

**Integrating Behavioural Activation and Physical
Activity Interventions for People with Depression and
Type 2 Diabetes Mellitus in Pakistan**

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Abstract

Background

Integrated Behavioural activation (BA) and physical activity intervention have the potential to tackle depression and type 2 diabetes mellitus (T2DM) multimorbidity, however, there is limited research on this approach of integrating BA and physical activity in LMICs. This thesis aimed to adapt an evidence-based integrated BA and physical activity intervention for women with depression and T2DM multimorbidity living in Pakistan.

Methods

A systematic review and meta-analysis was conducted to synthesise the evidence on the effectiveness of physical activity in improving depressive symptoms in people with T2DM. After that, a qualitative study was conducted to explore the experiences, perceptions, and attitudes of people with depression and T2DM, their carers, and healthcare staff about supporting physical activity in people with depression and T2DM in Pakistan. Informed by findings from the systematic review and qualitative study, two consultative workshops were conducted with relevant stakeholders to adapt an integrated BA and physical activity intervention specifically for women with depression and T2DM living in Pakistan.

Results

The systematic review reported that physical activity significantly improved depressive symptoms in people with T2DM. However, this effect was not seen in studies that included only women participants. The qualitative study reported that women faced additional barriers to being physically active compared to men due to prevailing cultural norms and stereotypes associated with femininity. The intervention adaptation study resulted in the adaption of a culturally appropriate BA and physical activity intervention for women with depression and T2DM living in Pakistan. Aligned with the principles of BA, the intervention is primarily focused on women's self-selected routine, pleasurable, and necessary activities.

Conclusion

The research presented in this thesis resulted in an evidence-based culturally adapted integrated BA and physical activity intervention for women with depression and T2DM residing in Pakistan.

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Abbreviations

BA	Behavioural activation
BAcPac	Combined Behavioural activation and Physical Activity Intervention
CBT	Cognitive Behavioural Therapy
DM	Diabetes Mellitus
HbA1c	Haemoglobin A1c
LMICs	Low- and Middle-Income Countries
RCT	Randomized Controlled Trials
SD	Standard Deviation
SMD	Standardised Mean Difference
T2DM	Type 2 Diabetes Mellitus
WHO	World Health Organization

Preface

The thesis is comprised of 3 parts.

Part I: Background

In part I, background information about the topic under consideration is presented. This part consists of two chapters.

Chapter 1: Introduction

In this chapter, background information about depression and type 2 diabetes mellitus (T2DM) multimorbidity is presented. Various pharmacological, psychological, and behavioural interventions available for their management are discussed and it is argued that several factors limit the feasibility of these approaches in low- and middle-income countries (LMICs). After that, available evidence about Behavioural Activation (BA) and physical activity in the management of depression and T2DM is presented, and it is debated whether integrated BA and physical activity intervention has the potential to tackle this multimorbidity in people living in resource constraint settings.

Chapter 2: Aims and objectives

In this chapter, the overall aim of the thesis, and the three specific objectives to achieve the aim, are presented.

Part II: Methods and results

In part II, the three studies conducted as part of the PhD are presented. This part consists of three chapters.

Chapter 3

Chapter 3 is a systematic review and meta-analysis of the effects of physical activity in people with depression and T2DM. The study has been published as a review article:

Arsh, A., Afaq, S., Carswell, C., Bhatti, M. M., Ullah, I. & Siddiqi, N. (2023).
Effectiveness of physical activity in managing co-morbid depression in

adults with type 2 diabetes mellitus: A systematic review and meta-analysis.
Journal of Affective Disorders, 329, 448-459.

I drafted and registered the review protocol, performed searches in multiple databases, screened retrieved reports, extracted, and synthesised data, and wrote up the final paper. My supervisors (Claire Carswell (CC), Najma Siddiqi (NS), and Saima Afaq (SA)) assisted in the conception and design, reviewed the protocol, provided guidance for data synthesis, and critically appraised the final paper. My colleagues (Mujeeb Masud Bhatti (MM) and Irfan Ullah (IU)) performed screening and data extraction. They also reviewed the final paper.

Chapter 4

This chapter describes a qualitative study with the objective to explore experiences, perceptions, and attitudes of people with depression and T2DM, their carers, and healthcare staff about supporting physical activity in people with depression and T2DM in Pakistan. This study has been published as an original article:

Arsh, A., Afaq, S., Carswell, C., Coales, K. & Siddiqi, N. (2023). Barriers & facilitators to physical activity in people with depression and type 2 diabetes mellitus in Pakistan: A qualitative study to explore perspectives of patient participants, carers and healthcare staff. *Mental Health and Physical Activity*, 25, 100542.

I drafted the protocol, collected, and analysed the data and wrote up the final paper. My supervisors (CC, NS, and SA) assisted in conception and design, reviewed the protocol, provided guidance for data analysis, and critically appraised the final paper. My colleague (Karen Coales (KC)) assisted in framing the themes and proofreading the final paper.

Chapter 5

This chapter presents the adaptation process to adapt an integrated BA and physical activity intervention for women with depression and T2DM living in Pakistan. This study

is not published yet, but it is planned to submit it to a peer reviewed journal “Mental Health and Physical Activity” for publication.

Arsh, A., Afaq, S., Carswell, C. & Siddiqi, N. (2024). Adaptation of an integrated Behavioural Activation and physical activity intervention for women with depression and type 2 diabetes mellitus in Pakistan. [Unpublished Manuscript]

I drafted the protocol, conducted the consultative workshops, collected the data and wrote up the final paper. My supervisors (CC, NS, and SA) assisted in conception and design, reviewed the protocol, provided guidance for conducting the workshops, and critically appraised the final paper.

Part III: Discussion

In part III, a discussion of the work carried out is presented. This part consists of one chapter.

Chapter 6: Discussion

In this chapter, the summary of key findings and methods used in the studies are discussed. In addition, implications for practice, policy and research are described. Furthermore, strengths and limitations of the work presented in this thesis are highlighted. At the end, the overall conclusion of the thesis is presented.

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Finally, and most importantly, I would like to thank to all the participants who participated in the research studies as none of this would have been possible without their participation.

Declaration

I declare that this thesis is a presentation of original work, and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as references.

The thesis is prepared according to “Journal Style Thesis” format. The work presented in this thesis has partly been disseminated through the following:

Journal articles

Arsh, A., Afaq, S., Carswell, C., Bhatti, M. M., Ullah, I. & Siddiqi, N. (2023). Effectiveness of physical activity in managing co-morbid depression in adults with type 2 diabetes mellitus: A systematic review and meta-analysis. *Journal of Affective Disorders*, 329, 448-459. <https://doi.org/10.1016/j.jad.2023.02.122>

Arsh, A., Afaq, S., Carswell, C., Coales, K. & Siddiqi, N. (2023). Barriers & facilitators to physical activity in people with depression and type 2 diabetes mellitus in Pakistan: A qualitative study to explore perspectives of patient participants, carers and healthcare staff. *Mental Health and Physical Activity*, 25, 100542. <https://doi.org/10.1016/j.mhpa.2023.100542>

Conference abstract

Arsh, A., Afaq, S., Carswell, C. & Siddiqi, N. (2024). Adaptation of an integrated Behavioural Activation and physical activity intervention for women with depression and type 2 diabetes mellitus in Pakistan.

Presented at the Primary Care Diabetes Association (PCDA) Symposium held at MoveNPick Hotel Karachi Pakistan on 17-18th February 2024.

Part I: Background

Chapter 1: Introduction

1.1 Depression

According to World Health Organization (WHO), depression is “a mental disorder characterized by persistent feelings of sadness and a lack of interest or pleasure in previously rewarding or enjoyable activities” (WHO, 2020a). In clinical settings, the term “depression” is synonymous with clinical depression or major depressive disorder (Fekadu et al., 2017, Truschel, 2020). It is important to differentiate depression from general feelings of despair and sadness because depression is a mental illness while general sadness is a normal emotion. It is suggested that the symptoms of clinical depression usually persist for at least two weeks while general mood fluctuations tend to resolve within a few hours to days (APA, 2013, Gautam et al., 2017). Moreover, persistent negative thought patterns such as suicidal inclinations and hopelessness are most commonly indicative of depression because these signs are usually not present in temporary emotional responses (Truschel, 2020).

According to WHO, about 5% of the world's population suffers from depression (WHO, 2023). It is also reported that depression affects 1 in 6 individuals in their lifetime (Otte et al., 2016, Gold et al., 2020). Research studies showed that the prevalence of depression has increased dramatically in recent years. Just in the last 3 decades, the number of people suffering from depression has increased from 172 million to 264 million, an increase of about 49% (Liu et al., 2020, WHO, 2023, WHO, 2020a).

Although the prevalence of depression differs across regions and countries, it is evident from the literature that depression is common in all parts of the world and is one of the main causes of disease-generated disability worldwide (Vos et al., 2017, Vigo et al., 2016). The detrimental effects of depression on the individual and society are widely described in the literature (Aktürk et al., 2019, de Raykeer et al., 2019, Clayborne et al., 2019, Troubat et al., 2021). Depression has a negative impact on sleep, diet, emotions, relationships, behaviour, concentration, and other areas of life (Ingram et al., 2020, Bremner et al., 2020, Bergmans et al., 2019, Montejo et al., 2018, Nouwen et al., 2019,

Sartorius, 2018). Moreover, depression is associated with an increased risk of premature mortality. It is estimated that people with depression usually die 8 years earlier than their counterparts without depression (Pratt et al., 2016). Many studies have highlighted the huge financial costs associated with depression (König et al., 2020, Doran and Kinchin, 2019). According to conservative estimates, the global economic cost of depression and anxiety is US\$1 trillion per year (Chisholm et al., 2016, WHO, 2023).

1.1.1 Depression in low and middle-income countries

It is reported that more than 80% of those with depressive disorders live in LMICs (which include approximately 75% of the world's population) (Yatham et al., 2018, WHO, 2023, Rathod et al., 2017). Poverty, social inequality, rapid population growth, food insecurity, illiteracy, financial distress, high prevalence of communicable and non-communicable diseases, and high burden of physical and mental disabilities are some of the factors responsible for the growing burden of depression in LMICs (Cristóbal-Narváez et al., 2020, Naveed et al., 2020). Moreover, armed conflicts, natural disasters and environmental stressors can also contribute to increase the prevalence of depression in LMICs (Cristóbal-Narváez et al., 2020).

Despite the high prevalence of depression in LMICs, services for the management of depression in these countries are mostly insufficient (WHO, 2020a). According to WHO estimates, 76–85% of people with depression residing in LMICs remain deprived of treatment (WHO, 2020a). Moreover, It is also reported that only 1 out of 27 people with depression in LMICs has access to even minimally adequate mental health services (Thornicroft et al., 2017). It is estimated that the majority of LMICs spend less than US\$2 annually per person on the management of mental illnesses. On the other hand, high-income countries spend more than US\$50 annually per person, for the prevention and management of mental illnesses (WHO, 2014, Chisholm et al., 2016). This large investment gap likely contributes to the poor mental health and well-being of people residing in LMICs (Chisholm et al., 2016). The high cost of medication, lack of regular clinician appointments, limited access to treatment, unavailability of insurance, workforce shortages and sociocultural barriers such as stigma associated with mental illnesses are

some of the factors which may adversely influence access to appropriate treatment for depression in LMICs (Rathod et al., 2017, Luitel et al., 2017, Petersen et al., 2017). In addition, the lack of mental health policies and legislation in LMICs also significantly impede delivery of mental health services in these countries (Hossain and Purohit, 2019, Ngui et al., 2010).

All South Asian countries are classified as LMICs (Bank, 2022), and face similar barriers in providing mental health services (Hossain et al., 2017, Ogbo et al., 2018, Naveed et al., 2020, Rathod et al., 2017, Sharma and Razzaque, 2017, Hossain et al., 2020). High-quality epidemiological studies on mental disorders are limited and thus reliable data about depression in South Asia is not available. Moreover, people tend to underreport mental disorders in this region due to stigma (Karasz et al., 2019, Vaishnav et al., 2023), therefore it is difficult to estimate the exact burden of depression in South Asia. However available evidence suggests that the prevalence of depression in South Asian countries ranges from 3% to 4.4% (Ogbo et al., 2018).

1.1.2 Depression in women

Compared to men, women have a 1.6 to 2.0-fold greater risk of developing depression (Ferri et al., 2023, Albert, 2015, Baxter et al., 2014). To explain the differences in depression between men and women, various hypotheses have been proposed and evaluated. Evidence suggests that differences in prevalence rates of depression between men and women are similar in both high-income countries and LMICs (Rai et al., 2013, Baxter et al., 2014, Salk et al., 2017). Based on this evidence, studies propose that the difference in risk might be predominantly caused by biological sex variations and less by other potentially confounding psychosocial and economic factors (Albert, 2015, Eid et al., 2019). This argument is supported by evidence from studies that showed a role of oestrogen in the emergence of depressive symptoms (Albert, 2015, Eid et al., 2019). Moreover, the higher risk of depression during times when ovarian hormone levels are drastically reduced or fluctuate, such as during pregnancy and peri-menopause, also supports the notion that the higher risk of depression among women is due to biological sex variations (Gava et al., 2019, Gębka et al., 2023, Jenabi et al., 2021, Eid et al., 2019).

Although biological variations may be a predominant factor that explains the high prevalence of depression among women, psychosocial, and economic factors cannot be overlooked, particularly in the context of LMICs (Lund et al., 2010, Corcoran et al., 2021). Some of the factors that might contribute to the higher prevalence of depression among women include dependence on a male partner, economic marginalization, burden of domestic work, a lack of autonomy and deprivation from the decision-making process and fear of physical or sexual abuse (Insan et al., 2022, Palfreyman, 2021, Mollel et al., 2021, Atif et al., 2016).

1.2 Diabetes mellitus

According to World Health Organization (WHO), diabetes mellitus (DM) is “a group of metabolic disorders characterized and identified by the presence of hyperglycaemia in the absence of treatment” (WHO, 2019). Many physiological dysfunctions can be associated with DM but one of the most important clinical manifestations of DM is high levels of blood glucose (Kesavadev et al., 2021, Dall et al., 2019). Defects in insulin secretion and/or insulin action are the primary causes of hyperglycaemia in DM (Petersen and Shulman, 2018, Campbell and Newgard, 2021, Edgerton et al., 2017). The global prevalence of DM is 9.3% and about 463 million people suffer from DM worldwide. The prevalence of DM is rapidly rising and it is predicted that its prevalence may rise to 10.2% (578 million cases) by 2030, which is about a 25% increase in just one decade (Saeedi et al., 2019). Globally, about 11.3% of deaths occur due to DM (Saeedi et al., 2020). According to WHO, mortality from DM increased by 70% in the last two decades (WHO, 2020c, WHO, 2020d). Moreover, the global health expenditure on DM is about 727 billion US dollars annually (Saeedi et al., 2019).

Broadly, DM can be categorized into two types: type 1 and type 2. In type 1 DM (T1DM), there is absolute insufficiency of insulin secretion while in type 2 DM (T2DM) there is insulin resistance and relative deficit of insulin secretion. Other types of DM include gestational diabetes (associated with pregnancy) and maturity onset diabetes of the

young (associated with mutations in genes) (Vana et al., 2019, Solis-Herrera et al., 2018, Egan and Dinneen, 2019). T2DM is the most prevalent type of DM worldwide. It is reported that T2DM accounts for about 90% of total DM cases (Tao et al., 2015, Dunachie and Chamnan, 2019). Physical inactivity, obesity, smoking, cardiovascular diseases, depression and family history are some of the commonly reported risk factors for T2DM (Cole and Florez, 2020).

1.2.1 Diabetes mellitus in low and middle-income countries

The burden of DM is rising more rapidly in LMICs compared to high income countries (WHO, 2020b, Zhou et al., 2016). It is reported that 4 out of 5 people with DM live in LMICs and it is expected that the incidence of DM will increase much faster in LMICs compared with high-income countries in the coming years (Dunachie and Chamnan, 2019, IDF, 2017). It is estimated that approximately 75% of global diabetes burden is currently carried by LMICs (Manne-Goehler et al., 2019). The exact causes of the rapid increase of DM in LMICs are not clear, but it is reported in the literature that abrupt increases in urbanization, industrialization, and globalization might be the reason for the growing burden of DM in these countries (Dessie et al., 2020, Cheema et al., 2014). There are consistent reports in the literature that mortality and morbidity rates of DM are also much higher in LMICs compared with high-income countries (WHO, 2020c, WHO, 2020d, Manne-Goehler et al., 2019, Owolabi et al., 2018, Misra et al., 2019).

The healthcare systems in LMICs are facing serious challenges and are unable to cope with the high burden of DM cases (Manne-Goehler et al., 2019, Hills et al., 2018b, Mohan et al., 2020). Delay in early detection of DM is a main reason for high rates of complications in these countries. Inequality, inadequate funding, and high out of pocket expenditures are some of the factors that might affect the ability of healthcare systems in these countries to respond well to the DM epidemic (Hills et al., 2018b). Paucity of reliable data and lack of effective health policies are also reported to be the main driving factors for poor response to managing the increase in DM in LMICs (Correia et al., 2019, Haque et al., 2020, Allen et al., 2017). In short, the highly disparate, resource-limited healthcare systems in LMICs are ineffective in preventing and managing the high burden of DM.

DM is growing disproportionally in South Asian countries (Hills et al., 2018a, Singh et al., 2019). According to conservative estimates, about 84 million people suffer from DM in South Asia and the estimated annual cost of diabetes care in this region ranges from 483 US dollars to 2637 dollars per patient (Singh et al., 2019). According to the International Diabetes Federation, across the globe, prevalence of DM is highest in Pakistan (30.8%) (Sun et al., 2022).

