Features of videoconferencing**

*Being able to observe videoconferencing*

This was seen to work in two ways. The first was that staff had the opportunity to observe the service in use and assess the pros and cons for themselves. Where it was deemed to be more efficient or provide an improved service than alternative methods, staff were more likely to be positive about using it. The most pertinent issue in influencing staffs’ perceptions of videoconferencing appeared to be the response time of the hub. Where traditional services were seen to be slower and less reactive than videoconferencing, staff were likely to reaffirm their commitment to using it.

In addition, care home staff being able to show staff at the hub the situation through the monitor, when they lacked confidence in communicating with staff over the phone line, was seen in some circumstances to improve staff confidence. This appeared to be down to the fact they felt better able to communicate with remote nurses visually and thus had more confidence in the service providing more appropriate care for residents.

*Opportunity to trial the service*

Being able to trial the service also appeared to impact on use. It enabled care home staff to build their confidence in using the service and in communicating with staff at the hub. Each home had mentioned how useful it was to be able to do a dummy run to develop confidence in using the system. Where the system can be trialled amongst staff as many times as is required, staff were more likely to start using videoconferencing. Thus, this appeared to encourage the uptake and sustainability of the service.

*Ease of use*

Ease of use refers to how complex the technology is to use. Here, it was stated by care home staff and managers that the technology itself was not difficult to use, but some mentioned having had problems connecting to the internet hub. Therefore, it would be best to implement the system into homes that have better Wi-Fi connections.

*The technology design and quality*

The ease with which staff were able to move the equipment around the home also appeared to influence use, due to both issues with signal (previously mentioned) and the practicalities of the time taken to set up the laptop. Where staff are easily able to quickly set up the system and move it to a desired location, this is likely to improve uptake and sustainability.

**Relationships with the remote site and external resources**

*Relationship with the hub*

Another factor that may influence the use of videoconferencing is the relationship with the staff at the remote site. Although this was not conclusive, it may be something to take in to account when implementing the system; to ensure that the relationship is one that is likely to encourage continued use. In situations where staff do not feel equal partners in the exchange, it may endanger confidence in using the service and reduce use.

The research also found that staff feel they have greater psychological safety (that they could contribute without fear of criticism) through using the videoconferencing service as opposed to alternative services. Staff may be more likely to favour calling the videoconferencing service provider over other services. This makes it more likely that the service provider will be used more frequently and that staff confidence in accessing remote support for residents and resident wellbeing will improve, resulting in the system becoming embedded in everyday practice.

*External Resources*

In addition, where residents suffer from greater ill health it may be worth addressing the question of whether or not staff feel confident in using a technology based system, particularly when a speedier response from the service provider may be required. If a slow response from the service provider will endanger staff confidence, greater consideration might need to be taken regarding how to address low confidence, before implementing the system.

**Access to knowledge and information about intervention**

Finally, it was noted in one of the homes that they did not have access to readily available information about the use of videoconferencing in care homes. Therefore, the manager was unable to make an informed decision about whether or not to trial or implement the system, hindering uptake. Having the opportunity to observe the system in use may have been beneficial.

**The way videoconferencing is implemented**

Finally, the research demonstrated that it was important to have informal and formal opinion leaders in place to help drive the intervention. These can be managerial or otherwise.

Where there are staff passionate about seeing videoconferencing succeed, and they are likely to advocate its use, this will help drive uptake and sustainability.

**Conclusion**

There are a broad range of factors that affect the uptake of videoconferencing in the care home. However, the most pertinent factors appear to be concerned with care home culture, experiences, and having advocates for the system. Residential homes, where the manager has a high level of autonomy, appeared to be best suited to the use of videoconferencing. However, the nursing home in this study noted how valuable the system was to them in terms of reducing professional isolation. Therefore, this needs to be explored further.

**Project timescale:** 3 years, end date: 01.01.18

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9.9 Appendix 10 – Report for ‘Exploring Experiences of Participants in Care Home Research’

**The experiences of participants in care home research**

**FINAL REPORT**

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**Timescale:** 19.06.2017 - 15.09.2017

**Date completed:** 15.09.2017

**Supervisor:** Louise Newbould

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**Executive Summary**

**Background:** There are approximately 421,000 older adults aged 65+ living in care homes to date1. Many of these residents have complex needs, requiring varied degrees of specialised health care. Out of 14,900 rated care homes, 4% were rated as inadequate and 47% needed improvement, largely due to issues with understaffing, lack of skills, and inadequate management of medicines2. For the necessary improvements to take place, research is required to test new technologies, services, and methods of health care delivery. However, the vulnerability of this population3 and limited resources of care homes2 make this a challenging task. Care home research networks such as ENRICH (Enabling Research in Care Home) have been established to tackle this issue, and to help improve the lives and care of older people in the UK1. Identifying barriers to effective research is essential to improving the quality of care, and this information will help research networks to assist researchers to work with care homes and help tackle their biggest challenges. To do that, the valuable and under-researched experiences of participants in care home research must be explored, so that their unique perspective can inform research practice.

**Aim:** To summarise the findings for an eight-week project exploring the experiences of care home participants, putting forward possible benefits, challenges, and recommendations for future practice.

**Method:** A short systematic narrative review was undertaken to explore the current literature on the experiences of participants of care home research. This was followed by undertaking five qualitative interviews with participants who had previously taken part in case study research looking at the use of telemedicine for remote health care provision, interviewees included; manager, deputy manager, nurse, care assistance, family member. Key findings from the data were identified to help inform researchers and care home staff on what some of the challenges to undertaking research in this setting, with recommendations for future practice.

**Results:** The key themes that emerged from analysis of the qualitative interviews were perceptions of research, the research community engagement process, and advice that they would give to a researcher. Recommendations for future researchers from the participants’ perspectives have been made, and future research questions have been proposed.

**Recommendations:**

* Allowing staff time to participate in research may help reduce professional isolation, enable staff to inform future practice and enable staff members to develop their professional confidence. These findings may be useful when promoting research to care homes, and researchers may wish to consider including in their engagement strategy.
* Staff below management recognise the value and importance of taking part in research, both in practice and personal development. Whilst the manager may be the most qualified person to decide if a proposed project is of good fit, involving staff in this decision may provide a fresh perspective on how a project may be integrated into practice.
* Researchers may benefit from approaching care home associations as part of their recruitment process.
* Researchers should be aware of the limited resources available to care homes, and be mindful of restrictions on staff time during project design.
* Ensure that best times to contact are established early in the engagement process to ensure communication is effective.
* Include time in research design to developing a relationship with the care home as early as possible to establish connections, and familiarise with the residents, staff, and their schedule and culture.
* Reduce the amount of administrative effort of the care home where possible.
* A friendly and approachable communication style without appearing too formal will help residents feel more comfortable.
* Dementia awareness training should be undertaken before entering the care home
* Keeping care homes up to date about the progress of the research and showing how their contribution has helped.
* Managers who identify employees who struggle with confidence could consider them as good candidates for participation.
* Employees or volunteers with a keen interest for research should be considered for research championship roles.
* Research networks or care home associations should collect data on the reasons why care homes accept or decline research projects, and provide researchers with this information.
* Providing the decision maker with a logic model explaining the potential impact of their project on health care challenges that they consider a priority may be a way for researchers to increase the uptake of their projects.
* Consult with participants at all levels on how formal feedback can be formatted for wider uses to increase its value to them.
* Research networks should collect data on the prevalence of agency staff in care homes, and identify ways for them to be included in research.
* Some projects that require less staff time may be suitable for participation of night shift staff, and their inclusion should be considered by researchers where possible.
* Flexibility for unplanned events is essential for all researchers and must be considered when developing project timeframes.
* Researchers must endeavour to include care homes in rural or distant locations to ensure representativeness. No care home should be left behind.
* Care home managers should increase the presence of the researcher and project in the care home so that all residents and staff are aware, not just the participants.

**Conclusion:** Interviewing participants on their experiences of care home research projects has revealed unique and useful perspectives on the challenges of integrating projects into the busy care home environment. Twenty recommendations have been made to inform care home associations, research networks and researchers based on the participants’ perspectives.

**Report**

**Background:**

There are approximately 421,000 older adults aged 65+ living in care homes to date1. Many of these residents have complex needs, requiring varied degrees of specialised health care. Out of 14,900 rated care homes, 4% were rated as inadequate and 47% needed improvement, largely due to issues with understaffing, lack of skills, and inadequate management of medicines2. For the necessary improvements to take place, research is required to test new technologies, services, and methods of health care delivery. However, the vulnerability of this population3 and limited resources of care homes2 make this a challenging task. Care home research networks such as ENRICH (Enabling Research in Care Home) have been established to tackle this issue, and to help improve the lives and care of older people in the UK1. Identifying barriers to effective research is essential to improving the quality of care, and this information will help research networks to assist researchers to work with care homes and help tackle their biggest challenges. To do that, the valuable and under-researched experiences of participants in care home research must be explored, so that their unique perspective can inform research practice.

**Aim:** To summarise the findings for an eight-week project exploring the experiences of care home participants, putting forward possible benefits, challenges, and recommendations for future practice.

**Method:**

**Literature Review**

A short systematic narrative review was conducted to identify current research on the experience of research participants in care homes. The research included was used to help identify current work in the area, identify possible themes and to inform data collection for the project. Papers that included the experiences of participants on the any aspect of the research process, from the perspective of researchers, staff, or the participants themselves were included in the review. Papers were excluded if the participant experience was only discussed in terms of the respective interventions and not the research processes.

**Qualitative study**

A small qualitative study was designed. Here, six individuals from different roles from within care homes, including manager, deputy manager, nurse, care assistance, family member and resident. Due to a deterioration in health, no residents were included, and Interviews were carried out with the remaining five participants. The contents were coded and thematically analysed using NVivo 11.

**Results:**

**Literature Review**

Four themes emerged from the thirty articles that were selected for inclusion; practical matters and recruitment; participatory action research; capacity, ethics, and informed consent; and family involvement in care and research. The following themes were used to inform the semi structured interview guide.

**Practical matters and recruitment**

Understanding organizational routine and patterns of communication is considered important to ensure the research project can be successfully conducted and cause minimum disruption4,5. Barriers to recruitment can include scepticism and mistrust of the researchers and their objectives6. It has been suggested that the recruitment process can be improved by having an existing relationship with care home staff, providing clarity on the steps of the project, and increasing buy-in by helping staff develop sense of ownership, and establishing trust with visits prior to the project6. Clear communication within and between researchers and the host care home is a tenet to the success of a project. It has been suggested that the presence of the project should be increased by ensuring that all staff and residents are aware that the research is taking place, not just those participating5. The process of disseminating findings and feedback should be clearly thought out, as it has been found that one-directional dissemination by using a poster resulted in many lower paid staff being unaware of the results4. Autonomy and a sense of purpose are deeply important quality of life factors for care home residents,7 and there is an opportunity for these experiences to be provided through research participation. The importance of research is recognised by care home staff, and recently a study proposed what they consider should be research priorities, which included person-centred care, dignity, appropriate staffing levels, and staff training8. Participation can also provide health care assistants with an opportunity to share their perspective, and provide hope to those who feel undervalued in their work4. If measures are taken by both parties to overcome these practical and communicative barriers, the benefits for all participants can be maximised, and proposed projects that ultimately focus on improving the lives of residents (for example see 9) can be conducted efficiently and effectively.

**Participatory Action Research**

When searching for the experiences of participants in care home research, nine of the results returned were Participatory Action Research based studies. Benefits of research participation of this design has been found to provide the opportunity for participants to express their views; have their experiences and expertise validated, experience being part of something beyond than their own care environments, enjoy seeing meaningful changes take place based on their own ideas and reflections, develop a sense of ownership of a project, which increases adherence to new developments, and helps to overcome scepticism and ‘research fatigue’10–16. Empowerment of participants is a key aim of participatory action research, and the experiences of participants are often a primary objective17. In other research designs, the experiences of participants are more frequently discussed in terms an observation rather than an objective (for example see 18). The potential of missed opportunities for the valuable insight of participants on various aspects of research design and implementation to be explored adds weight to the rationale of this study.