1.2.2 Diabetes mellitus in women

Globally, DM prevalence in men and women is similar (10.8% in men vs. 10.2% in women) (Sun et al., 2022). However, DM-related adverse consequences are reported to be more severe among women (Kapur and Seshiah, 2017, Harding et al., 2019). For example, evidence suggests that DM increases the risk of cardiovascular diseases by four times in women compared with two times in men (Norhammar and Schenck-Gustafsson, 2013, Henning, 2018, Kautzky-Willer et al., 2016).

Biological factors such as differences in sex hormones, body composition and energy metabolism might be responsible for the high prevalence of DM-specific complications in women (Kautzky-Willer et al., 2016, Cole and Florez, 2020, Peters and Woodward, 2018). Limited access to healthcare facilities, limited opportunities to perform physical activity, high prevalence of mental health problems and social and economic marginalization are some of the additional factors accounting for the high risk of developing DM complications in women, particularly in LMICs (Ali et al., 2022, Aikaeli et al., 2022).

1.3 Depression in people with type 2 diabetes mellitus

The array of physical impairments associated with T2DM imposes a life-long psychological burden (Pinchevsky et al., 2020, Davies, 2019). In comparison to the general population, people with T2DM are 15-28% more likely to develop depression (van Dooren et al., 2013, Mezuk et al., 2008, Nouwen et al., 2010, Zhuang et al., 2017). A multitude of research studies support the fact that the prevalence of depression is much

higher in people with T2DM, compared to people without T2DM (Reus et al., 2017). Globally, 28% of people with T2DM suffer from depression (Khaledi et al., 2019, Li et al., 2019).

There is a bidirectional association between depression and T2DM. It is estimated that people with depression have a 34% higher risk of developing T2DM while people with T2DM have a 28% higher risk of developing depression (Zhuang et al., 2017). In simple terms, the consequences of one condition include an increase in the risk of developing the other condition. However, the association between depression and T2DM is more complex. Depression and T2DM share many common aetiological factors (Andreoulakis et al., 2012, Chireh et al., 2019). For example, physical inactivity increases the risk of both depression and T2DM. Similarly, many environmental, genetic, and behavioural factors act as shared risk factors for depression and T2DM (Hermanns et al., 2013, Sartorius, 2018). In addition, several complex mechanisms have been proposed in the literature to describe the association between depression and T2DM. Shared inflammatory pathways, common metabolic factors and involvement of the hypothalamic-pituitary-adrenal axis in the pathophysiology of both depression and T2DM are some of the suggested mechanisms to illustrate the complex interaction of depression and T2DM (Alzoubi et al., 2018, Nouwen et al., 2019).

Depression among people with T2DM can lead to social marginalization and low productivity which in turn leads to low self-esteem and reduced quality of life (Chireh et al., 2019). Depression also increases the risk of developing DM-specific secondary complications (Hermanns et al., 2013). People with depression and T2DM are 36% more likely to develop microvascular complications and 25% more likely to develop macrovascular complications compared to people with T2DM alone (Lin et al., 2010). Similarly, people with depression and T2DM have a 46% higher risk of death as opposed to their counterparts without depression (van Dooren et al., 2013).

1.3.1 Depression in people with type 2 diabetes mellitus in low and middle-income countries

It is reported that the consequences of physical and mental health problems are much more debilitating in LMICs (Javed et al., 2021, Meghji et al., 2021, Mendenhall et al., 2012, Murphy et al., 2020). In the majority of LMICs, even basic healthcare facilities are scarce, therefore management of people with depression and T2DM in these countries is seldom considered by the healthcare systems (Wright et al., 2020). The estimated prevalence of depression in people with T2DM living in LMICs is 35.7% (Mendenhall et al., 2014). The overall health system cost of depression among people with T2DM in LMICs has not been determined. However, considering the longstanding nature of depression and T2DM and the complications associated with these conditions, it is likely that the cumulative cost to tackle this multimorbidity in LMICs will be enormous (Lund et al., 2010).

Prevention, timely diagnosis, and treatment of depression among people with T2DM is critical because poor depression care is strongly associated with poor T2DM prognosis (van Dooren et al., 2013). However, the existing evidence suggests that LMICs fail to produce national-level policies to prevent and manage depression in people with T2DM (Mendenhall et al., 2012). In many of these countries, mental health problems associated with communicable and non-communicable diseases are underestimated. Stakeholders such as clinicians and policymakers consider depression symptoms to be the normal consequence of the underlying disease, rather than a clinical condition warranting treatment, and therefore depression frequently remains undiagnosed and untreated (Rezia et al., 2018, Mendenhall et al., 2012, Mendenhall et al., 2014).

It is reported that the prevalence of depression among people with T2DM residing in South Asian countries is considerably higher than the estimated global prevalence rates. The prevalence of depression among people with T2DM in South Asian countries was reported to be 44.5% in one study (Kalra et al., 2020), while another study reported the prevalence in 3 South Asian countries (Pakistan, Bangladesh, India), as 40% (Uphoff et al., 2020b). There is a scarcity of evidence regarding the barriers to the effective

management of depression in people with T2DM. The lack of mental health support in diabetes care settings is considered to be one of the major barriers to the timely diagnosis and treatment of depression in this population (Mendenhall et al., 2012). Other general barriers such as poverty, illiteracy, negligence, stigma and limited availability of resources also contribute to the poor response of South Asian countries to the prevention and management of depression in people with T2DM (Rezia et al., 2018).

1.3.2 Depression in women with type 2 diabetes mellitus

As is the case for the general population, evidence suggests that women with T2DM have a higher prevalence of depression compared to their male counterparts (Barbosa et al., 2022, Pan et al., 2010). The prevalence of depression among women with T2DM ranges from 24% to 34% while prevalence among men ranges from 15.8% to 23% (Farooqi et al., 2022, Khaledi et al., 2019, Wang et al., 2019). Although the exact prevalence of depression among women with T2DM living in LMICs is not known, estimates of depression prevalence are higher in women with T2DM than men living in these countries (Kalra et al., 2020, Mendenhall et al., 2014, Mendenhall and Weaver, 2014, Uphoff et al., 2019). Biological and psychosocial factors responsible for the higher prevalence of depression among women might also explain the higher prevalence of depression in this population (Shea and Owens-Gary, 2009, Deischinger et al., 2020, Peters and Woodward, 2018, Kautzky-Willer et al., 2016).

1.4 Management of depression in people with type 2 diabetes mellitus

The management of depression in people with T2DM is much more challenging compared to the general population (Baumeister et al., 2014). Therapists must consider symptoms and complications of T2DM when treating depression in people with T2DM. Equal importance should be given to psychological and physical outcomes during depression treatment in people with T2DM (Petrak and Herpertz, 2009, Petrak et al., 2015, Kulzer et al., 2013). From a psychological point of view, goals of the treatment should include minimizing thoughts of suicide associated with depression, reducing depressive symptoms, preventing relapse of depression, building coping strategies to

prepare the individual for positive changes in their lifestyle and educating them about the importance of self-management strategies. From a physical perspective, goals of depression treatment in T2DM should include maintaining optimal blood glucose levels and preventing T2DM-specific complications (Andreoulakis et al., 2012). Several pharmacological, psychological, and behavioural interventions are available for the management of depression in people with T2DM (Andreoulakis et al., 2012, Baumeister et al., 2014).

1.4.1 Pharmacotherapy for the management of depression

Pharmacotherapy relates to the use of antidepressant medications, which is the most common approach for treating depression in clinical settings (Bot et al., 2019, Petrak and Herpertz, 2009, Kivimäki et al., 2010, Burcu et al., 2017, Kivimäki et al., 2011). Of the different classes of antidepressants, selective serotonin reuptake inhibitors (SSRIs) are the most widely investigated class of medication for the management of depression in people with T2DM. The available research suggests that SSRIs improve both depressive symptoms and glycaemic control in people with depression and T2DM. There are consistent reports in the literature that SSRIs are effective, tolerable, and safe in this population (Markowitz et al., 2011, Baumeister et al., 2014, Bot et al., 2019). Other classes of antidepressants such as tricyclic antidepressants and serotonin-norepinephrine reuptake inhibitors (SNRIs) are reported to be effective in managing depressive symptoms in people with depression and T2DM, however, their effect on glycaemic control are not well-established (Bot et al., 2019, Hardy et al., 2007, Deuschle, 2013, Lustman et al., 1997, Ibrahim et al., 2017, Himmerich et al., 2006).

The existing evidence supports the use of antidepressants particularly SSRIs for managing depression in people with T2DM. However, as for other medications, antidepressants can cause a wide range of side effects and adverse reactions. Decreased libido, insomnia, gastrointestinal problems, weight gain, and withdrawal effects are some of the commonly reported side effects of antidepressants (Berwian et al., 2017). Moreover, antidepressant medications relieve depressive symptoms by acting on neurotransmitter pathways in the brain, however, they do not address the psychosocial

aspects which may be driving or maintaining depression. High costs of, and poor adherence to medications are some additional factors, which may limit the use of antidepressants in people with T2DM (Simson et al., 2008, Gautam et al., 2017).

1.4.2 Psychotherapy for the management of depression

Psychotherapy i.e., the treatment of psychological issues through talking therapy and counselling is considered a mainstay of treatment in the management of depression. Several psychological therapies have been devised to manage depression in people with T2DM. Of these, cognitive behavioural therapy (CBT) is a widely studied psychotherapy approach. Unlike some other forms of psychotherapy, CBT is highly structured and time limited. These characteristics make it more feasible than other forms of psychotherapies. High-quality systematic reviews have reported that CBT is highly effective in alleviating depressive symptoms in people with T2DM (Li et al., 2017, Wang et al., 2017, Uchendu and Blake, 2017). Although there is limited evidence regarding other forms of psychotherapy for managing depression in people with T2DM, available research studies showed that other therapies such as psychodynamic psychotherapy are also effective in people with T2DM (Baumeister et al., 2014, Simson et al., 2008, Ebert et al., 2017, Chapman et al., 2015). Regarding the positive effects of psychotherapy on glycaemic control, the available evidence is unconvincing (Bot et al., 2019, Baumeister et al., 2014, Uchendu and Blake, 2017, Li et al., 2017, Chapman et al., 2015, Xie and Deng, 2017, Winkley et al., 2020). A systematic review and meta-analysis that included 70 randomized controlled trials (RCTs) concluded that psychotherapy has minimal clinical benefit in improving glycaemic control in people with T2DM (Winkley et al., 2020). Altogether, high-quality research supports the application of psychotherapy for the management of depression in people with T2DM but its effects on glycaemic control are inconclusive.

Certain factors limit the use of traditional approaches to psychotherapy (DeRubeis et al., 2008, Cuijpers et al., 2013, Cuijpers and Gentili, 2017). Most importantly, only highly skilled mental health specialists can deliver the traditional psychotherapeutic interventions, due to which these approaches may not be feasible in resource-limited settings (Drake et al., 2014, Alloh et al., 2018, De Sousa et al., 2020). In addition, frequent

visits for psychotherapy sessions from several weeks to years may make some psychotherapeutic approaches more challenging for people with depression and T2DM (Wiles et al., 2016, Van Dyke, 2018).

1.4.3 Behavioural lifestyle interventions for the management of depression

Besides pharmacological and psychological interventions, therapists may provide support for people with depression and T2DM to improve self-care and make positive lifestyle changes to address health risk behaviours (Sarris et al., 2014, Group, 2014). Generally, these interventions such as increasing physical activity and dietary changes can be classified as behavioural or lifestyle interventions (Lv et al., 2017, Lv et al., 2022).

1.5 Behavioural Activation

Behavioural Activation (BA) is a psychotherapeutic approach that aims to enhance pleasurable and meaningful behaviours and reduce maladaptive behaviours (Janssen et al., 2021, Dimidjian et al., 2011). The concept of BA stems from the behavioural component of CBT (Jacobson et al., 1996). The phrase “Behavioural Activation” in literature was first used by Hollon and Garber in 1990 to describe the behavioural component of CBT (Hollon and Garber, 1990). However, there is consensus that the concepts underlying BA were first developed by Lewinsohn and colleagues in 1970 but they did not use the name BA for their approaches (Kanter et al., 2012, Dimidjian et al., 2011, Kanter et al., 2010, Zeiss et al., 1979). The main turning point in the history of BA was the study of Jacobson et al. (1996), who performed a component analysis of CBT to assess effects of BA (the behavioural component of CBT) in comparison to the full package of CBT. They concluded that the short and long-term effects of BA are equivalent to effects of the full package of CBT (Jacobson et al., 1996). Based on these findings, BA emerged as a stand-alone intervention for the management of depression (Jacobson et al., 2001).

BA is a third-generation behavioural therapy. The first two generations of behavioural therapies have the common presumption that various cognitive, emotional, and

physiological conditions induce dysfunctional behaviours and, hence, treatment strategies of these approaches are mainly focused on abolishing or minimizing the problematic internal events (Carvalho et al., 2017). In contrast to these traditional approaches, third generation behavioural therapies not only focus on the reduction of the symptoms but also aim to considerably increase engagement in the activities, in which the subject finds value. In short, these approaches consider more comprehensive life goals rather than just treatment of the symptoms (Hayes, 2004, Micallef-Trigona, 2016, Carvalho et al., 2017, Stamp, 2019). BA strives to activate individuals with depression, so that they increase pleasurable experiences in their lives (Nyström, 2018, Lewinsohn et al., 1976).

People with depression often lack positive reinforcement. In simple words, depression keeps individuals from performing enjoyable activities, and as a result the existing depressive symptoms get worse (Janssen et al., 2021, Hardy et al., 2015). As the depressive symptoms get worse, this further reduces the person's engagement in meaningful activities, and thus the symptoms again exacerbate. If not treated, this vicious cycle repeats itself, resulting in devastating consequences. BA attempts to reverse or at least break this vicious cycle by reengaging people with depression in their lives by applying focused activation strategies (Kanter et al., 2012, Kanter et al., 2010).

The first step in BA treatment is the monitoring of activities and the mood of individuals with depression either through specific activity monitoring charts or through other means (writing on plain paper/ manuals/ mobile apps). Tracking activities and mood helps the person understand how their mood fluctuates with certain activities. In other words, it assists in recognizing the relationship between what individuals with depression do and how they feel (Kanter et al., 2010, Jacobson et al., 2001). Through these strategies, the behaviour that helps the person feels better, and the activities that worsen the symptoms of depression, are identified. Once the association of existing activities with mood is established, the next step in BA treatment is to determine which activities to focus on to improve mood. Generally, these activities are goal-oriented, enjoyable, and meaningful to the individual. Engagement in these activities will provide positive reinforcement to

people experiencing depression and consequently will improve their depressive symptoms (Belvederi Murri et al., 2019, Pentecost et al., 2015, Dimidjian et al., 2011).

There is a growing body of literature which supports the use of BA for the management of depression (Belvederi Murri et al., 2019, Orgeta et al., 2017). The most recent Cochrane review concluded that BA is more effective than antidepressants, while it is no less effective than other psychological therapies such as CBT. BA is as acceptable as other interventions (antidepressants, CBT) for the management of depression. Moreover, the review highlighted that BA is more effective for moderate to severe depression than for mild depression (Uphoff et al., 2020a). The empirical evidence supports the use of BA for treating people with depressive symptoms (Ekers et al., 2014, Shinohara et al., 2013, Cuijpers et al., 2008, Ekers et al., 2008, Janssen et al., 2021, Gilbody et al., 2024).

BA is applicable and feasible in resource-limited settings because it is simple, flexible, cost-effective, and easy to administer (Soucy et al., 2017, Kanter et al., 2010, Kanter et al., 2012). Another important point that makes BA a preferred treatment option, particularly in LMICs, is the fact that BA can be effectively delivered by non-specialists (Ekers et al., 2011, Aslam et al., 2022).

1.5.1 Behavioural Activation for the management of depression in people with type 2 diabetes mellitus

There is limited literature regarding the effectiveness of BA in the management of depression in people with T2DM. Naik et al. (2019) conducted a RCT to evaluate the effectiveness of a telephone-delivered, collaborative goal-setting BA intervention in treating depression among people with uncontrolled T2DM. They concluded that the intervention significantly improved depression (Naik et al., 2019). A pilot RCT, conducted by Schneider et al. (2016) combined BA with physical activity for the management of depression in people with T2DM. They reported that the intervention improved depressive symptoms over time (Schneider et al., 2016). Another RCT, conducted by Ali et al. (2020) included BA components in a collaborative care intervention and assessed the effectiveness of the intervention for the management of depression in people with T2DM.

The study reported that compared to usual care, the collaborative care intervention significantly reduced depressive symptoms in people with T2DM (Ali et al., 2020). Araya et al. (2021) developed a digital intervention based on the principles of BA and assessed its effectiveness in managing depression in people with hypertension and/or T2DM. The study concluded that the intervention significantly improved depressive symptoms in people with hypertension and/or T2DM (Araya et al., 2021). To sum up, there is a scarcity of high-quality evidence to draw firm conclusions regarding the effectiveness of BA interventions in people with T2DM as the available literature is in the form of individual clinical trials. However, the limited evidence there is, suggests a role of BA. Moreover, evidence about the effectiveness of BA for treating depression in the general population provides support for its use also in people with depression and T2DM.