Whilst some recommendations made based on participatory action experiences may not be translatable to all research designs, there are practical challenges that all researchers working with care homes are likely to encounter irrespective of design or epistemology1. For instance, barriers such as unsupportive, fragmented leadership and constrained resources, and facilitators such as efficient teamwork and well-established relationships found in participatory action research and patient public involvement studies19,20 reflect the challenges experienced by researchers conducting clinical trials18 or randomized controlled trials21. Developing a research protocol that fails to fit in with the day-to-day running of the care home, such as those requiring a large time commitment from care home staff, will act as a barrier to uptake of any project22,23. The development of positive relationships, encouraging the sharing of ideas and consulting with staff and residents on implementation tactics, and concise, regular communication using appropriate language will help to facilitate research in care homes by increasing a sense of ownership amongst participants24,25.

**Capacity, ethics, and informed consent**

Five papers focussed on issues around ethical challenges of responsible recruitment of older adults in care homes. Residents may be considered at high-risk of exploitation, be it due to cognitive difficulties, or a potential fear that unwillingness to participate may have an impact on the quality of their care26. Whilst some research projects may be less ethically challenging than others27, the importance of truly informed consent in all cases cannot be overstated28. Older age and less formal education has been found to be associated with impaired understanding; an issue which is made more complex when considering those with declining or fluctuating capacity29, as if a person is unable to understand and retain the meaning of informed consent, the same applies to their understanding of the right to withdraw at any time30,31. The task of recruiting residents with dementia is resource-heavy, and researchers will need to allocate extra time to recruit them following ethical procedures32, which is highly challenging given the difficulties of selecting participants who frequently have multiple health issues and may be at end of life18. Further, the varying degrees between participants of what is considered an acceptable amount of information and overwhelming them with paperwork means that there is no one strategy that can cater to the needs and preferences of all residents31,33. Having a ‘trial run’ of participation to enhance understanding has been found to increase consent to participation, however, this is a resource-heavy task and is not suitable for all research projects such as those involving medicine34. These findings demonstrate the amount of resources required by researchers, staff, and family members for research to be conducted safely, from supplies which are all often extremely limited.

**Family involvement**

Families may be more likely to participate in a retrospective assessment of care for a family member with dementia who had passed away when palliative and end of life care has been of significantly higher standard in factors such as nursing care, odour, and mouth care, and when physicians reported treatment consensus between families and care home staff35. These findings suggest that family may be less likely to participate when care has not always been perceived as optimum, or when incidents that challenge families’ perceptions of staff competency have arisen, such as their resident being treated in an undignified manner36, or in instances of unease when the perceptions of what is best for the family member may not have been congruent between family members and staff37. The residents who have been subject to such experiences can be considered as the most vulnerable, and research is required to help improve their quality of care. Yet, the circumstances surrounding residents’ personal care, such as suspected or potential negligence, or contrasting attitudes within and between staff, family and residents acts as a barrier to potential participants ability and / or willingness to take part in research10,37. This yields a significant issue in care home research, as it limits accessibility to the most at-risk persons within a vulnerable population, who arguably need the help of researchers the most.

**Qualitative study**

The duration of the participant’s roles within their respective care homes ranged from 2 years (nurse, care assistant and relative) and 22 years (manager and deputy manager). The research process was considered by each participant who had their own unique roles and contexts within the care home, and discussed in terms of the challenges they faced in their own professional and personal capacities. All participants understood why research was important, and they each took different benefits from it, and considered participation as an opportunity for their voices to be heard.

**1. Perceptions of research**

The nurse perceived research participation as a benefit as it combatted isolation of the care home from the wider care and research communities, the cause of which was identified as the care home’s small size and rural location. Their nursing team was described as highly motivated to keep up-to-date, but the nurse felt that there was not enough engagement from the wider research community.

*“C2N01: I think that it is beneficial, because as I say we get a bit isolated, and if you’ve got, like, a group that you meet regularly, you lose touch with what’s going on don’t you, if you don’t go to outside of the training days and things; I think you miss a lot of what’s going on. It’s not like working in a hospital setting where you’ve got more access to information. I think it’s totally different in care homes … when you’re sat in a little care home like we are, with just one nurse, and that’s it, it’s totally different, you know”*

The deputy manager, who was still highly involved in the care of the residents identified that the role of a carer is often misunderstood to be an easy job research participation as an opportunity to express that their role is not as easy as it is interpreted. They took their role of a care provider very seriously, and saw the act of research participation as an opportunity for this misunderstanding to be corrected, and for people who normally wouldn’t get to see the day-to-day practice of high quality care to be recognised.

*“A lot of people think you work in a residential home, it’s just sitting down with cups of tea, and it isn’t. So from that side, it’s good for them to come in and think, ‘well actually, there’s a lot goes on in places like this’ … You know, it’s their lives in our ands really, and it’s the last stages of their lives, so... you know, we’ve got to try and make it as perfect as we can for them. And a lot of work goes in that.”*

The care assistant similarly viewed the role of a carer to be misunderstood by people outside of the care home, and saw research participation as an opportunity for their point of view to be expressed, and used to inform people both in and outside of the care environment. Additionally, the care assistant considered the process of being interviewed to beneficial to their confidence, which is something that they struggle with on a personal level, as it provided an opportunity for her expertise and knowledge to be professionally validated by someone taking a specific interest provided an opportunity for her to express her point of view. Perceptions of potential negative effects of participation were not expressed by any participant when asked.

**Recommendation: Allowing staff time to participate in research may help reduce professional isolation, enable staff to inform future practice and enable staff members to develop their professional confidence. These findings may be useful when promoting research to care homes, and researchers may wish to consider including in their engagement strategy.**

**2. The research engagement process**

The theme of research engagement is concerned with the process of involvement with the wider research community. This includes the level of awareness of research networks, method, and approach to engagement from these networks, and level of satisfaction with the current level of engagement. The nurse and the manager were the only two who could explore this at length, as their professional roles were the most affected by these processes. The other participants state that all research opportunities come from the manager downwards. Both the manager and nurse were keen to engage with the wider research community, and both described information-seeking behaviour of new research developments as part of their day-to-day practice. However, they each had contrasting experiences and views of the engagement process.