1.6 Physical activity

Physical activity is, “any bodily movement produced by skeletal muscles that result in energy expenditure above resting (basal) levels” (Dasso, 2019, Sigal et al., 2018, Caspersen et al., 1985). According to this definition, physical activity encompasses occupational, recreational, and daily activities that require energy consumption. Similarly, physical exercises and sport related activities are also covered under the domain of physical activity. Often the terms exercise and physical activity are used synonymously. However, exercise is a subset of physical activity, and is defined as “planned, structured, repetitive, and purposeful physical activity that is focused on improvement or maintenance of health and/or fitness” (Dasso, 2019, Norton et al., 2010, Caspersen et al., 1985). Physical activity is amongst the ‘behavioural lifestyle interventions’, which have been proposed for the treatment of depression (Lv et al., 2017, Lv et al., 2022).

1.6.1 Methods for measuring physical activity

Physical activity is a broad term and therefore measuring physical activity is a difficult task (Hensen, 2017, Rockette-Wagner et al., 2017). Several subjective and objective tools have been described in the literature to measure physical activity (Hallal et al., 2013, Westerterp, 2009, Westerterp, 2017).

1.6.1.1 Subjective methods

Subjective methods of measuring physical activity include a wide range of self-reported questionnaires and activity diaries.

The use of questionnaires is the most common method of assessing physical activity because they are cost-effective and easily administered (Molina et al., 2017, Dowd et al., 2018, Besson et al., 2010, Ishikawa-Takata et al., 2008). While some of these questionnaires have been shown to have high validity and reliability (Helmerhorst et al., 2012, Sattler et al., 2020), one of their main drawbacks is that they rely on respondents' recall ability, which limits their use in people with cognitive dysfunction (Prince et al., 2020, Forsén et al., 2010). Moreover, the ability of these questionnaires to accurately assess light physical activity and energy expenditure is questionable. In addition, responses to questionnaires can be affected by written language skills and other external factors (Sylvia et al., 2014, Thomas et al., 2015, Hills et al., 2014, Vanhees et al., 2005). The most used questionnaires for measuring physical activity are the Modifiable Activity Questionnaire (Momenan et al., 2012, Tonoli et al., 2013), Past Week Modifiable Activity Questionnaire (Gabriel et al., 2011, Jeansonne, 2014), Recent Physical Activity Questionnaire (Golubic et al., 2014), Global Physical Activity Questionnaire (Armstrong and Bull, 2006, Keating et al., 2019), International Physical Activity Questionnaire (Lee et al., 2011, Craig et al., 2003), Previous Day Physical Activity Recall (Matthews et al., 2013, Matthews et al., 2019), and 7-day Physical Activity Recall (Gross et al., 1990, Zuazagoitia et al., 2014).

Another subjective method for assessing physical activity is the use of self-reported activity diaries. In these diaries, respondents note physical activity in real-time (Prince et al., 2008, Van Der Ploeg et al., 2010). For instance, Bouchard's Physical Activity Record is one such type of diary in which respondents record physical activity at each 15-minute interval for 3 consecutive days (Bouchard et al., 1983). There is a specific scoring method which is used to calculate energy expenditure. While these diaries resolve some of the drawbacks of questionnaires by collecting data in real time, maintaining these diaries is

a tedious task that might limit its use in people with depression and cognitive dysfunction (Rachele et al., 2012, Ling et al., 2011, Lindamer et al., 2008, Gershuny et al., 2020).

1.6.1.2 Objective methods

By general rule, objective measures are assumed to present more precise assessment of physical activity compared to subjective methods. Objective measures are less affected by the subjectivity of participants and eliminate the risk of recall bias, therefore they are almost always preferred over subjective measures (Hills et al., 2014, Dowd et al., 2018, Brown et al., 2020a). The most used objective methods for assessing physical activity include accelerometers, pedometers, and heart rate monitors.

Accelerometers are devices worn on the body, which assess acceleration in real-time. The data obtained from accelerometers allows energy expenditure and patterns of physical activity to be assessed (Corder et al., 2007, Rachele et al., 2012, Chen and David R Bassett, 2005). Accelerometers can assess rate and time spent in various intensities of physical activity; however, accelerometers are costly and require technical skills (Rachele et al., 2012, Sylvia et al., 2014, Pedišić and Bauman, 2015). A pedometer is another device that can objectively measure physical activity by measuring the number of steps a person takes (Bravata et al., 2007, Kang et al., 2009). In contrast to accelerometers, a pedometer is a simple, low-cost device that does not require specialized technical skills; nevertheless, a pedometer is only effective for assessing physical activity that needs forward vertical motion such as running and walking while it is unable to trace horizontal motion such as upper body movements. Moreover, a pedometer cannot record intensity, frequency, and duration of physical activity (Sylvia et al., 2014, Ueno et al., 2013, McNamara et al., 2010).

One of the main indicators of physical activity is heart rate. The main advantage of heart rate monitors is that they can provide real-time information about physical activity parameters such as frequency, duration, and intensity (Sylvia et al., 2014, Trost and O'Neil, 2014, Ainsworth et al., 2015). In contrast to accelerometers and pedometers, heart rate monitors can accurately measure energy expenditure (Crouter et al., 2004, Erdogan

et al., 2010). However, the high cost of heart monitors limits their use in resource limited settings (Butte et al., 2012, Düking et al., 2020).

1.6.2 Physical activity for the management of depression

There are consistent reports in the literature regarding the antidepressant effects of physical activity (Kandola et al., 2019, Firth et al., 2018, Narita et al., 2019). Low levels of physical activity is a major risk factor for depression (Mammen and Faulkner, 2013, Teychenne et al., 2010); physically active people have a lower risk of developing depression compared to their counterparts with low levels of physical activity (Firth et al., 2018). A number of studies have investigated the effectiveness of physical activity for the management of depression and the majority of these have reported potential benefits of physical activity for alleviating depressive symptoms (Schuch et al., 2016, Kvam et al., 2016, Josefsson et al., 2014, Bridle et al., 2012). Knapen et al. (2015) developed evidence-based clinical guidelines in which they stated that for mild to moderate depression, effects of physical activity are equivalent to antidepressants and psychological therapies, while for severe depression, physical activity is an effective complement to conventional treatments (Knapen et al., 2015). While the precise mechanisms through which physical activity exerts antidepressant effects are not clear (Kandola et al., 2019), various physiological and psychological antidepressant mechanisms of physical activity are described in the literature.

1.6.2.1 Physiological antidepressant effects of physical activity

A number of physiological changes that may be relevant to mood are reported to occur due to physical activity (Voss et al., 2013). The most prominent physiological pathways linked with antidepressant effects of physical activity include changes in neuroplasticity, inflammation, oxidative stress, and the neuroendocrine system (Kandola et al., 2019).

Depression can affect brain morphology. A reduction in the volume of the hippocampus and other cortical regions is the most important structural change in the brain due to depression (Schmaal et al., 2016, Lai, 2013, Bora et al., 2012). Depression also affects cerebral blood flow and can impair many cellular mechanisms of neuroplasticity

(Molendijk et al., 2014, Cooper et al., 2020, Pittenger and Duman, 2008). There is a growing body of literature that suggests physical activity not only enhances neuroplastic mechanisms and cerebral blood flow, but can also increase the volume of the hippocampus and other cortical regions (Firth et al., 2018, Zheng et al., 2019, Gujral et al., 2017, Maass et al., 2015). Thus, enhancing the mechanisms of neuroplasticity through physical activity may counter many structural abnormalities associated with depression (Kandola et al., 2019).

Inflammation has an important role in the pathophysiology of depression (Köhler et al., 2017, Valkanova et al., 2013, Raison et al., 2006). Evidence suggests that physical activity has anti-inflammatory effects and limits the level of inflammatory factors in the circulatory system (Lin et al., 2015, Eyre et al., 2013). The anti-inflammatory effect of physical activity can be explained by the fact that exercise can result in the production of an anti-inflammatory cytokine called interleukin-10 (Cabral-Santos et al., 2019) (Pedersen and Fischer, 2007, Kandola et al., 2019). Another important physiological pathway by which physical activity might exert its antidepressant effects is through the production of antioxidant enzymes and countering the effects of oxidative stress on the brain (Schuch et al., 2014, Radak et al., 2008, de Sousa et al., 2017). Several studies have reported an association between depression and oxidative stress (Palta et al., 2014, Moylan et al., 2014). The brain is highly susceptible to oxidative stress due to its high metabolic rate and low level of antioxidants (Maes, 2011). Although human studies in this area are limited, a study by Marosi et al. (2012) reported that physical activity can significantly reduce oxidative stress in the hippocampus of rats (Marosi et al., 2012). The neuroendocrine system also plays an important role in regulating physiological and psychological responses to stress (Ogłodek et al., 2014, Chrousos, 2009). Available evidence suggests that physical activity has a positive influence on the neuroendocrine system which in turn helps in reducing depressive symptoms (Heijnen et al., 2016, Kandola et al., 2019, Foley et al., 2008).

1.6.2.2 Psychological antidepressant effects of physical activity

In addition to physiological benefits, physical activity has numerous psychological effects that can directly or indirectly help in managing depression. These include improved self-esteem, social support, and self-efficacy (Kandola et al., 2019).

Self-esteem has a bidirectional association with depression which means that low self-esteem can lead to depression while depression can further lower self-esteem (Keane and Loades, 2017, Orth et al., 2008). Previous research reported that self-esteem scores have a positive correlation with physical activity (Sani et al., 2016, Feuerhahn et al., 2014, Legrand, 2014, Özdemir et al., 2010). Some researchers suggest that the main driving factor for the increase in self-esteem that results from engagement in physical activity might be due to changes in body composition, such as increase in lean body mass (Annesi and Porter, 2015, Slentz et al., 2004). However, several studies have reported that the positive effects of physical activity on self-esteem can be observed even without changes in body composition (Campbell and Hausenblas, 2009, Anderson et al., 2006).

Lack of social support can lead to depression and vice versa (Väänänen et al., 2014, Ozbay et al., 2007). Physical activity, especially interactive types of exercise such as sports, can increase social support by increasing socialization and interaction (Scarapicchia et al., 2017, Hallgren et al., 2017, Sabiston et al., 2016). In addition to self-esteem and social support, another psychological mechanism through which physical activity can help in managing depression is self-efficacy. Low levels of self-efficacy can influence a person's ability to cope with emotional challenges, thus it can be a causative factor for the development of depression. People with low self-efficacy have a greater risk of depression compared to their counterparts with high levels of self-efficacy (Taneichi et al., 2013, Tak et al., 2017, Tahmassian and Moghadam, 2011). Research suggests that physical activity can enhance self-efficacy by improving physical abilities and skills (Higgins et al., 2014, Haller et al., 2018, White et al., 2009, Wipfli et al., 2011).

1.6.2.3 ‘Dose’ of physical activity for the management of depression

Due to consistent evidence supporting the positive effects of physical activity in depression (Narita et al., 2019, Stanton and Happell, 2013), current research is less focused on determining the effectiveness of physical activity. Instead, the main focus of contemporary research is to establish the optimal dose and type of physical activity for the management of depression (Nyström et al., 2015, Harvey et al., 2018, Cooney et al., 2014). There are significant inconsistencies in the literature regarding the optimal dose of physical activity recommended for managing depression (Robertson et al., 2012, Mead et al., 2008, Legrand and Heuze, 2007, Dunn et al., 2005, Schuch et al., 2016, Birkeland et al., 2009, Nyström et al., 2015, Helgadóttir et al., 2016, Perraton et al., 2010, Stanton and Reaburn, 2014).

Nyström et al. (2015) recommended that rather than focusing on the dose of physical activity, attention must be focused on motivating people with depression to engage in any physical activity. They added that the dose of physical activity is of secondary importance and therefore should be decided on a case-by-case basis (Nyström et al., 2015). The guidance from Nyström et al. (2015) is based on two meta-analyses which suggested that there is no direct association of energy expenditure with the alleviation of depression (Robertson et al., 2012, Rethorst et al., 2009). Evidence suggests that it is not the dose that determines the effectiveness of physical activity in treating depression, but rather other mechanisms such as breaking the pattern of sustained behaviours via exercise and other psychological and contextual mechanisms (Nyström et al., 2015, Helgadóttir et al., 2016, Danielsson et al., 2013, Nyström, 2018). This is supported by the growing body of evidence that shows that low-level physical activity is almost equally effective in reducing symptoms of depression as vigorous physical activity (Rethorst et al., 2009, Robertson et al., 2012, Nyström et al., 2017).

Research has shown that the intensity of physical activity interventions for the management of depression should be adjusted according to the individual preferences (Stanton and Reaburn, 2014). Studies reported that individuals who received personalised physical activity had significantly greater reductions in depressive

symptoms compared to individuals who performed pre-determined intensity of physical activity (Callaghan et al., 2011, Robertson et al., 2012). A qualitative study conducted by Searle et al. (2011) reported that people with depression prefer physical activities that are adapted according to their individual needs and preferences (Searle et al., 2011). As people with depression tend to be more sedentary and experience barriers to physical activity, Danielsson et al. (2013) suggested that physical activity interventions for people with depression should start with lower-intensity exercises and progress according to their individual preferences (Danielsson et al., 2013). The available evidence suggests that the dose of physical activity for people with depression needs to be individually customized based on their preferences, severity of depressive symptoms, prior experiences of physical activity and their physical and mental health status (Nyström et al., 2015, Nyström et al., 2017, Stanton and Reaburn, 2014).

1.6.2.4 Types of physical activity for the management of depression

Physical activity can be categorized into two types; aerobic and anaerobic (Beyer et al., 2020). The word “Aerobic” means “with oxygen” because oxygen is the main source of energy during aerobic physical activity. Aerobic physical activity increases a person's heart and breathing rate over a sustained period and therefore improves endurance and cardiorespiratory functions. Examples of aerobic physical activity include walking, jogging, running, swimming, and cycling. The word “anaerobic” means “without oxygen” because the body relies on stored energy sources, rather than oxygen, during anaerobic physical activity. Anaerobic physical activity involves intense, powerful movements for shorter period and is used to improve strength and power. Examples of anaerobic physical activity include weightlifting, sprinting and jump squats (Nugroho et al., 2018, Chamari and Padulo, 2015, Voelcker-Rehage and Niemann, 2013, Edwardson and Gorely, 2010).

Although both aerobic and anaerobic physical activity have their own benefits, aerobic exercises are the most commonly recommended type of physical activity for people with depression (Nyström et al., 2015, Pascoe and Parker, 2019, Wu et al., 2017, Schuch et al., 2016, Danielsson et al., 2013). While most research focuses on aerobic exercise,

many studies have reported that both aerobic and anaerobic forms of physical activity are effective in alleviating depressive symptoms (Stanton and Happell, 2013, Hallgren et al., 2017, Danielsson et al., 2013, Nyström et al., 2015). Some studies suggests that the type of physical activity prescribed should be based on availability of resources, social support and individuals' and their carers' preferences (Stanton et al., 2013, Stanton and Happell, 2013, Hidalgo, 2019).

Physical activity can also be classified into supervised and unsupervised physical activity (Gajanand et al., 2020, Creasy et al., 2017). The majority of studies which assess the effects of physical activity in the management of depression use a supervised type of physical activity (Stanton and Reaburn, 2014, Perraton et al., 2010, Carek et al., 2011, Romain et al., 2020, Rethorst et al., 2009). Supervised activity may be beneficial as people with depression are less likely to perform physical activity without supervision (Nyström, 2018, Romain et al., 2020, Gajanand et al., 2020). Supervised physical activity not only helps motivate people but also guarantees that exercises are performed as intended. Moreover, it might also help in reducing the risk of injuries associated with physical activity (Nyström, 2018, Nyström et al., 2015).

Supervision is also possible through electronic devices such as a pedometer, electronic diaries/watches, mobile applications, and other electronic gadgets (Franssen et al., 2020, Mishra et al., 2014, Degroote et al., 2018). Although there is limited evidence regarding the effectiveness of these electronic devices in supervising physical activity in people with depression, they have been shown to have potential to supervise physical activity reliably in the general population (Lynch et al., 2018, Franssen et al., 2020, Valentiner et al., 2017, Henriksen et al., 2020). Research suggests that the most important function of supervision is to provide motivation. Electronic devices can fulfil this role, providing monitoring and feedback, and could, therefore, be used for supervision of physical activity (Nyström et al., 2015, Danielsson et al., 2013, Gupta et al., 2018, Dorri et al., 2020, Degroote et al., 2018). The mode and extent of supervision do not appear to determine the effectiveness of physical activity for the management of depression (Nyström et al., 2015). Studies have found that while supervision may be needed for physical activity, full-

time supervision is not essential because full-time supervised and part-time supervised physical activity have no significant differences in treatment outcomes (Perraton et al., 2010, Nyström, 2018, Nyström et al., 2015, Nyström et al., 2017). In a nutshell, the use of electronic devices is an alternative option for supervising physical activity in people with depression; however, it is still relatively unexplored.

1.6.3 Physical activity for the management of type 2 diabetes mellitus

The benefits of physical activity for the prevention and management of T2DM are extensively described in the literature. High-quality evidence shows that moderate to high levels of physical activity considerably reduce morbidity and mortality in people with T2DM (Sigal et al., 2018, Kirwan et al., 2017, Zanuso et al., 2010). There are numerous health benefits of physical activity; one of the most important benefits specifically for people with T2DM is that it can help in controlling blood glucose levels.

Glycaemic control is the cornerstone of T2DM care because poor glycaemic control is considered a strong predictor of developing complications (Kirwan et al., 2017). Physical activity alone or in conjunction with other interventions can effectively improve glycaemic control in people with T2DM (Liubaoerjijin et al., 2016, Mann et al., 2014, Umpierre et al., 2013, Umpierre et al., 2011, Zanuso et al., 2010, Boulé et al., 2001). A systematic review and meta-analysis assessed the effects of structured exercises and general physical activity in improving glycaemic control in people with T2DM. The review reported that most clinical trials demonstrated a decrease in glycated haemoglobin (HbA1C) after a physical activity intervention. The review concluded that physical activity is effective in achieving glycaemic control in people with T2DM (Shah et al., 2021).