The manager viewed the care homes current level and approach to engagement with research networks with satisfaction. Their home is reportedly a member of two care home associations that provide information about research opportunities, and the manager regularly attends reference group meetings with the local health authority, which have various projects. The current method for the wider research community to engage with the manager’s care home is to contact the care home associations, who then get in touch with the manager via email to state that a research opportunity has arisen. The manager then makes the decision alone whether to take part in the proposed project or not. The critical factor they considered most important was the time that any project would take to take part was the allocation of staff and time it may take away from residents:

*“CM3M01: Yeah. I mean, I think if a research problem – a research project – is going to be time consuming for the staff, it’s not always the best thing for this home, because the staff here are very geared towards the residents, and they have to spend time with the residents … And we have a lot of staff on duty of course. So if it were to impact, I think anything, if it was to impact on client care, then you would think twice about, doing it.”*

The nurse remained academically engaged with the progress of nursing research, and was passionate about keeping up-to-date with relevant projects and academic developments. Their nursing team were stated to take opportunities to engage with other teams with different specialist teams coming to the care home, and viewed these as opportunities to learn and grow. However, as all research opportunities are fed to their team through the area manager level, they were unhappy with the current level of engagement with the research community. Further, they viewed research participation as such a valuable opportunity to learn, they predicted that the standards of care could drop if the current level of engagement with the research community was not increased. They also expressed an interest in having more involvement in the project selection process, and saw this as an opportunity for the varied backgrounds of the nurses within her team to be utilized, by offering ideas and perspectives to the project selection process that an area manager may not if judging the fit of a project on their own criteria. If this level of engagement was to ensue, they pointed out that information of opportunities may need to be communicated by a variety of means, as not all nurses and other care home staff have consistent access to the same methods of communication as part of their role.

*“I think care homes need to be contacted to say what’s out there. I know they do have regular forums, but that tends to be at the management level, it’s not at the nurse level, and so they can go out to the regular forums … But we don’t get that opportunity to go out and do that, and meet with other colleagues really, apart from the ones you work with … and I’m sure there’s a lot of nurses that’d take advantage of these, if there was more going on locally.”*

Further, the nurse recognised that there was an opportunity for the experience of participation to contribute towards the nursing revalidation process, and could contribute to their reflective practice with critical thinking and awareness of their own practice in a wider context. This indicates that a potential advancement to be made in research recruitment and participation could be to include something to demonstrate this link and show how this can contribute to nursing development.

*“I think we’d just like more I think. Because at the minute, we don’t get much at all. And it would – anything that people that people can come along and bring is very useful to us all. As I say, because you do tend to get isolated in little care home groups, or you know, you work with your small team, you know, and there’s some people that might only work with a couple more nurses, so they don’t see anything outside of that, and their immediate group, you know. Then again, you’ll get some nurses that are quite happy with that, but I think as individuals we’ve all got to keep upskilling, and learning new things.”*

**Recommendation:**

* **Staff below management recognise the value and importance of taking part in research, both in practice and personal development. Whilst the manager may be the most qualified person to decide if a proposed project is of good fit, involving staff in this decision may provide a fresh perspective on how a project may be integrated into practice.**
* **Researchers may benefit from approaching care home associations as part of their recruitment process.**

**3. “What advice would you give to a researcher?”**

Towards the end of the interviews, each of the participants were asked what advice would they give to a researcher. This provided a platform for them to reflect on their previous experiences, things that went well, or not so well, to discuss observations that they had made, comment on things that were well received, share their ideas, and talk about what they would like to see happen in the future, and do so with confidence knowing that they are regarded as an expert of their experience.

Most of the advice offered was regarding the practical fit of research in the care home. This included allocation of time, flexibility and having adequate resources. Avoiding busy times in the routines was a consistent theme across all interviews, including mornings, dinner times, and regularly scheduled professional visitors. Mondays and Fridays have also been identified as particularly busy days in two of the three care homes. Exercising patience and flexibility for unplanned events, such as falls, illnesses, attacks, deaths, staff absence are essential for any researcher or visitor entering the care environment, and it is something that the previous researcher was praised for, particularly at the third care home where they were aware that things hadn’t always gone to plan. The issues of time management, however, were not one sided, as the more senior participants (manager, deputy manager and nurse) all took ownership of the organisation and time management, with the manager being particularly aware that it was an area for improvement. Participants with more senior positions had a sense of ownership for being responsible for finding the time to welcome a researcher into their practice.

In the manager’s case, the fit of research extended beyond practicality into their wider approach to care, and with their wider approach to care; that is, the congruence of the priorities and objectives of the research congruent with the priorities and objectives of the manager’s care home. For instance, they reflected positively upon a previous research project on mobility in older age, where residents were asked to wear belts that monitored their levels of physical activity. The manager views mobility as a very important issue in elderly care, as in their experience, cessation of mobility for any resident is associated with other complications such a decreased social interaction and circulatory health problems, and so monitoring activity levels is an integral component of the care they offer. Both the research method and aim of this project was congruent with the manager’s approach to care, and therefore described by the manager as ‘one that was close to [their] heart’. In addition to this, they also expressed that they would like to receive more information about the impact of the research they take part in.

Professional attributes of the researcher were also discussed, such as demonstrating awareness and respect for the working environment that they are visiting. Dementia awareness and training was also seen as an advantage by all participants, to ensure that interactions with residents were informed and safe for everyone involved. Additionally, personal attributes and social skills of a researcher were deemed as important, i.e., being friendly and approachable, and good with the residents. Again, this was discussed in context of things that went well in the previous project they took part in, and is regarded particularly by the manager and deputy manager and relatives a prerequisite to successful integration and engagement between a care home and a researcher. As both the manager and relative stated, ensuring that any worries, concerns and wishes of the residents and family members are addressed is key to best practice. Therefore, social competence and being able to communicate effectively could be considered essential to patient and personcentred care in research.

*“You know, it’s not just about flexibility, it's about personality as well. They were very good”.*

A recurring topic in the interview with the relative was worry in the elderly residents, and that so much free time can enable them to worry about the smallest things. He stressed that not appearing too formal, and ensuring that any worries or concerns were counteracted with reassurance and making sure that they understand that they know that the presence of a researcher is a positive thing for the care home to take part in, and that risks are minimal. He also mentioned that overhearing and worrying about unfamiliar people could spark unwarranted worry, and that this could be avoided by using a suitable space to conduct research. This was also evident in the interview as we were interrupted several times as the most suitable space for us to use was a connecting room between the care and staff areas. Ensuring that all residents are aware and not afraid of the research project is considered essential. In addition, they noticed that the staff spend a great deal of time on paperwork, and so anything a researcher can do to reduce or condense the amount of documentation involved in the project would benefit the staff and residents by allowing for more time to care.