The underlying mechanisms through which physical activity helps in improving glycaemic control are complex; however, the pathophysiology of T2DM can assist in understanding the fundamental processes. Insulin receptors and glucose transporters are impaired in people with T2DM, while physical activity enhances peripheral insulin sensitivity and insulin binding and decreases insulin resistance, which may result in improved glycaemic control (van Dijk and van Loon, 2015, Sigal et al., 2018). Besides glycaemic control, other

commonly reported health benefits of physical activity in people with T2DM include improved cardiorespiratory fitness, lipid profile, body mass index, and blood pressure. Moreover, physical activity also enhances quality of life and psychological well-being in people with T2DM (Shah et al., 2021, Sigal et al., 2018).

1.6.4 Physical activity for the management of depression in people with type 2 diabetes mellitus

The antidepressant effects of physical activity are not limited to only the general population, as physical activity can be used to reduce symptoms of depression in people with co-morbid somatic illnesses (Narita et al., 2019, Mašanović et al., 2018, Wu et al., 2017). Physical activity may have two-fold benefits for people experiencing both mental and physical health problems. First, it could reduce depressive symptoms through biological and psychosocial pathways and second, it may improve physical health either by improving the disease condition itself or by preventing secondary complications associated with it (Blumenthal et al., 2012, Knapen et al., 2015). The literature suggests that the positive effects of physical activity for managing depressive symptoms are also applicable to people with depression and T2DM (Lysy et al., 2008, Narita et al., 2019). Narita et al. (2019) conducted a systematic review and meta-analysis, which evaluated the effectiveness of physical activity interventions for managing depression in people with DM. The review concluded that compared to usual care, physical activity significantly reduced depressive symptoms in people with DM (Narita et al., 2019). Physical activity in people with T2DM might stimulate additional antidepressant mechanisms to manage depression. For example, research suggests that abnormal blood glucose levels can play a role in the emergence of depression (Ravona-Springer et al., 2017, Hamer et al., 2011, Maraldi et al., 2007) while it is well-established that physical activity can help in improving blood glucose levels. Consequently, in people with T2DM, physical activity may not only exerts its antidepressant effects through psychological pathways but also by improving blood glucose levels and general physical health (Green et al., 2011).

1.6.5 Physical activity in women

There are consistent reports in the literature that women are physically less active than men. Globally, the prevalence of physical inactivity among women is 31.7% while its prevalence among men is 23.4% (Guthold et al., 2018, Cla, 2018). The disparity in physical activity between boys and girls starts at a young age. Studies have reported that girls aged 3 to 11 years show less interest in physical activity compared to boys of the same age (Cla, 2018, O’Keefe, 2019), and this gender gap in physical activity is reported for all age groups (Tcymbal et al., 2020, Van Uffelen et al., 2017, Guthold et al., 2022).

Several barriers have been reported that may account for the low levels of physical activity among women. Individual level factors including shyness to perform physical activity in front of others and lack of time are the most commonly reported barriers to participation of women in physical activity (Tovar et al., 2018, Sabiston et al., 2019). Self-consciousness regarding body image, size and shape often hinders women from participating in physical activity (Sabiston et al., 2019, Harrison et al., 2018). Moreover, due to caregiving responsibilities for family members, women often have limited time for physical activity (Sun et al., 2017, Ahmadi et al., 2017). Studies also show that the presence of children is a barrier to women’s engagement in physical activity (Hull et al., 2010, Gropper et al., 2020).

In some parts of the world, sociocultural norms do not support the engagement of women in outdoor physical activity, until and unless, there are separate physical activity spaces for women (Almutari and Orji, 2021, Sharara et al., 2018). These separate physical activity spaces such as public parks, gyms, and sports facilities designated for women are often not available, particularly in LMICs, therefore, women remain deprived of opportunities to perform outdoor physical activity (Aljayyousi et al., 2019, Laar et al., 2019, Donnelly et al., 2018).

The disparity in women engaging in physical activity is particularly important as they are at higher risk of developing depression (Ferri et al., 2023), and complications associated with T2DM (Norhammar and Schenck-Gustafsson, 2013). To avoid further increasing this

disparity, interventions involving physical activity should specifically address barriers faced by women in taking part in physical activity.

1.7 Combining Behavioural Activation and physical activity for people with depression and type 2 diabetes mellitus

Several lines of evidence support the effectiveness of psychological interventions for managing depression in people with T2DM. Although the literature on BA is limited, the available evidence supports the use of BA for the management of depression in people with T2DM (Naik et al., 2019, Schneider et al., 2016). However, psychological therapies including BA have limited effectiveness in improving glycaemic control in people with T2DM (Winkley et al., 2020, Naik et al., 2019, Baumeister et al., 2014).

Conversely, physical activity is effective for improving glycaemic control and it is also effective in reducing the symptoms of depression. However, one problem with traditional physical activity approaches is maintaining people's interest and adherence in performing physical activities (Bullard et al., 2019). As physical activity can be perceived as a tedious task, people with depression and T2DM may be less likely to adhere to physical activity protocols. Lack of interest and non-adherence can impair the potential effectiveness of physical activity (Settineri et al., 2019).

The literature suggests that the use of rewarding activities can improve people's motivation and adherence to physical activity (Bullard et al., 2019). The main concept behind the treatment approach in BA is to increase people's engagement with positively rewarding activities (Forbes, 2020). While increasing daily activities is the goal of BA, it does not specifically employ strategies to promote physical activity. With a slight change in the emphasis, however, there is a possibility to focus BA on physical activity. This can be achieved by selective reinforcement of activities that demand high energy expenditure (Pentecost et al., 2015, Michie et al., 2009). Tailoring BA to focus on physical activity might reinforce the intervention effect, and thus integrating BA with physical activity interventions may be more effective, engaging, attractive, practical, and enjoyable than

either treatment alone. Previous studies have reported that combining physical activity with psychological therapies, such as CBT, is effective in managing depression in people with T2DM (Piette et al., 2011, de Groot et al., 2012).

Even though physical activity and BA share the common goal of reactivating the individual (Soucy et al., 2017, Euteneuer et al., 2017, Duncan et al., 2020, Szuhany and Otto, 2020, Pentecost et al., 2015, Farrand et al., 2014), few studies have evaluated the combined effects of BA and physical activity in the management of depression (Schneider et al., 2016, Pentecost et al., 2015). A pilot RCT evaluated the feasibility of integrating BA with exercise for people with depression and T2DM (Schneider et al., 2011, Schneider et al., 2016) and reported that it was a feasible and acceptable intervention. Furthermore, participants who received the integrated BA and exercise intervention reported greater enjoyment of exercise. However, its efficacy and effectiveness for the treatment in depression have not been evaluated.

1.7.1 Combining Behavioural Activation and physical activity for women with depression and type 2 diabetes mellitus in Pakistan

The literature suggests that 27% to 80% of women in Pakistan do not perform the recommended level of physical activity (Hoodbhoy et al., 2018, Samir et al., 2011, Pengpid et al., 2015, Memon et al., 2018, Guthold et al., 2008, Mawani, 2017). While the exact estimates regarding physical inactivity among women with depression and T2DM living in Pakistan are not available, it is likely that physical inactivity is significantly higher in this population compared to that observed in women without depression and T2DM.

Besides individual factors, low levels of physical activity among women are linked to various sociocultural, religious, and infrastructural factors that make promoting physical activity in women with depression and T2DM challenging. Despite ongoing research and strategies to tackle non-communicable diseases, such as T2DM, there is still a significant knowledge gap regarding how to promote physical activity among women in Pakistan. Women, particularly in rural areas, are frequently confined to their homes, and due to differing gender roles and stereotypes associated with femininity, promotion of physical

activity among women is a complex task. However, BA may offer a chance to encourage women with depression and T2DM, who may be less active than the general population, to engage in physical activity. By focusing on women's routine, pleasurable, and necessary activities, it might be possible to increase physical activity levels among women with depression and T2DM, despite the challenges mentioned above. The approach to focus BA on physical activity is important as it may have the potential to address the current disparity in women engaging in physical activity and to prevent further increasing this inequality.

Chapter 2: Aims and objectives

2.1 Aim

The literature presented in the previous chapter showed that an integrated BA and physical activity intervention may have the potential to tackle depression and T2DM multimorbidity. However, there is limited literature available on this approach of integrating BA and physical activity in LMICs. Therefore, the overall aim of this thesis was to adapt an evidence-based integrated BA and physical activity intervention for people with depression and T2DM multimorbidity living in Pakistan.

2.2 Objectives

There were three specific objectives;

- To synthesise the global evidence on the effectiveness of physical activity interventions (alone or in combination with other types of intervention) for improving depressive symptoms and glycaemic control in people with T2DM
- To explore the facilitators and barriers to the uptake of physical activity in people with depression and T2DM in Pakistan
- To adapt an integrated BA and physical activity intervention specifically for women with depression and T2DM in Pakistan

2.2.1 Objective 1: Synthesising the evidence on effectiveness of physical activity

In Chapter 1, a general overview of the use of physical activity in people with depression and T2DM was presented. However, there was a scarcity of high-quality evidence on which to base conclusions regarding the effects of physical activity in reducing depressive symptoms in people with T2DM. Moreover, there was limited evidence regarding the effectiveness of physical activity in achieving glycaemic control in people with depressive symptoms and T2DM. Therefore, the first objective of this thesis was to comprehensively and systematically synthesise the evidence on the effectiveness of physical activity in improving depressive symptoms and glycaemic control in people with T2DM. To achieve this objective, a systematic review and meta-analysis with the following objective was conducted;

- To assess the effects of physical activity compared with usual care or no intervention on depressive symptoms and glycaemic control in people with T2DM

In addition to assessing the effectiveness of physical activity, the purpose of conducting this systematic review was to understand the different types of physical activity interventions used in people with depressive symptoms and T2DM. Another purpose was to know the effects of physical activity applied alone or in combination with other interventions (particularly psychotherapies) in this population.

2.2.2 Objective 2: Assessing facilitators and barriers to uptake of physical activity

As the aim of the thesis was to adapt an integrated BA and physical activity intervention for people with depression and T2DM living in Pakistan, there was a need to first identify the specific enablers and constraints to physical activity for people with these co-existing conditions in Pakistan. Therefore, the second objective was to assess facilitators and barriers to uptake of physical activity in people with depression and T2DM in Pakistan. To achieve this objective, a qualitative study with the following objective was conducted;

- To explore experiences, perceptions, and attitudes of people with depression and T2DM, their carers, and healthcare staff about supporting physical activity in people with depression and T2DM in Pakistan.

2.2.3 Objective 3: Adapting an integrated Behavioural Activation and physical activity intervention specifically for women with depression and T2DM in Pakistan

While the original aim was to adapt an integrated BA and physical activity intervention for both men and women, the findings from the systematic review and qualitative study highlighted the need to prioritise a culturally appropriate integrated BA and physical activity intervention specifically for women with depression and T2DM. Therefore, the third objective was:

- To adapt an integrated BA and physical activity intervention for women with depression and T2DM living in Pakistan.

Part II: Methods and Results

In this part of the thesis, I present the three studies I conducted during my PhD:

- Effectiveness of physical activity in managing co-morbid depression in adults with type 2 diabetes mellitus: A systematic review and meta-analysis
- Barriers & facilitators to physical activity in people with depression and type 2 diabetes mellitus in Pakistan: A qualitative study to explore perspectives of patient participants, carers and healthcare staff
- Adaptation of an integrated Behavioural Activation and physical activity intervention for women with depression and type 2 diabetes mellitus in Pakistan

Part II consists of three chapters and at the start of each chapter, I present the research study followed by a short discussion of my rationale for the chosen methods and additional reflections on the strengths and limitations of my approach.

I adopted a pragmatic paradigm for the research. The pragmatic paradigm of research is conceptually flexible and thus enables researchers to conduct research in novel and dynamic ways (Allemang et al., 2022). The philosophical tenets of the pragmatic paradigm view truth as “tentative” which means that realities can change over time (Snelgrove, 2022). Pragmatic research avoids abstract, set principles, and encourages the use of materials and methods for the collection and analysis of data that are most likely to shed light on the research question under consideration (Ataro, 2020). Other research paradigms such as positivism and interpretivism are committed to one system of philosophy. For example, positivism assumes that there is one objective reality and therefore positivists generally prefer quantitative methods in their research. On the other hand, interpretivism assume that people experience and understand reality in different ways, therefore interpretivist generally prefer qualitative methods (Alharahsheh and Pius, 2020, Clarke, 2009). Contrary to these, pragmatism assume that there can be single or multiple realities. Pragmatism is not committed to any one system of philosophy and pragmatists often prefer mixed methods or a mix of methods for research work (Kaushik and Walsh, 2019, Allemang et al., 2022). My research involved both quantitative (meta-analysis) and qualitative work (to understand the changing and varied realities that underpin people experiences), therefore a pragmatic paradigm was more appropriate.

Chapter 3: A systematic review and meta-analysis to assess effects of physical activity on depressive symptoms in people with type 2 diabetes mellitus

This study has been published as a review article:

Arsh, A., Afaq, S., Carswell, C., Bhatti, M. M., Ullah, I. & Siddiqi, N. (2023). Effectiveness of physical activity in managing co-morbid depression in adults with type 2 diabetes mellitus: A systematic review and meta-analysis. Journal of Affective Disorders, 329, 448-459.

Role of each author is described in the preface (Page 15-17).

This chapter provides a review of studies that assessed the effectiveness of physical activity alone or in combination with other interventions for the management of depressive symptoms in people with T2DM. The review article published in the Journal of Affective Disorders (abstract, introduction, methods, results, discussion, and conclusion) is presented in sections 3.1 to 3.6. Additional considerations (expanding on methodological and ethical considerations) related to the systematic review and meta-analysis are presented in section 3.7 and 3.8. At the end of the chapter, a way forward (section 3.9) is presented that links the findings of this chapter with the next chapter of the thesis.

Effectiveness of physical activity in managing co-morbid depression in adults with type 2 diabetes mellitus: A systematic review and meta-analysis

3.1 Abstract

Background: Physical activity may be effective in alleviating depressive symptoms and improving glycaemic control; however, evidence to guide practice is limited. The current review was conducted to assess the effects of physical activity on depression and glycaemic control in people with T2DM.

Methods: Randomized controlled clinical trials, from the earliest record to October 2021, which recruited adults with the diagnosis of T2DM and compared physical activity with no interventions or usual care for the management of depression were included. The outcomes were change in depression severity and glycaemic control.

Results: In 17 trials, including 1362 participants, physical activity was effective in reducing the severity of depressive symptoms (SMD=-0.57; 95%CI=-0.80, -0.34). However, physical activity did not have a significant effect in improving markers of glycaemic control (SMD=-0.18; 95%CI=-0.46,0.10).

Conclusion: Physical activity can effectively reduce the severity of depressive symptoms, nonetheless, it appears that physical activity is not significantly effective in improving glycaemic control in adults who have both T2DM and depressive symptoms. The latter finding is surprising, however, given the limited evidence on which this is based, future research on the effectiveness of physical activity for depression in this population should include high quality trials with glycaemic control as an outcome.

3.2 Introduction

The many challenges of living with T2DM may negatively affect mental health and therefore individuals with T2DM are at higher risk of developing depression (Pinchevsky et al., 2020, Davies, 2019, Zhuang et al., 2017, Chireh et al., 2019, Elamoshy et al., 2018, Li et al., 2019). In individuals with T2DM, depression worsens glycaemic control and thus increases the risk of developing secondary complications (Hermanns et al., 2013, Nouwen et al., 2019).

Treatment of depression in people with T2DM is much more challenging compared to the general population as clinicians have to consider blood glucose levels and other diabetes-specific parameters, which may be adversely affected by psychotropic medication (Davies, 2019, Owens-Gary et al., 2019, Brandt et al., 2019). Moreover, the motivational deficits seen in depression may negatively impact T2DM treatment adherence and self-management activities such as diet and physical activity. Therefore, due to the complex interaction between depression and T2DM, treatment needs to consider both psychological well-being and glycaemic control (Davies, 2019, Perrin et al., 2019, Owens-Gary et al., 2019, Petrak and Herpertz, 2009, Petrak et al., 2015, Kulzer et al., 2013). A wide range of antidepressant medications and psychotherapeutic approaches are available to manage depression. Although it is commonly thought that improvement in mental health may also help in achieving glycaemic control in people with depression and T2DM, studies have reported that antidepressants and psychotherapy have limited effects on glycaemic control (Wang et al., 2017, Baumeister et al., 2014, Chew et al., 2017, Harkness et al., 2010).

In contrast to these approaches, physical activity might not only be effective in alleviating depressive symptoms but may also assist in achieving glycaemic control in people with T2DM (Kandola et al., 2019, Firth et al., 2018, Narita et al., 2019). Antidepressant effects of physical activity have been demonstrated both in the general population and in people with co-morbid somatic illnesses such as cardiovascular diseases and diabetes (Narita et al., 2019, Mašanović et al., 2018, Wu et al., 2017). Physical activity may have two-fold

benefits for populations with mental and physical health multimorbidity: (i) it may reduce depressive symptoms through biological and psychosocial pathways and (ii) improve physical health either by improving the multimorbidity itself or by preventing secondary complications associated with it (Blumenthal et al., 2012, Knapen et al., 2015).

The available literature suggests that the positive effects of physical activity for managing depression are also applicable to people with depression and T2DM (Lysy et al., 2008, Schneider et al., 2016). Besides the general antidepressant mechanisms, physical activity in people with T2DM might stimulate additional antidepressant mechanisms to manage depression. For example, research suggests that poor glycaemic control can contribute to the emergence of depression while several lines of evidence suggest that physical activity can help in improving glycaemic control and quality of life in people with T2DM (Ravona-Springer et al., 2017, Hamer et al., 2011, Maraldi et al., 2007). Consequently, it can be hypothesized that in people with T2DM, physical activity not only exerts its antidepressant mechanisms by improving psychological status but also by improving physical health (Green et al., 2011).

Despite its numerous health benefits, there is a scarcity of high-quality evidence regarding the effectiveness of physical activity in managing depression among adults with T2DM. One systematic review assessed the effect of physical activity on managing depression in people with diabetes (Narita et al., 2019). However, it included people with both type 1 and type 2 diabetes and did not perform a subgroup analysis to report effects of physical activity in managing depression specifically in people with T2DM. Moreover, it only assessed effects of physical activity on depressive symptoms and did not evaluate the impact on glycaemic control. Moreover, it included both participants with and without a diagnosis of depression and did not differentiate between these groups. Furthermore, there were a limited number (n=3) of databases searched and the review was limited to English language articles. Therefore, the current study aimed to comprehensively summarise the evidence, using rigorous systematic review methods, for the effects of physical activity in people with depression and T2DM.

3.2.1 Objective

The objective of the review was to assess the effects of physical activity compared with usual care or no intervention on depressive symptoms and glycaemic control in people with T2DM.

3.3 Methods

3.3.1 Protocol and registration

The protocol for this systematic review and meta-analysis was registered with PROSPERO (www.crd.york.ac.uk/PROSPERO) under the registration number CRD42021273032.

3.3.2 Eligibility criteria

3.3.2.1 Study Designs

Individual or cluster RCTs that compared physical activity with no intervention or usual care for the management of depression in subjects with T2DM were included. Studies that compared two forms of physical activity without another control group were excluded.

3.3.2.2 Participants

Clinical trials were included that recruited adults (18 years and above) with T2DM, irrespective of how the diagnosis of T2DM had been ascertained. Clinical diagnosis of depression was not mandatory for inclusion, however, individuals with T2DM who underwent an evaluation for depressive symptoms at baseline and follow-up, were included.

3.3.2.3 Intervention

Any form of physical activity (aerobic/anaerobic, supervised/unsupervised) alone or in combination with any other treatment modality used for managing depression was included. Physical activity was defined as “movement produced by skeletal muscle that leads to energy expenditure above resting levels” (Ainsworth et al., 2011). There was no restriction on the duration of each session or number of total sessions.

3.3.2.4 Comparator

The participants in the control group received either usual care or no intervention. Usual care consisted of leaflets, brief advice, or educational sessions.

3.3.2.5 Outcomes

The primary outcome was the change in depression severity from baseline to post-intervention and last available follow-up measured on validated measures. Secondary outcomes included improvements in glycaemic control from baseline to post-intervention and last available follow-up measured through Haemoglobin A1c (HbA1c).

3.3.3 Information sources

MEDLINE (Ovid) (1946 to October 06, 2021), EMBASE (Ovid) (1974 to 2021 October 06, 2021), AMED (Ovid) (1985 to October 2021), CINAHL (EBSCO) (1982 to October 2021), PsycINFO (Ovid) (1806 to September Week 4 2021) and Health Management Information Consortium (Ovid) (1979 to July 2021) were searched. Reference lists of the included articles and relevant systematic reviews were also checked to find additional articles.

3.3.4 Search strategy

The search strategy for the various databases is provided in Appendix 1.

3.3.5 Study selection

Search results were imported into Covidence (www.covidence.org). After removal of duplicates, screening was performed in two stages; during the first stage, two independent reviewers (AA and IU) screened the titles and abstracts of the studies, while during the second stage, the same reviewers independently performed full-text screening. Based on full-text screening, studies were divided into relevant, irrelevant, and unsure categories. Studies in the “irrelevant” category were excluded and reasons for exclusion were documented, while studies in the “relevant” group were included. Studies in the “unsure” category were discussed further at a consensus meeting with the two independent reviewers. Disagreements between the two reviewers (AA and IU) were

resolved by discussion and if needed, a third reviewer (MM) was contacted to make the final decision on inclusion/exclusion.

3.3.6 Data collection process

The data extraction form was designed and piloted before data extraction. Two independent reviewers (AA, IU) evaluated each included study and extracted data. All discrepancies were resolved by discussion and if needed, a third reviewer (MM) resolved disagreements.

3.3.7 Data items

The information, extracted from the included studies was:

- Study information such as first author name, year of publication and country name.
- Participant information such as sample size and participants in each group, demographic information (mean age, gender) and clinical characteristics.
- Information about physical activity intervention; type and intensity of physical activity, modes of delivery, settings, procedures, and processes involved, duration of each session, number of total sessions and follow-up duration.
- Information about control group(s).
- Information about any co-interventions used along with physical activity.
- Information about outcome measures used in the study and baseline, post-intervention, and follow-up scores (if available) of outcome measures used for assessing depressive symptoms and glycaemic control.

3.3.8 Risk of bias assessment

Two independent reviewers (AA, IU) evaluated the methodological quality of each included study according to the Cochrane Risk of Bias Tool version 1. Methodological quality assessments were checked for agreement between AA and IU and any discrepancy was resolved by discussion. In cases where the discrepancy could not be resolved, a third reviewer (MM) made the final decision.

3.3.9 Data synthesis

Meta-analyses were conducted using random-effects models in RevMan 5.4.1 software. The I^2 statistic was used to report heterogeneity in the included studies. Funnel plots were used to assess and report publication bias.

3.3.10 Subgroups analysis

Subgroup analyses were conducted to assess whether findings varied according to gender, economic status of the country in which study was conducted (high-income countries vs. LMICs), diagnosis of depression (diagnosed vs. undiagnosed depression) and quality of the studies. The World Bank list of high-income countries and LMICs was used to classify countries on economic status.

3.4 Results

3.4.1 Study selection

The literature search identified 4704 records. Two records were identified through additional sources. Following removal of duplicates, 3567 articles remained. Titles and abstracts of these articles were screened, and 3442 were excluded. Full texts of the remaining 125 records were studied and 107 records were excluded, documenting reasons. Finally, 18 studies meeting eligibility criteria were included in the narrative synthesis, of which 17 studies were included in meta-analyses (Figure 1).

3.4.2 Study characteristics

Most of the included studies ($n=11$) were conducted in high-income countries while 7 studies were conducted in LMICs. Two were conducted between the year 2001 to 2010 and 14 between 2011 to 2020. The remaining 2 studies were conducted in 2021 (Table 1).

Most RCTs ($n=15$) had two study arms. Two studies had three arms, however, we considered only two arms (physical activity and usual care) from these two studies in the analysis (Vucic Lovrencic et al., 2015, Putiri et al., 2012). One study had four arms (CBT,

exercise, CBT+exercise, usual care), from which we considered three arms (exercise, CBT+exercise, usual care) in the analysis (de Groot et al., 2019). For the latter study, we combined data from two intervention groups (exercise and CBT+exercise) for conducting meta-analysis.

3.4.3 Participants

The 18 studies included 1428 participants (746 in the experimental group and 682 in the control group). Most (n=13) studies included both male and female participants, while 3 studies included only male participants (Saiiari et al., 2011, Sardar et al., 2014, Gilani and Feizabad, 2019), and 2 studies included only female participants (Schneider et al., 2016, Yucel and Uysal, 2016). Participants in 14 studies had a mean age greater than 50 years, while participants in 4 studies had a mean age less than 50 years (Gilani and Feizabad, 2019, Osama and Shehab, 2015, Sardar et al., 2014, Saiiari et al., 2011).

The majority of the studies (n=12) did not specify a clinical diagnosis or severity of depression of the included participants. Of the remaining 6 studies, two studies included participants with major depressive disorder diagnosed based on the Structured Clinical Interview for DSM-IV disorders (Schneider et al., 2016, de Groot et al., 2019), one study included participants with Beck Depression Inventory scores (BDI) ≥ 14 (Piette et al., 2011), one study included participants with BDI scores > 18 (Saiiari et al., 2011), one study included subjects with at least one depressive symptom on Patient Health Questionnaire-2 (PHQ-2) (Vucic Lovrencic et al., 2015), while one study included subjects with mild to moderate depression, but did not reported the method of diagnosing mild to moderate depression (Abdelbasset et al., 2020).

3.4.4 Intervention

Thirteen studies used a physical activity intervention alone. Of the remaining 5 studies, 2 combined physical activity with CBT (Piette et al., 2011, de Groot et al., 2019), one study combined it with BA (Schneider et al., 2016), one study combined it with dietary measures (Osama and Shehab, 2015), while one study combined physical activity with cognitive training (Kraiwong et al., 2021). Eleven studies used aerobic exercises as an intervention,

2 studies used resistance exercises (Lincoln et al., 2011, Putiri et al., 2012) while 5 studies used mixed types of exercises as the intervention (Martinez-Velilla et al., 2021, Kraiwong et al., 2021, Duruturk and Ozkoslu, 2019, Vucic Lovrencic et al., 2015, Aylin et al., 2009).

Four studies provided purely supervised physical activity (Lincoln et al., 2011, Duruturk and Ozkoslu, 2019, Gilani and Feizabad, 2019, Kraiwong et al., 2021), 3 studies provided purely unsupervised physical activity (Kempf and Martin, 2013, Piette et al., 2011), 3 studies provided mixed supervised and unsupervised physical activity (Aylin et al., 2009, Martinez-Velilla et al., 2021, Putiri et al., 2012), while the remaining 8 studies did not provided explicit information about supervision. A large proportion (n=13) of studies applied low to moderate-intensity exercise (McKay et al., 2001, Saiiari et al., 2011, Osama and Shehab, 2015, Sardar et al., 2014, de Groot et al., 2019, Kraiwong et al., 2021, Schneider et al., 2016, Kempf and Martin, 2013, Vucic Lovrencic et al., 2015, Yucel and Uysal, 2016, Duruturk and Ozkoslu, 2019, Aylin et al., 2009, Gilani and Feizabad, 2019), 1 study applied high-intensity exercises while the remaining 4 did not reported intensity of physical activity (Abdelbasset et al., 2020, Martinez-Velilla et al., 2021, Piette et al., 2011, Putiri et al., 2012).

3.4.5 Comparator

In the majority (n=16) of the included studies the comparator was usual care. The remaining 2 studies did not describe the care received by participants in the control group (Osama and Shehab, 2015, Saiiari et al., 2011).

3.4.6 Outcomes

Most of the studies used the BDI (n=8) and the Centre for Epidemiologic Studies Depression Scale (CES-D) (n=4) for assessing depressive symptoms. Out of 18 studies, 17 reported post-treatment results while only one study reported results at one-year follow-up (Vucic Lovrencic et al., 2015). Of the included studies, 10 reported effects of physical activity on glycaemic control (Aylin et al., 2009, de Groot et al., 2019, Duruturk and Ozkoslu, 2019, Kempf and Martin, 2013, Piette et al., 2011, Putiri et al., 2012,

Schneider et al., 2016, Vucic Lovrencic et al., 2015, Yucel and Uysal, 2016, Kraiwong et al., 2021). All these 10 studies used HbA1c.

3.4.7 Risk of bias

For a large proportion (n=11) of the included studies, four or more risk of bias domains were marked as “high risk” or “unclear risk” (Figure 2 & Supplementary Figure 1 (Appendix 2)).

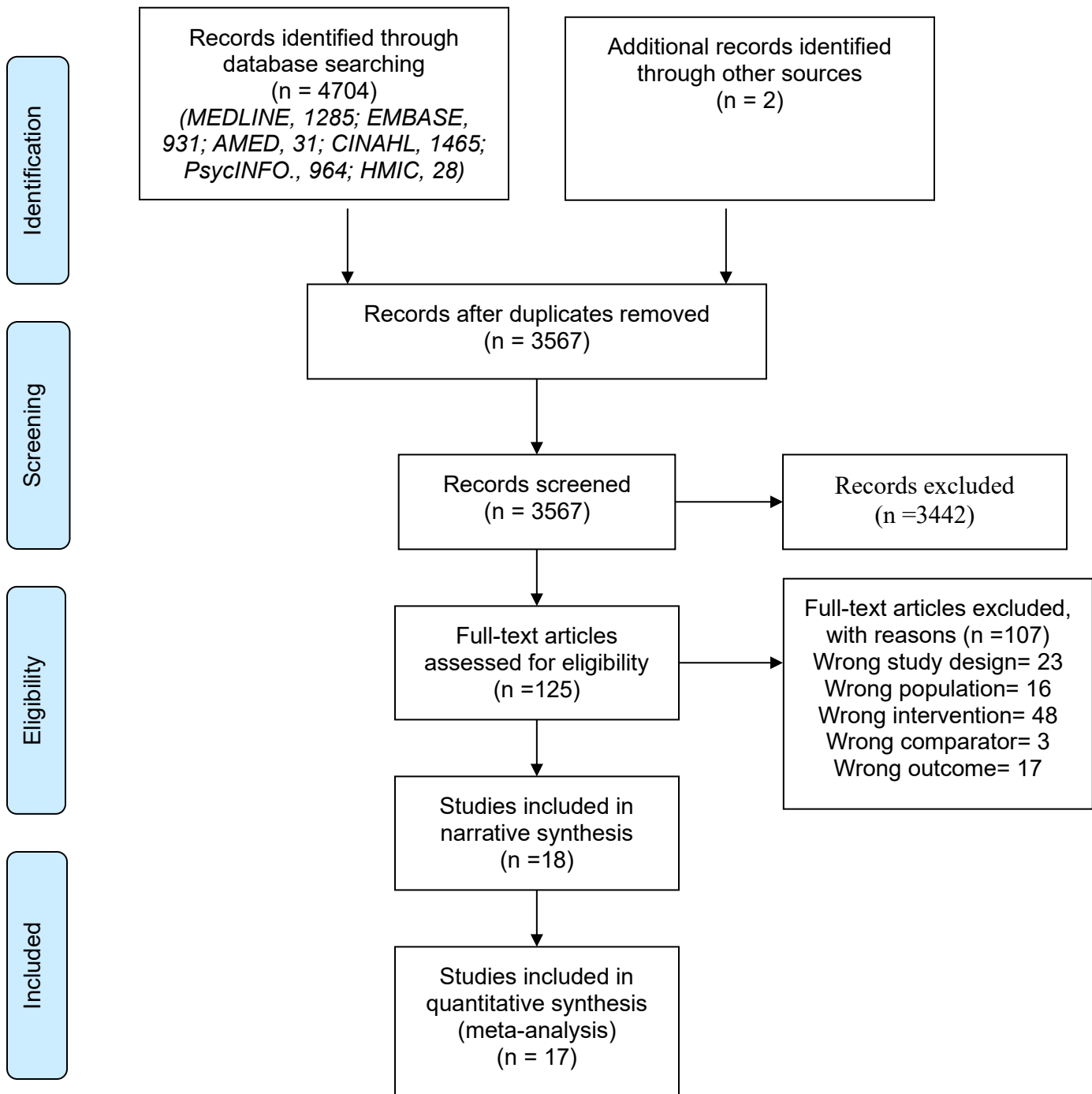


Figure 1: PRISMA flow chart

Table 1: Summary of studies included in systematic review

Author name (year)/ Country	Participant information	Treatment	Outcome measure (Depression)	Outcome measure (Glycaemic control)
Abdelbas set et al. (2020)/ Saudi Arabia	EG: 14 (8 M & 6 F) participants Mean age=53.4±5.3 years CG: 14 (7 M & 7 F) participants Mean age=52.8±5.7 years	EG: 45 min proprioceptive exercises (cross-body leg swings, single-leg squat, one-leg balance, forward & backward leg swings, blind advanced one-leg balance, side lunge) 3 sessions per week for 8 weeks CG: Usual care	HRSD Significant (p = 0.013) between-group difference	not reported
Aylin et al. (2009)/ Turkey	EG: 18 (15 M & 3 F) participants Mean age= 51.39±2.02 years CG: 18 (12 M & 6 F) participants Mean age= 56.06±1.48 years	EG: 30-45 min resistance training under the supervision of therapist & 15-45 min home-based walking, twice per week for 8 weeks CG: Instruction not to undertake any formal exercise during study period	CES-D No significant (P-value=0.48) between-group difference	HbA1c Significant (P-value=0.01) between-group difference
de Groot et al. (2019) / USA	EG (Exercise group): 34 (8 M & 26 F) participants Mean age= 54.6±10.7 years EG (Exercise+CBT group): 34 (6 M & 28 F) participants Mean age= 57.1±10.7 years CG: 36 (9 M & 27 F) participants Mean age= 54.2±10.4 years	EG (Exercise group): 100 to 150 min of moderate intensity community-based endurance exercises per week for 12 weeks including six sessions with a personal trainer. EG (Exercise+CBT group): Exercise+ 10 sessions of individual CBT for 12 weeks. CG: Usual care	BDI-II Exercise vs usual care: Significant (P=0.021) between-group difference Exercise+CBT vs usual care: Significant (P<0.001) between-group difference	HbA1c Exercise vs usual care: No significant (P=0.132) between-group difference Exercise+CBT vs usual care: Significant (P=0.016) between-group difference
Duruturk & Özköslü (2019)/ Turkey	EG: 23 (12 M & 11 F) participants Mean age= 52.82±11.86 years CG: 21 (14 M & 7 F) participants Mean age= 53.04±10.45 years	EG: 20-45 min callisthenic exercises (strengthening and stretching) at home, supervised through telerehabilitation approach, three times a week, for 6 weeks. CG: Usual care	BDI Significant (P<0.0001) between-group differences	HbA1c No significant (P=0.42) between-group difference