**Recommendations:**

* **Researchers should be aware of the limited resources available to care homes, and be mindful of restrictions on staff time during project design.**
* **Ensure that best times to contact are established early in the engagement process to ensure communication is effective.**
* **Include time in research design to developing a relationship with the care home as early as possible to establish connections, and familiarise with the residents, staff, and their schedule and culture.**
* **Reduce the amount of administrative effort of the care home where possible.**
* **A friendly and approachable communication style without appearing too formal will help residents feel more comfortable.**
* **Dementia awareness training should be undertaken before entering the care home**
* **Keeping care homes up to date about the progress of the research and showing how their contribution has helped .**

**Discussion:**

A literature review was conducted prior to conducting qualitative interviews with a nurse, manager, deputy manager, care assistant and relative were conducted on their experiences of participants of care home research. The qualitative research found that perceptions of research were largely positive. All participants recognised the value of research, and benefits from participation ranged from personal to professional, and benefits for the practice within the care home itself. On a personal level, the care assistant that took part reported experiencing a boost in personal and social confidence by taking part.

**Recommendation: Managers who identify employees who struggle with confidence could consider them as good candidates for participation.**

Congruency between aims and objectives of the research with the ethos and approach to care of the host care home may increase the success of integration and uptake of the project amongst staff. As previously identified24, topics that are considered personally relevant to participants and relevant to the home are more likely to be participated in. This is reflected in the manager’s interest and fondness of a previous mobility project, which they described as being ‘close to [their] heart’, and described the personal benefits for the residents who participated, as it fulfilled the needs of a sense of purpose and autonomy7. As fifteen research priorities of managers, matrons, registered nurses and care assistants have recently been identified8, providing the decision maker with a logic model explaining the relatedness and impact of the proposed project on these priorities may be a way to increase uptake of research within care homes. The nurse identified that their nursing team would like to get involved in the manager's decision process, which could provide benefits such as a new perspective to an integration problem, and an increase of ownership from participants. Health care employees with passion for research should be considered for research championship roles that can assist researchers with the planning, recruitment and integration of research projects in the care home38. Additionally, if research networks collected data on the reasons why a care home choose to accept or decline a research project, this could be used to help future researchers identify suitable care homes more efficiently, or practical aspects of their projects that they could alter to increase the number of suitable homes.

**Recommendations:**

* **Managers should consider consulting with staff members on project suitability before deciding to accept or decline participation.**
* **Employees or volunteers with a keen interest for research should be considered for research championship roles.**
* **Research networks or care home associations should collect data on the reasons why care homes accept or decline research projects, and provide researchers with this information.**
* **Providing the decision maker with a logic model explaining the potential impact of their project on health care challenges that they consider a priority may be a way for researchers to increase the uptake of their projects.**

The interviews have revealed the importance of focussing on benefits of research participation, and reflect those previously reported22. The manager suggested they would like more information on the impact of projects they took part in, i.e. where the results have been used and where they have influenced change. The nurse saw a great advantage in professional development from participation, referring to how participation encourages reflective practice, and how the experience is relevant to the Nursing & Midwifery Council revalidation process. Formal recognition of efforts has been previously recommended6, yet feedback given in any one format may not be useful for all staff members4. Providing reward in a format for wider use such as nursing revalidation processes, funding applications or Care Quality Commission reports may increase the value of participation.

**Recommendation: Consult with participants at all levels on how formal feedback can be formatted for wider uses to increase its value to them.**

The practical recommendations made by participants largely reflect those documented elsewhere22, in that projects that require a lot of staff hours are less likely to be accepted. Mornings and meal times should be avoided. The researcher should be familiar with the schedule of the care home, and must remain flexible for unplanned events. Two of the interviews revealed potential difficulties of including permanent night staff and agency staff in research. Projects that do not include these staff members may not be representative of the care home workforce, and where possible researchers should take measures to include them. Similarly, the nurse repeatedly described their care home as being isolated from the wider health and research community. Yet as recommended by previous researchers18, an effective strategy to reduce cost and time is to recruit care homes from within the local area, leaving those in more rural locations at risk. Inclusion and representativeness of research is at risk if rural care homes are left behind. Whilst the manager, deputy manager all recognised that they needed to make time for research projects, the wider research community should endeavour to include ‘hard to reach’ participants, as although recruiting from a pool of easily accessible participants may conserve resources, it may be at the expense of representativeness.

**Recommendations:**

* **Research networks should collect data on the prevalence of agency staff in care homes, and identify ways for them to be included in research.**
* **Some projects that require less staff time may be suitable for participation of night shift staff, and their inclusion should be considered by researchers where possible.**
* **Flexibility for unplanned events is essential for all researchers and must be considered when developing project timeframes.**
* **Researchers must endeavour to include care homes in rural or distant locations to ensure representativeness. No care home should be left behind.**

The involvement of family members of care home residents could also be considered an untapped resource for researchers. The relative has an extensive knowledge of the care home residents which could be highly valuable to a researcher, and potential for those that visit frequently to act as a gatekeeper when a researcher is getting to know the residents. They discussed the topic of irrational worry amongst some residents, and suggests that making sure they understand why the researcher is present is essential to ensure they can rest well. It has been suggested that posters and leaflets can help to accomplish this5.

**Recommendation: Care home managers should increase the presence of the researcher and project in the care home so that all residents and staff are aware, not just the participants.**

**Conclusion:**

Interviewing participants on their experiences of care home research projects has revealed unique and useful perspectives on the challenges of integrating projects into the busy care home environment. Managers, nursing staff, care assistants and family members understand the importance and benefits of research, and are willing to participate. Staff members below management level are keen to engage, as this provide personal and professional development opportunities. Appropriate fit of research in terms of practicality and approach to care are key determinants on the likelihood of participation in research projects. Ensuring that the decision makers are given clear information on the immediate and wider benefits of participation could encourage an increase in uptake of research projects. Twenty recommendations have been made to inform care home associations, research networks and researchers based on the participants’ perspectives.

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9.10 Appendix 11 – Progress Report for Abbeyfield (04/16-14/17)

**Progress Report to Abbeyfield Research Trust for period April 2016-April 2017**

**PhD Study Title:** The use of telemedicine for remote health care provision by care homes for older people

**Project timescale:** 3 years, end date: 01.01.18

**Study Background:** Research has shown that older adults that reside in care homes can experience challenges in accessing the healthcare that they need for a variety of reasons. There is a clear need to develop and evaluate new methods of delivering care to older people living in care.

This research is exploring factors that affect the uptake and sustainability of videoconferencing as a method of enabling care home residents to access healthcare. Videoconferencing is where two remote sites are connected via an audio visual link. The main provider in Yorkshire and the Humber region is a hub provided through Airedale NHS Trust. Care homes linked to the hub can seek advice from nurses by accessing the software on a laptop provided by the hub. The service is available all day every day for advice or they can act as a triage and arrange services such as nurses or ambulances. Nurses at the hub can also seek advice from the doctors at the hospital which is then passed onto the care home. For homes that have technical difficulty accessing the hub, a support line is available via telephones.

A survey was sent out in early 2016 to residential and care homes across the Yorkshire and Humber region to map current provision, attitudes and the effect that videoconferencing was perceived to have on a range of outcomes for homes using it. This data has been analysed and the findings are summarised below. Three homes were then selected for in-depth exploration of the factors affecting uptake of videoconferencing and sustainability. Data collection from field work in the homes has been completed and analysed.

One of the outputs from the overall study will be key questions for commissioners and care home managers to consider when determining whether or not to implement videoconferencing in any given care home.

**Videoconferencing in practice: A summary of survey findings from responses from 849 homes:-**

* The majority of responses came from residential care homes.
* Of those that replied only 12 homes reported using videoconferencing as a method of enabling resident access to health care, compared to 106 homes that were not using it.
* Nearly half of respondents that reported not using videoconferencing stated that they would consider using it, but would need to know more.
* Of those that were using it, all rated the system overall as being good or very good.
* In terms of outcomes, respondents rated the system as having a significant impact on improving staff confidence in managing care.

The current phase of this research involves three care homes. Of the three, two are connected to a hospital via the Airedale hub, but have different success in using it and the third is a care home that has no plans to implement it.

**From the survey findings, three care homes were selected for in-depth study:**

**Case study 1:** A residential care home with videoconferencing via the Airedale hub which is well integrated into routine healthcare pathways and had sustained use for approximately 3 years.

**Case study 2:** Where a nursing home was trialling the use of videoconferencing (Trialled same system as described in case study 1)

**Case study 3:** A residential home that does not have videoconferencing and has no plans to implement it

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Case study | Provider | Type | Youngest | Oldest | No. | LA | IMD (Index of Multiple Deprivation) | RUC(Rural/ Urban Code) |
| 1 | Private | Residential | 64 | 98 | 28 | Bradford | 2 | C1 |
| 2 | Private | Nursing | 72 | 99 | 29 | North Yorkshire | 4 | E1 |
| 3 | Voluntary/ not for profit | Residential | 67 | 98 | 39 | Sheffield | 1 | B1 |

The selected research methodology is realist evaluation, which is being used to explore how videoconferencing should work in practice and the optimum conditions for success. Realist interviews have been undertaken with staff, residents and residents’ relatives at each site. These are interviews whereby the interviewer presents an evidence based theory about how of why videoconferencing does or does not work and the interviewee feedbacks on it and presents their ideas of why it may or may not work. The data from care home 2 was used to glean factors that may affect the success otherwise of videoconferencing. Interviewees from care home (1) were then asked to give their opinions regarding the findings obtained from interviews conducted in care home (2) as well as being invited to suggest any further new factors that they believed might be influencing the use of videoconferencing in their home. Relevant frameworks have been created to help explain the findings. From this, theory about what why video conferencing works or does not in different settings was refined further and the final statements about the factors that determine the success of implementation of videoconferencing were then tested through interviews with staff, residents and relatives in care home 3. From this a range of possible questions for care home managers and commissioners are being created to assess a care homes readiness to implement videoconferencing

**Field work**

**Emergent findings of factors that determine the success of implementation:**

* **Leadership, culture and identification with the organisation**
  + Is the culture of the care home one whereby staff members’ commitment to the organisation is enhanced? Do employees want to go to work?
  + Does the home have a high level of communication amongst all levels of staff, in ways that facilitates the development of trusting relationships?
  + Do staff feel empowered by opportunities and resources available to them and through their relationships with both colleagues and senior staff in the home?
  + What are the mangers views of videoconferencing? Are they enthusiastic and likely to advocate for it to be used?
* **Perceived capability**
  + What do staff feel about managing resident physical health care needs? Do they feel capable in their ability to manage resident care?
  + Is their sufficient encouragement from colleagues within the home to provide support for members of staff who lack confidence in meeting the needs of residents or with using technology?
  + What are the manager’s perceptions of videoconferencing? Are they likely to advocate for it to be used and support staff in using it?
  + Do staff at the home require a timelier response from the remote health care providers? Or is the response from the hub on which will engender confidence?
  + Do staff feel able to deal with technical problems such as poor broadband coverage with the support of the hub technical help line?
* **Decision making ability**
  + Do staff have devolved decision making ability about which health care pathway to access? If not, do they have the support in terms of guidance, supervision and training to develop their decision making skills?
* **Observability**
  + Do staff members struggle to convey a situation verbally over telephone? Would they benefit from being able to visually show a situation via an internet connection?
  + Have staff had the opportunity to observe videoconferencing in use and to learn about the pros and cons that may exist when using alternative services?
* **Tension for change**
  + How does the staff group in any one care home feel about health services currently accessed? Do they want an alternative or are they happy with what is provided? Are their views mixed?
* **Learning climate**
  + Is the home sufficiently staffed to allow time for training and learning on the job?
  + What support is available in the home in terms of verbal support and guidance? Are they very active and likely to promote shared learning?
  + Are senior members of staff likely to share their fallibility to less senior members of staff in ways that encourage all members of staff to feel valued?
* **Structural Characteristics**
  + What is the level of staff turnover? Does the home rely heavily on agency staff or is the use of agency staff avoided and if so how?
  + What is the ratio of senior staff to care assistants? Are there sufficient senior staff to support care assistants and provide training on the job, whilst encouraging the flow of information throughout the team?