Author name (year)/ Country	Participant information	Treatment	Outcome measure (Depression)	Outcome measure (Glycaemic control)
Gilani & Feizabad (2019)/ Iran	EG: 30 M participants Mean age= 48.86±5.76 years CG: 30 M participants Mean age= 49.08±6.09 years	EG: 45–60 min of supervised aerobic exercise (stretching, slow running, followed by endurance training on treadmill) at 60-70% of maximum oxygen consumption, 3 sessions per week for 12 weeks. CG: Usual care	GHQ-28 No significant (P=0.078) between-group difference	not reported
Kempf & Martin (2013)/ Germany	EG: 93 (42 M & 51 F) participants Mean age= 61±7 years CG: 83 (35 M & 48 F) participants Mean age= 60±8 years	EG: Videogame based exercises using Wii console, balance board and exercise game Wii Fit Plus, 30 min per day for 12 weeks. CG: Usual care	CES-D No significant (P≥0.05) between-group differences	HbA1c No significant (P≥0.05) between-group difference
Krai Wong et al. (2021)/ Thailand	EG: 22 (7 M & 15 F) participants Mean age= 70.09±4.45 years CG: 15 (1 M & 14 F) participants Mean age= 72.87±6.42 years	EG: 45 to 60 minutes moderate-intensity exercises (aerobics, resistance exercises, and balance training) combined with cognitive training (memory, attention, and executive functions), 3 sessions per week for 8 weeks. CG: 4 sessions of health education	PHQ-9 No significant between-group difference	HbA1c No significant between-group difference
Lincoln et al. (2011)/ USA	EG: 29 (9 M & 20 F) participants Mean age= 66.0±7.9 years CG: 29 (12 M & 17 F) participants Mean age= 66.6±7.4 years	EG: 45-min resistance exercise training under supervision, three times per week for 16 weeks CG: Phone calls every other week and one-repetition maximum testing at baseline, weeks 9 and 16	GDS Significant (P<.0001) between-group difference	not reported
Martínez-Velilla et al. (2021) / Spain	EG: 54 (29 M & 25 F) participants Mean age= 87± 4 years CG: 49 (21 M & 28 F) participants	EG: Two daily, 20 min progressive resistance, balance and walking exercises, 5 to 7 days per week from admission to discharge.	GDS Significant (p<0.001) between-group difference	not reported

Author name (year)/ Country	Participant information	Treatment	Outcome measure (Depression)	Outcome measure (Glycaemic control)
	Mean age= 86 ± 5 years	CG: Usual care		
Mckay et al. (2001) / USA & Canada	EG: 38 participants CG: 40 participants Overall mean age= 52.3 years (37 M & 41 F participants)	EG: Personalized physical activity program tailored to individual needs of the participants for 8 weeks CG: Access to diabetes-specific articles and real-time blood glucose tracking	CES-D No significant (P-value=0.101) between-group difference	not reported
Osama & Shehab (2015)/ Saudi Arabia	EG: 50 participants Mean age= 36.35±5.11 years CG: 50 participants Mean age= 37.16±4.32 years Overall, 56 M & 44 F	EG: 40-min aerobic exercise (at 60%–80% maximum heart rate) on treadmill, three sessions per week for 12 weeks combined with dietary measures CG: No intervention	BDI Significant (P<0.05) between-group differences	not reported
Piette et al. (2011)/ USA	EG: 145 (71 M & 74 F) participants Mean age= 55.1±9.4 years CG: 146 (73 M & 73 F) participants Mean age= 56.0±10.9 years	EG: Pedometer-based walking program plus telephone-delivered CBT for 48 weeks CG: Enhanced Usual Care (educational materials about depression and diabetes)	BDI Significant (P<.0001) between-group difference	HbA1c No significant (P-value=0.70) between-group difference
Putiri et al. (2012)/ USA	EG: 11 participants Mean age= 58.4±7.4 years CG: 10 participants Mean age=59.4±6.8 years	EG: Progressive resistance training one-hour group session per week under supervision & practice same exercises at home for 30 min twice a week, for 12 weeks CG: Usual care	BDI Significant between-group difference	HbA1c No significant between-group difference
Saiari et al. (2011)/ Iran	EG: 30 M participants CG: 30 M participants Age range of 28-45 years	EG: 30-min crawl swimming, three to four days per week for 8 weeks CG: Not mentioned	BDI Significant (P=0.001) between-group difference	not reported

Author name (year)/ Country	Participant information	Treatment	Outcome measure (Depression)	Outcome measure (Glycaemic control)
Schneider et al. (2016)/ USA	EG: 15 F participants; Mean age= 53.3±6 years CG: 14 F participants; Mean age= 53.6±8 years	EG: 90-min group exercise 2 times per week for 16 weeks, once a week for 4 weeks, and then once every other week for 4 weeks in combination with BA CG: Usual care	BDI, HRSD No significant (P=0.37 BDI; P=0.09 HRSD) between-group difference	HbA1c No significant (P=0.78) between-group difference
Sradar et al. (2014)/ Iran	EG: 27 M participants Mean age= 44.93±5.35 years CG: 26 M participants Mean age= 45.56±5.41 years	EG: 45–60 min aerobic exercise (at 60%–70% maximum heart rate), three times per week for 8 weeks CG: Usual care	GHQ-28 No significant (p=0.657) between-group difference	not reported
Vucic Lovrencic et al. (2015)/ Croatia	EG: 66 (29 M & 37 F) participants Mean age= 58.5±4 years CG: 69 (33 M & 36 F) participants; Mean age= 58.2±5 years	EG: 90 min flexibility, stretching, and strengthening group exercises, weekly session for 6 weeks CG: Usual care & written self-help instructions to cope with mood difficulties	CES-D No significant (p=0.656) between-group difference at 1 year follow-up	HbA1c No significant (p=0.45) between-group difference at 1 year follow-up
Yucel & Uysal et al. (2016) / Turkey	EG: 24 F participants; Mean age= 58.50±7 years CG: 21 F participants; Mean age= 53.50±9 years	EG: 45 to 70 min stretching & basic aerobic Pilates training for arms, legs, and body, three times per week for 12 weeks CG: Usual care	HADS-D No significant (P=0.297) between-group difference	No significant (P=0.367) between-group difference
BA; Behavioural Activation, BDI; Beck Depression Inventory, CG; Control Group, CBT; Cognitive Behavioural Therapy, CES-D; Centre for Epidemiologic Studies Depression Scale, EG; Experimental Group, F; Female, GHQ-28; GDS; Geriatric Depression Scale, General Health Questionnaire-28, HADS; Hospital Anxiety and Depression Scale, HRSD; Hamilton Rating Scale for Depression, M; Male, min; minute, PHQ-9; Patient Health Questionnaire-9				

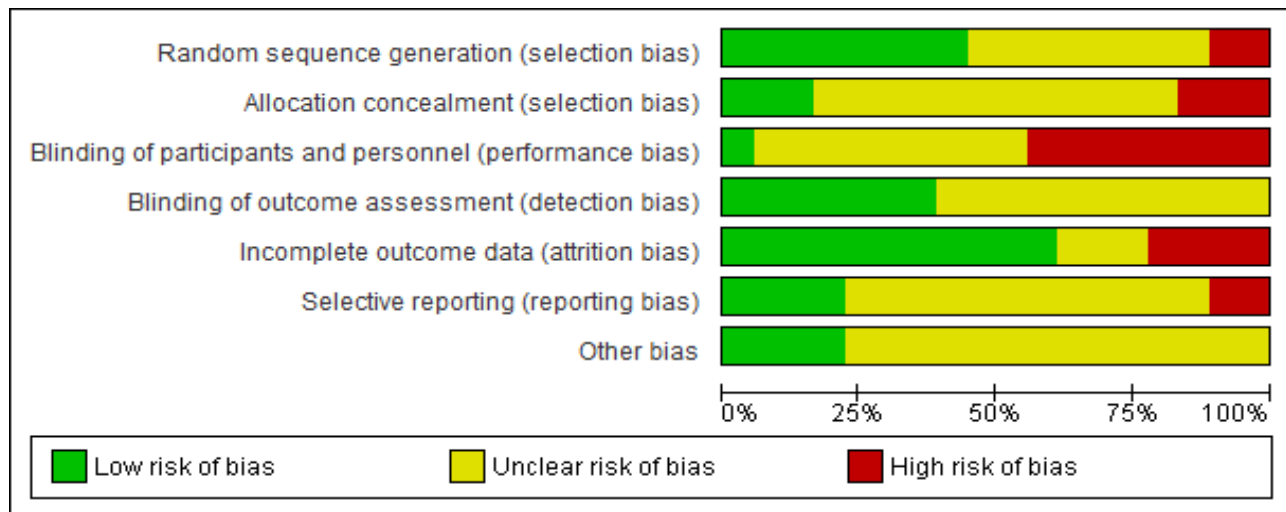


Figure 2: Risk of bias graph

3.4.8 Meta-analysis

3.4.8.1 Depression

Seventeen studies with 1362 subjects (705 in the physical activity group, 657 in the control condition) were included in the quantitative synthesis. One study (Krai Wong et al., 2021) was excluded from the meta-analysis because it lacked useable depression data to measure post-treatment means and standard deviations (SD). Of the included 17 studies, 13 clearly reported the post-treatment means and SD for both the physical activity group and the control group. For two studies, post-treatment means, and SD were obtained from study authors through email (Kempf and Martin, 2013, Putiri et al., 2012). One study reported the 95% confidence interval for the difference in means (Martinez-Velilla et al., 2021), from which we calculated standard error (SE) using the formula: $SE = (\text{upper limit} - \text{lower limit}) / 3.92$. We then calculated the SD for the SE using the formula: $SD = SE \times \sqrt{N}$

From one study, we included 3 groups, two of which were intervention groups (Exercise group and Exercise+CBT group) and one was the control group (de Groot et al., 2019). To combine the sample size, mean and SD of the two intervention groups, the following formulae were used;

	Group 1	Group 2	Combined groups
Sample size	N_1	N_2	$N_1 + N_2$
Mean	M_1	M_2	$\frac{N_1 M_1 + N_2 M_2}{N_1 + N_2}$
SD	SD_1	SD_2	$\sqrt{\frac{(N_1 - 1) SD_1^2 + (N_2 - 1) SD_2^2 + \frac{N_1 N_2}{N_1 + N_2} (M_1^2 + M_2^2 - 2 M_1 M_2)}{N_1 + N_2 - 1}}$

The pooled results showed that physical activity was effective in improving depressive symptoms in people with T2DM (SMD= -0.57, 95% CI= -0.80, -0.34). Nevertheless, the chi-squared test ($P < 0.00001$) and I^2 statistic (74%) showed that there was substantial heterogeneity in the included studies (Figure 3).

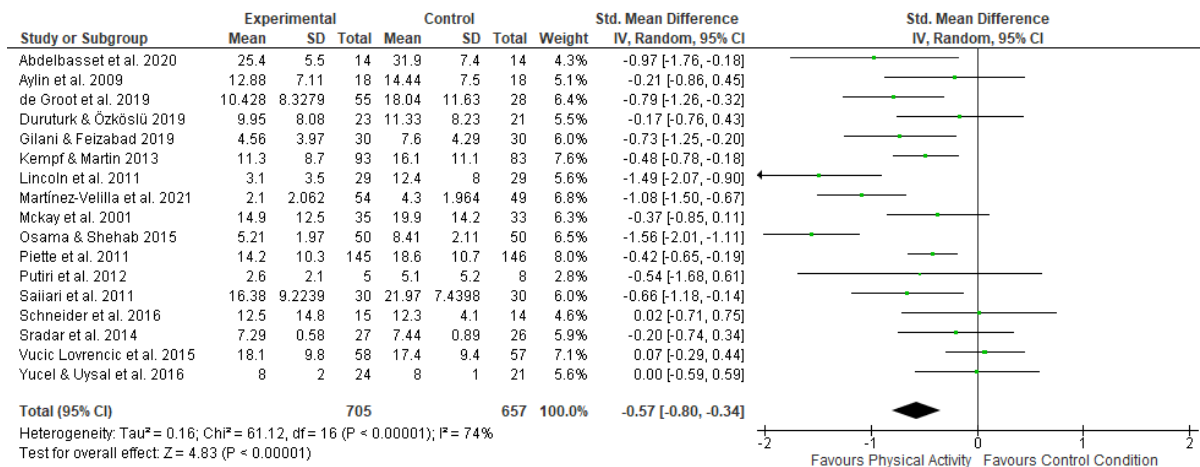


Figure 3: Comparison of physical activity versus control condition for improving depression

Subgroup analysis based on administering physical activity alone or in combination with other interventions revealed that effect of physical activity on depressive symptoms was statistically significant for physical activity administered alone or in combination with other interventions (Figure 4).

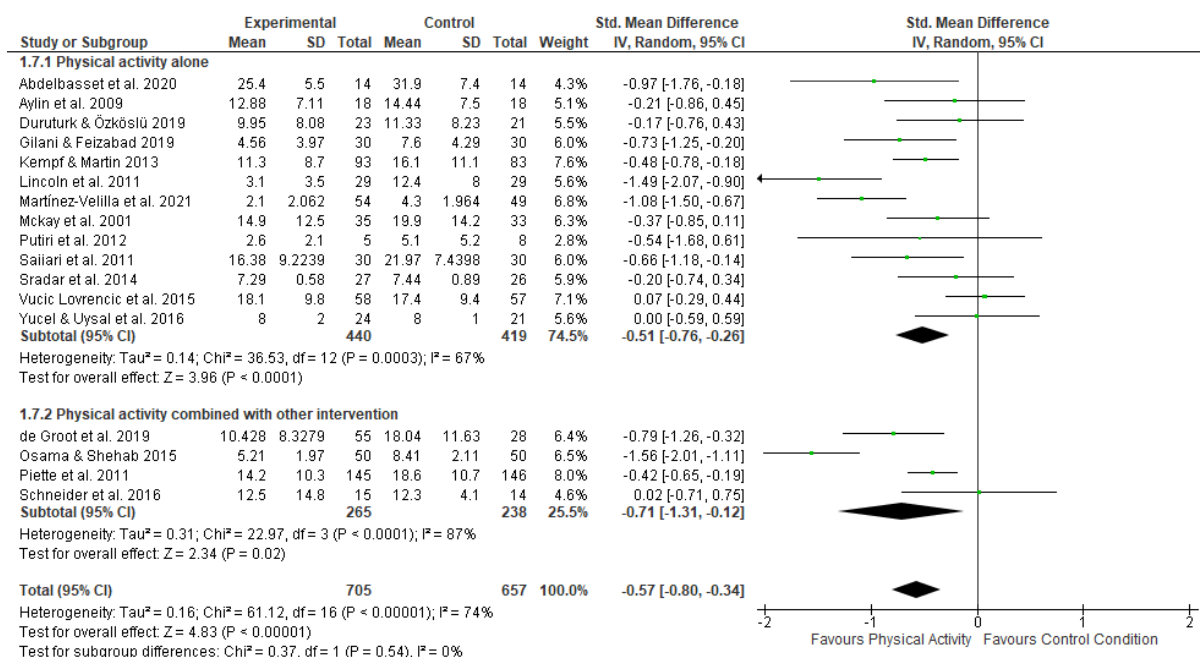


Figure 4: Subgroup analysis for depression based on administering physical activity alone or in combination with other interventions

Physical activity showed a statistically significant effect on depression in studies that included either male participants only or both male and female, but not in studies that included female participants only (Figure 5).

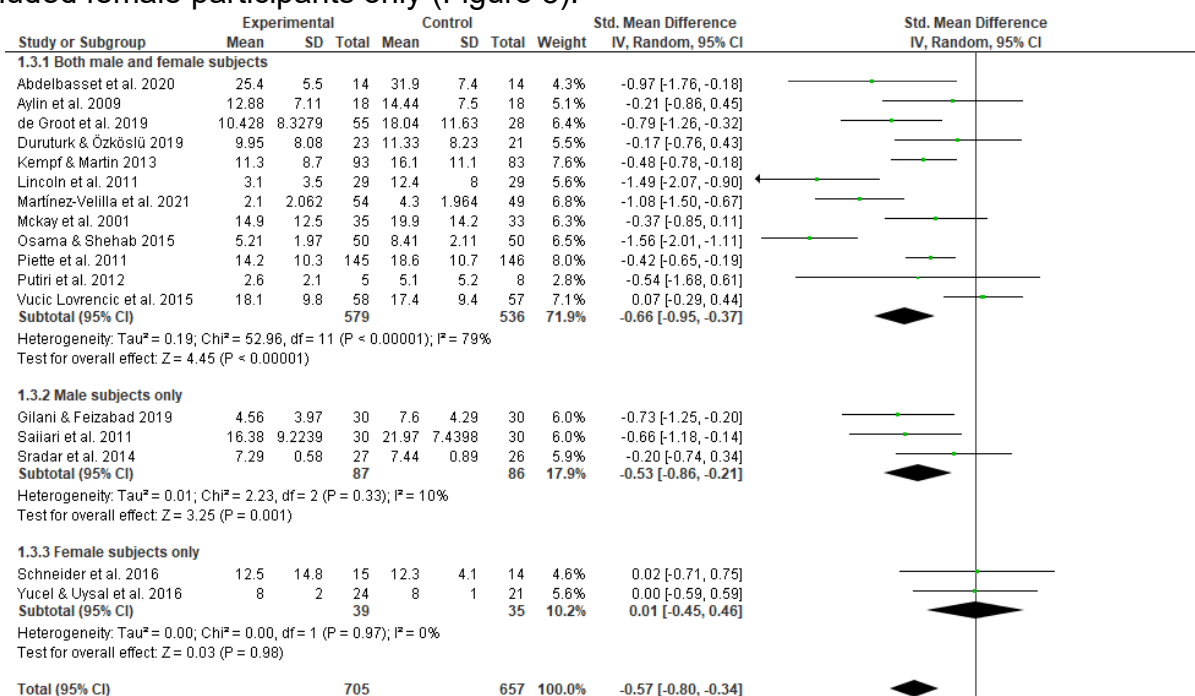


Figure 5: Subgroup analysis for depression based on gender

Physical activity was effective in improving depression symptoms in studies regardless of whether they included participants with or without the diagnosis of depression at baseline; however, the effect size was larger for studies that included participants without diagnosed depression (SMD -0.64 without diagnosis of depression vs. -0.43 with diagnosis of depression; Supplementary Figure 2 (Appendix 2)).

Subgroup analysis based on duration of physical activity showed that physical activity of both long and short duration was effective, but the longer duration interventions had larger effect size (SMD -0.68 for physical activity ≥ 10 weeks vs. -0.43 for physical activity < 10 weeks; Supplementary Figure 3 (Appendix 2)). Subgroup analysis based on economic status of the country revealed that effect of physical activity on depressive symptoms was statistically significant for both high-income country studies and LMICs (SMD -0.69 for high-income countries and -0.35 for LMICs). Heterogeneity was low ($I^2 = 10\%$) for studies conducted in LMICs while it was high ($I^2 = 81\%$) for studies conducted in high-income countries (Supplementary Figure 4 (Appendix 2)). In addition, effect of physical activity was statistically significant for both studies in which mean age of the participants was < 50 years and in study populations ≥ 50 years, but effect size was larger for studies with younger participants (SMD -0.80 for mean age < 50 years vs. -0.49 for mean age ≥ 50 years; Supplementary Figures 5 (Appendix 2)). Findings suggest that both high quality (four or more risk of bias domains marked as low risk) and low quality (four or more risk of bias domains marked as high risk or unclear risk) support the effectiveness of physical activity in alleviating depressive symptoms (Supplementary Figures 6 (Appendix 2)). Results showed both aerobic and resistance exercises had a significant effect on improving depressive symptoms but studies of mixed types of exercises did not show a significant effect (Supplementary Figure 7 (Appendix 2)). Visual inspection of the funnel plot showed no indication of publication bias in included studies (Supplementary Figure 8 (Appendix 2)).

3.4.8.2 Glycaemic control

Of the 10 studies included in the review that reported information about glycaemic control, nine were included in the quantitative synthesis. All nine studies reported HbA1c as a marker of glycaemic control. The results showed that physical activity did not have a significant effect in improving markers of glycaemic control (MD= -0.18; 95% CI= -0.46, 0.10) (Figure 6).

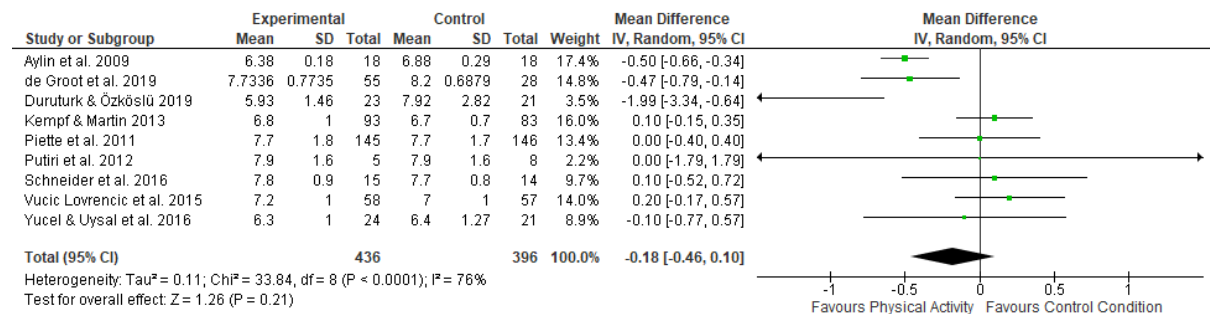


Figure 6: Comparison of physical activity versus control condition for improving glycaemic control

Subgroup analysis showed that physical activity was effective, however, in improving glycaemic control for studies conducted in LMICs (MD= -0.60; 95% CI= -1.24, 0.04) but not for studies conducted in high-income countries (MD= -0.03; 95% CI= -0.26, 0.21) (Figure 7).

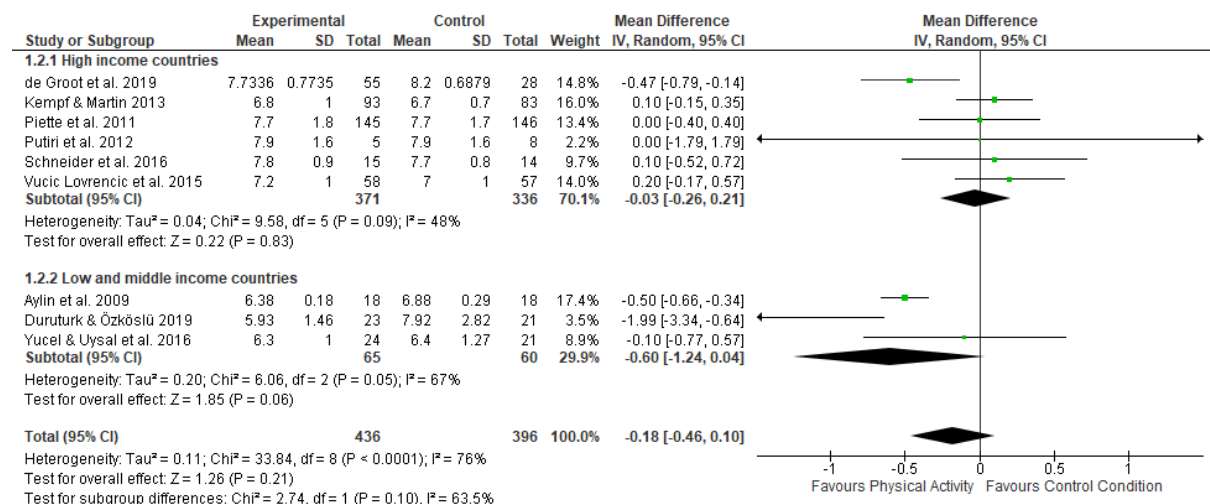


Figure 7: Subgroup analysis for glycaemic control based on economic status of the country in which study was conducted

Subgroup analysis for glycaemic control based on diagnosis of depression (inclusion of subjects with or without diagnosis of depression), duration of physical activity (≥ 10 weeks, < 10 weeks), combination of physical activity with other intervention (physical activity alone, physical activity combined with other intervention) and type of physical activity (aerobic exercises, resistance exercises, mixed types of exercises) showed that physical activity did not have a significant effect on glycaemic control for any of these subgroups (Supplementary Figures 9 to 12 (Appendix 2)).

3.5 Discussion

The review showed that physical activity improves depressive symptoms in adults with T2DM. There are consistent reports in the literature regarding the antidepressant effects of physical activity in the general population (Firth et al., 2018, Oberste et al., 2020, Kandola et al., 2019, Biddle et al., 2019), nevertheless, there is limited literature available regarding the effects of physical activity in managing depression among adults with co-morbid somatic illnesses, particularly T2DM. The only previous systematic review which assessed effects of physical activity in managing depressive symptoms in people with diabetes included both type 1 and type 2 diabetes and found 13 studies (Narita et al., 2019). It also reported that physical activity reduced depression in people with diabetes. The current review focused only on studies specifically in people with T2DM but found more studies: 18 for the qualitative synthesis and 17 studies for the quantitative synthesis.

The included studies were conducted in diverse countries. The majority were from the United States of America ($n=6$) followed by Iran ($n=3$), Turkey ($n=3$) and Saudi Arabia ($n=2$). The subgroup analysis based on the economic status of the country showed that physical activity was significantly effective for managing depression in both high-income countries and LMICs, though effects were larger in high-income countries. We were unable to locate any previous high-quality reviews that compared physical activity for the management of depression in high-income with LMICs; however, availability of resources may be the key determinant for physical activity having a larger effect size in high-income

countries. In addition, training of staff, literacy levels of the participants and socio-economic factors might affect the effectiveness of physical activity interventions in managing depression in LMICs. However, we were unable to assess these assumptions, as they were beyond the scope of this review.

We found physical activity reduced depressive symptoms in both participants with and without the diagnosis of depression verified at baseline. However, its effects were more compelling for studies that included participants without a prior diagnosis of depression. Although there is a paucity of literature to explain why and how physical activity might be more effective in reducing depressive symptoms in subjects without a clinical diagnosis of depression, it may be that individuals with a diagnosis of depression are less interested in performing physical activity and the effectiveness of physical activity may therefore be compromised (Schuch and Stubbs, 2019, Radovic et al., 2018, Helgadóttir et al., 2018). As most of the included studies did not specify severity of depression at baseline, it was not possible to perform subgroup analysis based on this. However, severity might also affect the effectiveness of physical activity in managing depression.

The literature suggests that physical activity can have a positive effect on depression in both men and women (Belvederi Murri et al., 2019, Wang et al., 2022, Lin et al., 2015). However, in our review, in studies which included only women participants, physical activity was not effective. This discrepancy may arise due to the low number of studies with small sample sizes which included only women subjects. Subgroup analysis based on age revealed that physical activity was more effective for managing depression in studies with participants mean age of less than 50 years. This suggests that physical activity might have more beneficial effects on mental health of relatively younger individuals.

Recent systematic reviews have reported that physical activity combined with other interventions, such as psychological therapies, have more beneficial effects in improving mental health (Cooper et al., 2020, de Groot et al., 2019). The current review also reported that studies that combined physical activity with other interventions have

comparatively larger effects in reducing depressive symptoms. Similarly, results showed that studies that applied physical activity intervention for longer durations are considerably more effective in managing depression among adults with T2DM. In addition, results from the current review showed that both aerobic and resistance exercises were considerably effective in improving depressive symptoms, nonetheless, studies that used mixed types of exercises were not significant in managing depression. There are inconsistencies in the literature regarding the optimal duration and type of physical activity recommended for managing depression. Nonetheless, some studies suggested that rather than focusing on duration and type of physical activity, attention must be focused on motivating individuals with depressive symptoms to perform something physical. They assume that it is not the determinants of physical activity (i.e. type and duration) that determine the effectiveness of physical activity in treating depression, rather there are other mechanisms such as breaking the pattern of sustained behaviours via exercise and other psychological and contextual factors through which physical activity exerts its positive effects in reducing depressive symptoms (Helgadóttir et al., 2016, Nyström et al., 2015, Robertson et al., 2012, Schuch et al., 2016, Danielsson et al., 2013).

We found only a limited number of studies reporting effects of physical activity on glycaemic control. Physical activity did not have a significant effect in improving HbA1c levels, though it modestly assists (MD -0.18) in achieving glycaemic control in people with T2DM. It is interesting to note that when we applied a fixed effect model on HbA1c data, it showed significant results (MD= -0.27; 95% CI= -0.37, 0.16) for improving glycaemic control (Supplementary Figure 13 (Appendix 2)). However, as per review protocol, we reported the findings of the random effects model in results. Contrary to findings of the current review, previous studies have reported that physical activity considerably improves HbA1c in individuals with T2DM (Shah et al., 2021, Li et al., 2019, Wake, 2020, Amanat et al., 2020). The findings are based on only the handful of studies that have reported effects of physical activity on both depressive symptoms and glycaemic control and may therefore not be robust for glycaemic control related outcomes. Furthermore, in the current review, we conducted a meta-analysis based on mean and SD, as the majority of the studies reported the mean and SD as a measure of central tendency and

dispersion; baseline differences may therefore have biased the post-intervention results. For instance, in Kemp & Martin's study, HbA1c baseline scores in the physical activity group and control group were $7.1 \pm 1.3\%$ and $6.8 \pm 0.9\%$ respectively while post-treatment scores were 6.8 ± 1.0 and 6.7 ± 0.7 respectively. There was a reduction in HbA1c in the physical activity group only ($-0.3 \pm 1.1\%$), but not in the control group ($-0.1 \pm 0.5\%$); nevertheless, forest plot for the meta-analysis showed results in favour of the control group due to baseline differences. The subgroup analysis for glycaemic control based on economic status of the country showed that physical activity did have significant effects on achieving glycaemic control in LMICs, (which is more consistent with the wider literature). Nonetheless, due to the wide confidence interval and small sample size, these findings should be interpreted with caution.

To the best of our knowledge, the current review is the first to report on the effects of physical activity in managing depression specifically in individuals with T2DM. We published a review protocol and followed established methods for a high-quality systematic review of effectiveness studies (Moher et al., 2009, Higgins et al., 2019). We performed a comprehensive search to locate all relevant RCTs and conducted subgroup analyses, agreed a priori, to investigate important differences relevant to guiding practice and policy.

3.5.1 Limitations

There are some limitations to acknowledge in interpreting the findings of this review, relating to both the studies included in the review and review methods. To begin with, there was substantial heterogeneity in the methods and results of included studies. Risk of bias assessments showed that most studies were of low quality. Moreover, there were only a few studies that separately reported effects of physical activity in managing depressive symptoms among women, therefore I was not able to draw firm conclusions about gender differences. Similarly, only limited number of studies reported effects of physical activity on glycaemic control, making it difficult to deduce definitive conclusions for this part of the review. Finally, although we searched a number of different databases and used broad search terms, it is possible that we may missed some studies.

3.5.2 Implications

The review has important implications for policy, practice, and future research. We found physical activity alone or in combination with other interventions is effective in improving depression symptoms in individuals with T2DM. Despite this evidence, physical activity is still underutilized, especially in LMICs. Unlike antidepressants, which are widely prescribed, clinicians do not regularly assess or prescribe physical activity in routine care. Thus, the challenge remains to translate evidence on the health benefits of physical activity to use in practice in the health care system. There is an urgent need for policies and guidance to promote the prescription of physical activity for the management of depression in clinical settings. Future research should focus on implementation and scale-up strategies to promote exercise prescription in the management of depression in routine clinical care. Furthermore, the non-significant effect of physical activity among women in managing depressive symptoms highlights the need to further explore the factors that affect the uptake of physical activity among women with depression and T2DM.

3.6 Conclusion

Physical activity can effectively reduce depressive symptoms in adults with T2DM. Furthermore, physical activity might be a suitable adjunct to other interventions in managing depression in T2DM in both high-income countries and LMICs. Nonetheless, it appears that physical activity may not be significantly effective in improving glycaemic control in adults who have both type 2 diabetes mellitus and depressive symptoms. Our finding that physical activity may not be effective in achieving glycaemic control in people with depressive symptoms and T2DM is surprising. Given the limited evidence on which this is based, future research on the effectiveness of physical activity for depression in this population should include high quality trials with glycaemic control as an outcome.

Additional considerations related to the systematic review and meta-analysis

3.7 Methodological considerations

3.7.1 Review Protocol

The review protocol was prospectively registered with PROSPERO (<http://www.crd.york.ac.uk/prospERO/>), a web based international prospective registry of systematic reviews, maintained by Centre for Review and Dissemination University of York and funded by National Institute for Health and Care Research (NIHR). Although review protocols can be published in other public domain registries such as Open Science Framework (<https://osf.io/>), PROSPERO is considered more appropriate registry for prospective systematic reviews with a health-related outcome (Schiavo, 2019, Bernardo, 2017, Booth et al., 2012). The review protocol was developed according to the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) statement (Moher et al., 2015), and was refined under the supervision of PhD supervisors. The review protocol was submitted to the Covidence Global Scholarship Program 2022, and was selected for a tier 2 Covidence Scholarship (Covidence, 2022).

3.7.2 Inclusion and exclusion criteria for studies

In the systematic review, only RCTs were included. The objective was to assess the effectiveness of physical activity, therefore RCTs were the most suitable studies to be included as RCTs are considered to provide the highest level of evidence to assess effectiveness of interventions (Matthews, 2006, Spieth et al., 2016). A clinical diagnosis of depression (as opposed to the presence of depressive symptoms) was not mandatory for inclusion. Studies which recruited individuals with T2DM who underwent an evaluation for depressive symptoms at baseline and post-intervention/follow-up, were included. I performed subgroup analysis to specifically assess the effects of physical activity for participants with a diagnosis of depression. Previous systematic reviews which assessed effectiveness of physical activity for the management of depression in different populations have applied a similar approach (Thomas et al., 2020, Wang et al., 2022, Wu

et al., 2017, Narita et al., 2019). I chose to be inclusive and included studies which reported depressive symptoms for participants, irrespective of clinical diagnosis of depression as it allowed me to include a wider range of studies and to conduct a subgroup analysis to understand the effects of physical activity for diagnosed depression and depressive symptoms. Studies that applied any form of physical activity (aerobic, resistance and mixed type of physical activity) in the intervention were included. Similarly, studies that applied physical activity alone or in combination with any other interventions such as psychological therapies were included. The purpose was to conduct subgroup analyses and to comment on the effects of different types of physical activity interventions for managing depressive symptoms in people with T2DM.