**Progress with research**

* Data collection complete
* Analysis of data from research sites ongoing and questions for commissioners and care home managers being identified.

**Next steps:**

* Consolidate findings
* Develop questions for commissioners and care home managers to help identify the care homes readiness for the implementation videoconferencing.
* Liaise with commissioners and care home managers to ensure impact from research
* Prepare draft thesis by end December 2017

**Achievements in the last 12 months:**

* Successful grant application from the Wellcome Trust of £2000 (accepted) and from the Alzheimer’s Society £1978 (declined) for an undergraduate student to expand on the PhD study over the summer of 2017. The student is being sponsored by the SURE (Student Undergraduate Research Experience) Scheme. This allows undergraduates to apply to undertake a predefined research topic with the researcher of their choice. For this project, the student will be exploring the participants’ experiences of taking part in this PhD study with a view to informing toolkits used by the ENRiCH (Enabling Research in Care Homes) Network and will be conducted in collaboration with the network. The findings will also help inform a chapter in this final thesis which will consider the challenges of conducting this research in care homes.

Training undertaken during the last year as part of my professional development on the PhD includes;

As part of the Sheffield Undergraduate Research Experience (SURE) Scheme, The University of Sheffield:

* Success on screen
* How to shortlist students for your project
* How to apply for externally funded stipends
* How to interview students for your project

Think Ahead, The University of Sheffield:

* Leadership development workshop
* How to be an effective researcher
* VIVA Survivor
* Public engagement

**Networking/ Impact:**

* Have been liaising with a Clinical Commissioning Group (CCG) in one area where telemedicine has been decommissioned to explore the reasons for their decision and share the findings of my research
* Liaising with the evaluation team at Airedale about their work and findings so far and also gaining knowledge of their evaluations of the Airedale hub.

**Dissemination:**

* Videoconferencing for older adults in care homes: a scoping review submitted to the International Journal of Telemedicine and Applications (Awaiting decision).
* Short paper to be presented at the AAATE (Association for the Advancement of Assistive Technology in Europe) conference in Sheffield, September 11-15 2017
* Lay public engagement presentation at ‘Grey Matters: The Future of Ageing’ (Cafe Scientifique), The Showroom, Sheffield 08.05.17

**Future plans:**

* Abstract to Best Practice in the Care Home Sector Conference, Birmingham, 20/09/2017
* Abstract to the 2017 International Realist Conference, Brisbane, Australia, 24-26 October 2017
* Agree publication plan out of the research and take forward.

Louise Newbould

May 2017

9.11 Appendix 12 - Progress Report for Abbeyfield (08.04.2016)

**Abbeyfield: Progress report**

**Louise Newbould, 08.04.2016**

**PhD Studentship:** ‘Telemedicine for remote health care provision by care homes for older people in Yorkshire and the Humber’

**Project timescale:** 3 years, end date: 01.01.2018

**Synopsis:** Research has shown that health care provision to care homes in the UK is often inadequate in meeting the resident’s needs, with many care home residents reporting having inadequate access to health care services. When face to face contact is not feasible, using an auxiliary form of communication such as teleconferencing may be one way of addressing access to health care.

Recent research from the York Health Economics Consortium has shown videoconferencing in care homes can be effective for reducing hospital admissions; however, more research is required to establish what works, for whom and in what circumstances and respects.

**Progress between start date (01.01.15) and now;**

***For the overall PhD:***

*Academic development*

I have undertaken training in ethics, qualitative research, systematically reviewing the literature, geographic information systems (GIS), referencing software, elite interviewing and presentation skills.

I delivered a paper presentation at ScHARR Postgraduate Research Conference, The University of Sheffield, 25.06. 2015

I have been attending ENRICH (Enabling Research in Care Homes) meetings and events to build up a network of support and advice in conducting my research. The ENRICH Network is a network that has been set up by the NIHR to help improve the recruitment of care home managers in research and to raise awareness or care home research. As part of my involvement with this network, I presented at the ENRICH conference on 07.10.2015. Here I promoted the survey for the project and received informal advice off members of the group on how to build on what I had already done.

*To progress the study:*

*Literature review*

I have reviewed academic literature for definitions of telemedicine and conducted a scoping review of the evidence on videoconferencing in care homes. I am now preparing the work for publication.

*Progress with field work*

I have worked with a range of external stakeholders and started building a list of contacts. This included leading the organisation and facilitation of a workshop for the Special Interest group of the Teleheath and Care Technology theme within the Collaboration for Leadership in applied Health Research and Care; Yorkshire and Humber (CLAHRC YH on 30th September.

These workshops are designed to facilitate the discussion and exploration of relevant issues and to facilitate networking between external stakeholders. Attendees included: care home managers; health care workers; technology providers; researchers; staff from the local authority; from local NHS trusts and commissioners.

The event focused on the pros and cons for technology and care homes and identified a range of attitudes, barriers and enablers to using technology in this setting. These were collated and discussed at the end of the day and were then reviewed to identify possible themes/ questions to include in the survey.

*Survey development and distribution:*

I have developed and distributed a short survey of existing networks of homes across Yorkshire and the Humber to identify those using telemedicine. The survey aimed to explore the use of videoconferencing to access health care in care homes, with a focus on factors that affect the provision and effectiveness of videoconferencing. It will also be used to identify potential research sites for further study in year 2.

Five key steps were identified and followed in developing the survey, these were:

*1. Identify interviewees – Care home managers*

*2. Decide on method of data collection – Semi structured interviews*

*3. Design/ conduct data collection*

*4. Analysis – thematic analysis*

*5. Develop descriptive survey/ tool- survey developed*

Semi- structured interviews with care home managers**:**

A brief topic guide was developed for the semi-structured interviews to allow the exploration of participants’ views and experiences whilst also some structure for cross-case comparability.

The main questions of importance identified from the qualitative interviews were:

* *What is the background to the home? e.g. number of residents, age rage, ethnicity, care needs*
* *How do their residents access health care?*
* *What other digital technologies are used within the care home?*
* *Have managers heard of videoconferencing for health care delivery?*
* *What are managers/ commissioners attitudes to videoconferencing?*
* *How is videoconferencing being used?*
* *What are the positives about using the system?*
* *What are the negatives to using the system?*

The questions were then grouped and an initial draft of the survey was then drawn up and piloted.

**Pilot study**

The survey was piloted by 4 care home managers (the same 4 who were previously interviewed about their use of technology within their care home and their thoughts on the use of videoconferencing). They were asked to provide feedback written feedback on the online (<https://www.surveymonkey.co.uk/r/telemedicine_carehomes>) or hard copy version of the survey.

**Distributing the survey**

Once the final survey had been finalised, it was sent out by post to care home managers in Yorkshire and the Humber. This was then followed up with one reminder letter.

All participants that returned the surveys have been entered into a prize draw by region (South Yorkshire, West Yorkshire, North Yorkshire, East Riding of Yorkshire and Lincolnshire). Each prize draw us a shopping voucher for the value of £25. It was hoped that this would improve the response rate.

**Survey participants**

For this project a care home is defined as ‘any nursing or residential home registered with the Quality Care Commission where mainly older people live’.

Care homes were identified through the Care Quality Commission directory (13th Jan2016) accessible via the website. Care home managers registered at care homes caring for people over the age 65 that are within the CCG Yorkshire and The Humber boundaries (2013) were approached. However, if they were also registered as caring for people under the age of 65 as well they were excluded. NHS care homes were also excluded.

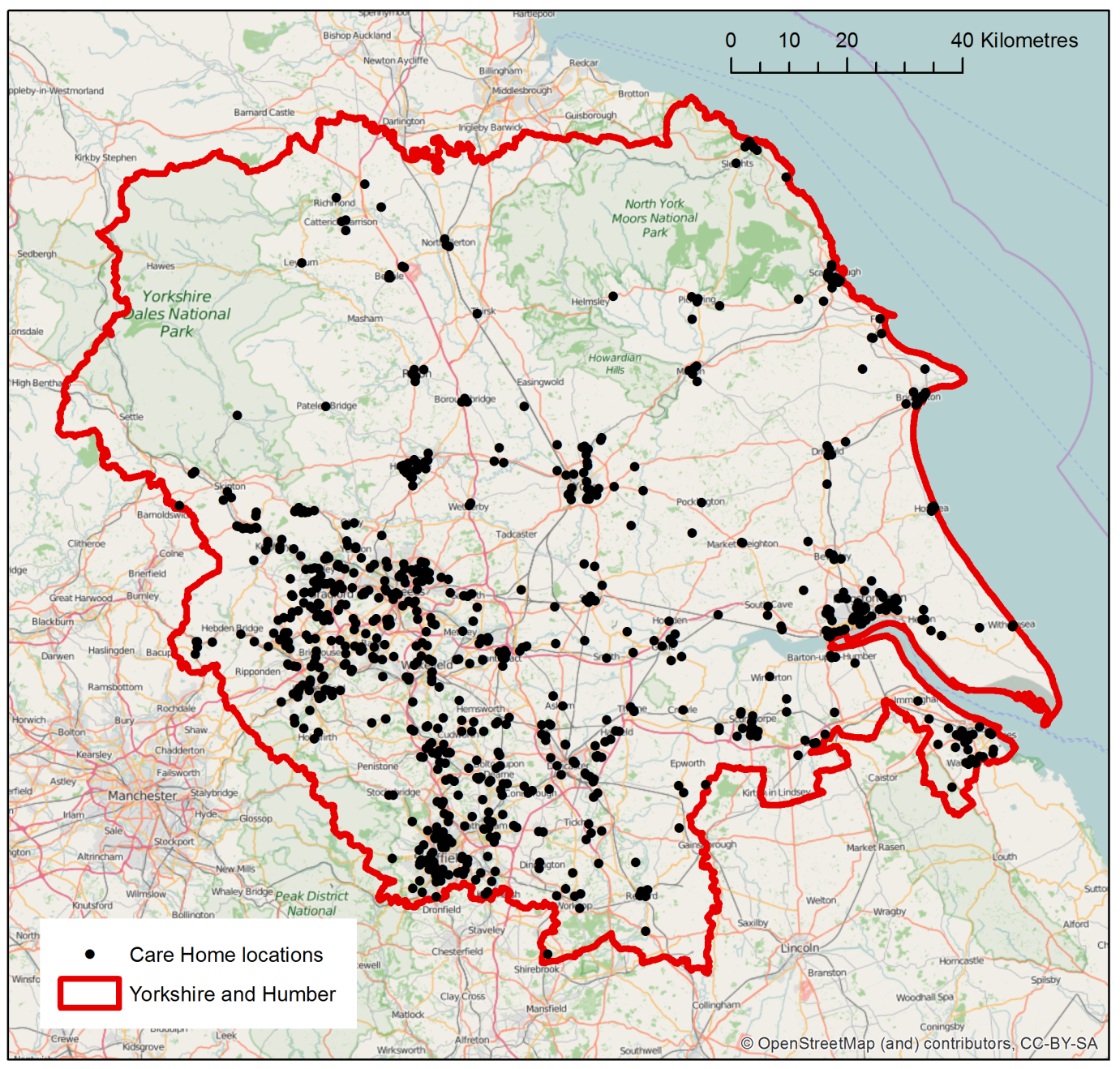


Figure 27: Map showing care homes eligible for survey mail out

**Analysis**

So far I have received 132 responses, including 3 surveys that were completed in the pilot phase. These data is now being analysed using descriptive statistics, with research sites being identified for further research in Year 2.

So far, it is anticipated that a realist evaluation will be undertaken. This will involve 3 sites being explored further to look at what works for whom, in what circumstances and respects. One site will be selected that is using videoconferencing successfully, another in the early stages of using videoconferencing and one that has no plans to implement videoconferencing in the future. It is hoped that this data collection will start in June or July 2016.

1. Corresponding Author. [↑](#footnote-ref-1)