3.7.3 Databases searched and search strategy

There are no specific guidelines available regarding the number of databases that need to be searched for conducting a systematic review. However, generally, it is recommended that more than one database should be searched (Bramer et al., 2013, Bramer et al., 2016). Some studies have tried to identify a minimum number of databases that need to be searched when conducting a systematic review (Ross-White and Godfrey, 2017, Goossen et al., 2018, Lefebvre et al., 2019). Studies suggested searching at least three databases; “one giant database and two subject-specific databases” (Bar-Ilan, 2018, Bramer et al., 2017). There is also debate about which specific databases need to be searched. Studies which assessed the optimal combination of databases for biomedical systematic reviews reported that regardless of the review question, MEDLINE and EMBASE need to be searched. In addition to these, subject-specific databases such as PsycINFO need to be searched (Bramer et al., 2017, Gusenbauer, 2022). Therefore, I searched six databases (MEDLINE, EMBASE, AMED, CINAHL, PsycINFO, and Health Management Information Consortium) to find relevant studies. Moreover, reference lists of the included articles and relevant systematic reviews were also checked to ensure a comprehensive search, as advised by the Cochrane Handbook (Higgins and Green, 2008, Cumpston et al., 2019).

Separate search strategies were used for each database (Appendix 1). Search strategies were developed based on three key concepts: Physical Activity, Depression, and Diabetes Mellitus. Both subject headings and free-text words were used to retrieve the maximum number of records. The initial search strategies were developed from previously published systematic reviews (Uphoff et al., 2020b, Bullard et al., 2019). PhD supervisors, members of thesis advisory panel and University of York librarian assisted in refining the search strategies.

3.7.4 Involvement of two independent reviewers

In systematic reviews, the involvement of two independent reviewers is generally recommended for study selection, data extraction and risk of bias assessment. It ensures transparency of the study selection process and the reliability of results (Higgins and Green, 2008, Pollock and Berge, 2018, Wang et al., 2020). As per recommendations of “Cochrane Handbook for Systematic Reviews of Interventions” (Higgins and Green, 2008, Cumpston et al., 2019), two independent reviewers were involved in the systematic review at title and abstract screening stage and at full text screening stage. Data extraction and risk of bias assessment was also performed by two independent reviewers. Disagreements between the two reviewers were resolved by discussion and if needed, a third reviewer was consulted to make the final decision.

3.7.5 Use of random effects model

I conducted meta-analyses using a random-effects model. There are no explicit guidelines regarding the application of fixed-effect model or random-effects model. Literature suggests that random-effects model should be used when studies are not identical but have enough in common to be included in the meta-analysis and thus data fluctuation or clustering need to be taken into consideration (Borenstein et al., 2010, Spineli and Pandis, 2020, Dettori et al., 2022, DerSimonian and Kacker, 2007). Dettori et al. (2022) discussed different assumptions for using random effects and fixed effect model and reported which model to use depends on the circumstances, however, generally, the random-effects model is more appropriate for a meta-analysis with variations across the

studies. Dettori et al. (2022) argued that random effects models capture uncertainty resulting from heterogeneity among studies (Dettori et al., 2022).

Therefore, after consultation with systematic review experts (“Systematic Reviews” module instructors, PhD supervisors and colleague with previous expertise in conducting systematic reviews and meta-analyses) and after studying relevant literature, I decided at the protocol stage, that I would use a random effects model because the characteristics of the physical activity interventions applied in different RCTs would vary considerably, the outcome measures used for assessing depressive symptoms could vary considerably, and participant characteristics and comparators may have variation across the studies.

3.7.6 Reporting and dissemination

The systematic review and meta-analysis was conducted in accordance with the recommendations of “Cochrane Handbook for Systematic Reviews of Interventions” (Higgins and Green, 2008, Cumpston et al., 2019), and was reported according to “Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA)” statement (Moher et al., 2009, Page et al., 2021). The review was published in a peer reviewed journal (Arsh et al., 2023a).

3.8 Ethical considerations

The review did not involve primary data collection; therefore, ethical approval was not required.

Before conducting a systematic review, it is important to ensure that there is an important research gap, to avoid the wastage of research resources. Therefore, before formulating my research question, I thoroughly studied available literature to ensure the need for conducting a systematic review. In the introduction section of my systematic review, I highlighted the research gaps and presented the rationale for conducting the systematic review.

Moreover, it is important to maintain integrity in conducting and reporting the review transparently and acknowledge contributions of all those who contributed. I followed standard guidelines for conducting and reporting the systematic review (section 3.7.6) and explained each step in the final report. Similarly, all the contributors are acknowledged appropriately.

3.9 The way forward

The systematic review reported that physical activity administered alone or in combination with psychotherapeutic interventions effectively reduced depressive symptoms in adults with T2DM, although studies that combined physical activity with other interventions have larger effects in reducing depressive symptoms. Moreover, physical activity was effective in managing depressive symptoms in people with T2DM in both high-income countries and LMICs. However, studies which included only women participants showed that the effects of physical activity were non-significant for managing depressive symptoms in women with T2DM. Moreover, the review reported that physical activity was not effective for improving glycaemic control in people with depressive symptoms and T2DM. The former findings were encouraging as they support the argument for adapting integrated BA and physical activity interventions for people with depression and T2DM in Pakistan. However, the latter findings were surprising as they were in contrast with the wider literature. However, as these findings were based on limited evidence there was a need for further exploration to explain these anomalous findings.

Literature suggested that certain factors can affect the potential effectiveness of physical activity in people with depression. Limited uptake of physical activity by people with depression might be one such factor that could limit its potential effectiveness in this population (Horne and Tierney, 2012, Callaghan et al., 2011, Morgan, 2001). While there was a gap in literature focusing specifically on the association of uptake of physical activity with its potential effectiveness among men and women with depression, however, there were some studies that reported limited uptake of physical activity as a possible explanation for the limited role of physical activity in reducing depressive symptoms

among women compared to their male counterparts (Cahuas et al., 2020, Sharkey, 2019). Cahuas et al. (2020) reported that physical activity was significantly associated with lower depressive symptoms among men, but no form of physical activity had a significant association with depressive symptoms for women. The authors argued that although there were no explicit reasons for the differences in the findings for men and women, sociocultural and biological factors might affect the uptake of physical activity among women, which might be responsible for the limited effects of physical activity in women (Cahuas et al., 2020). Given the limited evidence on which this interpretation was based, no firm conclusions could be drawn. Therefore, it was imperative to further explore factors that can affect the uptake of physical activity in this population.

There was a need for context-specific research studies to better understand enablers and constraints to the uptake of physical activity in different settings. In order to explore the specific facilitators and barriers to engaging in physical activity for people with depression and T2DM in Pakistan, a qualitative study was designed and conducted. The detailed rationale, design and findings are presented in the next chapter of this thesis.

Chapter 4: A qualitative study to assess barriers & facilitators to physical activity in people with depression and type 2 diabetes mellitus in Pakistan

This study has been published as an original article:

Arsh, A., Afaq, S., Carswell, C., Coales, K. & Siddiqi, N. (2023). Barriers & facilitators to physical activity in people with depression and type 2 diabetes mellitus in Pakistan: A qualitative study to explore perspectives of patient participants, carers and healthcare staff. Mental Health and Physical Activity, 25, 100542.

Role of each author is described in the preface (Page 15-17).

This chapter describes a qualitative study that explored constraints and enablers to physical activity in people with depression and T2DM in Pakistan. The components of the study published in Mental Health and Physical Activity (abstract, introduction, methods, results, discussion, and conclusion) are presented in sections 4.1 to 4.6. Additional considerations (methodological and ethical considerations) related to the qualitative study are presented in section 4.7 and 4.8. At the end of the chapter, a way forward (section 4.9) is presented that links the findings of this chapter with the next chapter of the thesis.

Barriers & facilitators to physical activity in people with depression and type 2 diabetes mellitus in Pakistan: A qualitative study to explore perspectives of patient participants, carers and healthcare staff

4.1 Abstract

Background: The health benefits of physical activity in adults with depression and T2DM are well established, however people with depression and T2DM do not generally reach recommended levels of physical activity. Evidence on how to support physical activity in this group is limited; this is particularly the case in low- and middle-income countries. To develop interventions to promote physical activity, it is important first to understand the barriers and facilitators in this population.

Methods: A qualitative study was conducted in Pakistan using semi-structured individual interviews. Adults diagnosed with depression and T2DM, their carers, and healthcare staff were included. Interviews were audio-recorded and transcribed verbatim. Inductive thematic analysis was used to identify themes.

Results: Twenty-three participants (12 male; 11 female) were recruited. Five themes were generated from the data: 1) Cultural and religious norms and practices influence physical activity behaviours 2) Availability of resources and the potential for incorporating physical activity into routine life determine physical activity behaviours 3) Available healthcare resources can be used to promote physical activity 4) Patients' individual-level characteristics affect their physical activity behaviours 5) Technology-based interventions may be used to promote physical activity.

Conclusion: Individual, cultural, and healthcare system level barriers and facilitators can affect the participation of people with depression and T2DM in physical activity. Religious, social, cultural, domestic, and occupational activities provide opportunities to perform physical activities. Furthermore, harnessing routinely available healthcare resources and the use of technology-based interventions can facilitate the promotion of physical activity.

4.2 Introduction

Evidence suggests that there is a bidirectional association between depression and T2DM (Khaledi et al., 2019, Li et al., 2019). It is estimated that adults with depression have a 34% higher risk of developing T2DM while people with T2DM have a 28% higher risk of developing depression (Zhuang et al., 2017). The prevalence of depression among people with T2DM in LMICs is reported to be 44.5% (Kalra et al., 2020, Farooqi et al., 2022), while a meta-analysis of 83 studies reported a prevalence of 40% in 3 South Asian countries (Pakistan, Bangladesh, India) (Uphoff et al., 2020b), considerably higher than the estimated global prevalence.

In addition to pharmacotherapy and psychotherapy, the management of depression in T2DM includes supporting self-care and promoting positive lifestyle changes including increasing physical activity (Hoogendoorn et al., 2021). The antidepressant effects of physical activity are well-established in the general population (Kandola et al., 2019, Narita et al., 2019). Studies suggest that these positive effects are also seen in people with depression and T2DM (Narita et al., 2019, Arsh et al., 2023a). In addition, physical activity can help improve glycaemic control in T2DM (Shah et al., 2021).

Despite these well-reported health benefits, few people, particularly in LMICs, adhere to regular physical activity routines (Katzmarzyk et al., 2022, Liu, 2022). Although physical activity levels among people with depression and T2DM in Pakistan have not been estimated, it has been suggested that physical activity might be much lower in this population compared to that observed in the general population (Arshad et al., 2016). Non-availability of resources is generally considered the main barrier to physical activity and exercise in LMICs (Muzenda et al., 2022, Elshahat et al., 2020). However, evidence suggests that low to moderate-level, non-structured physical activity that does not require too many resources might be sufficient to alleviate depressive symptoms in this population (Chang et al., 2019, de Groot et al., 2019, Arsh et al., 2023a).

Research from LMICs suggests that environmental interventions (public parks, playgrounds, green spaces, swimming pools), social interventions (walking or cycling groups, worksite physical activity) and behavioural interventions (goal setting, education, reinforcement of positive behaviours) can assist in the promotion of physical activity. Nonetheless, these studies primarily focused on the general population (Raskind et al., 2020, Barbosa Filho et al., 2016, Abdelbasset et al., 2020). There are few studies that have either assessed facilitators or barriers to physical activity, or described interventions and mechanisms to promote physical activity, specifically in people with depression and T2DM living in LMICs. In Pakistan, a LMIC with limited healthcare resources, promotion of physical activity is seldom considered in the healthcare system. This is particularly the case in some parts of the country, such as Khyber Pakhtunkhwa province, where Pashtuns are the predominant ethnic group. Pashtuns in general, and female members of this ethnic group in particular, tend to strongly observe their cultural and religious codes. Therefore, existing cultural and religious principles may influence their physical activity behaviours. We need to better understand the barriers and facilitators specific to this population to design cultural and resource-appropriate interventions.

4.2.1 Objective

The objective of the study was to explore experiences, perceptions, and attitudes of people with depression and T2DM, their carers, and healthcare staff about supporting physical activity in people with depression and T2DM in Pakistan.

4.3 Methods

4.3.1 Study design

A qualitative study was conducted using semi-structured individual interviews from May 2022 to January 2023.

4.3.2 Participants identification

Participants were people with depression and T2DM, their carers, and health care staff supporting this population. Participants were identified from Abaseen Institute of Medical

Sciences (AIMS) Diabetes Hospital & Research Centre Peshawar, Khyber Pakhtunkhwa Pakistan. AIMS Hospital, also known as Sugar Hospital, is a specialized diabetes care facility, which is sponsored by a non-government organization (NGO) “AIMS Pakistan” and provides a full range of diabetes care services at an affordable cost.

4.3.2.1 Patient-participants

Individuals with a physician confirmed diagnosis of T2DM, aged ≥ 18 years, diagnosed with major depressive disorder as defined by the Structured Clinical Interview for DSM-V disorders, and who consented to participate in the study were included. Patients from the designated study sites were identified with the help of healthcare staff. The researcher informed the healthcare staff about the study to ensure they were aware of the selection criteria and had sufficient information to answer any questions patients had about the study. Potential participants were provided an envelope containing a cover letter and a participant information sheet. A contact number and email address were provided for the patients use if they wished to participate.

4.3.2.2 Carers

Individuals, aged ≥ 18 years, nominated by the patients as a carer, who provide care to a family member with a clinical diagnosis of depression and T2DM, and were able to provide informed consent, were included. Carers were identified with the help of healthcare staff and patients participating in the study. Carers identified by healthcare staff were approached using the same procedure described for the patient-participants. Carers identified by patient-participants were provided with a sealed envelope containing a cover letter and a participant information sheet, with a contact number and email address to use if they wished to participate.

4.3.2.3 Healthcare staff

Diabetes specialists (diabetologist/endocrinologist), mental health specialists (psychiatrists/psychologists), and other health care staff (nurses, nutritionists, physical therapists, and paramedical staff), involved in the care of people with depression and T2DM were included. Leaflets and participant information sheets containing information

about the research study and information on how to get involved were distributed among healthcare staff at the study site.

4.3.3 Recruitment

When potential participants made contact, a researcher scheduled meetings with them to confirm their eligibility and answer any queries about the study. Participants were given sufficient time to review the participant information sheet and discuss their potential participation with their family members or healthcare providers. Eligible participants were asked for their preferred date, time, and location for the interview. Depending on literacy levels, participants provided either thumbprints or signatures to confirm written informed consent.

4.3.4 Data collection

Separate interview guides were used for each group of participants (patients, carers, healthcare staff). The documents (interview guides, participant information sheets, and consent form) were translated to Urdu by a researcher with proficiency in both English and Urdu.

Individual interviews were conducted with each participant in a comfortable, private space. Participants were interviewed either at Khyber Medical University Peshawar or at the recruiting study site (as agreed between the researcher and participants). The interviews were conducted in Urdu or Pashto (depending on participant preference) and were audio-recorded with permission. Interviews were transcribed verbatim in the local language and later translated to English. The transcription and translation of the interviews were performed by a researcher with proficiency in both English and local languages. An independent team member reviewed the accuracy of transcribed and translated transcripts against the recorded audios. For confidentiality purposes, any identifiable information was removed from the final transcripts. The recruitment of participants continued until it was determined that new interviews added limited new information to the existing data. The author AA informed the research team about the possible saturation of the data after interviewing 21 participants. The research team

discussed the value of balancing the resources for further interviews and the possibility of the new themes emerging. Two more interviews were conducted, and the recruitment ceased after a consensus meeting.

4.3.5 Data analysis

Inductive thematic analysis was used following the six steps for thematic analysis described by Braun and Clarke (Braun and Clarke, 2006, Braun and Clarke, 2022). In the first step, AA studied the transcribed and translated interviews to become acquainted with the data. During the first stage of data analysis, recurring concepts were highlighted with different colours. After familiarization with the data, a coding scheme was developed based on recurring concepts identified in step one. In step two, initial codes were generated by AA according to the coding schemes. These were shared with the research team and were revised following feedback. In the third step, repeated and converging codes were grouped into secondary codes, subthemes and themes by AA and were presented to the research team in a tabulated form, along with supporting quotes from participants. In step four, secondary codes, subthemes, and themes identified in step three were reviewed by the research team and were further refined. In the fifth and sixth steps, themes were named, and the final report was produced.

4.3.6 Reflexivity

Several factors may have influenced the study findings. The principal author (AA) is a physical therapist by profession and has a personal preference for physical activity as an intervention to prevent and manage chronic conditions. In addition, AA is from the same cultural and religious background in Pakistan as that of the participants and has witnessed low levels of physical activity in the Pakistani population, especially in women. Being of a similar background to the participants, AA has personal experiences of physical activity facilitators and barriers. Furthermore, one of AA's family members (mother) has depression and T2DM. After noticing a decline in her physical activity levels, AA tried to support his family member to increase her physical activity, by streamlining her existing activities to achieve her desired physical activity goals. These experiences gave AA some insight into promoting physical activity in people with depression and T2DM. As a

healthcare professional, AA used personal contacts to help with the recruitment of participants, especially recruitment of other healthcare professionals, although none of the participants were the researcher's friends or family. It is possible that participants may not have been as open in discussing facilitators and barriers if the researcher had not been a healthcare professional (as participants usually trust healthcare professionals and think they might help improve their condition).

4.3.7 Ethics approval

Ethics approval was obtained from the Health Sciences Research Governance Committee University of York United Kingdom (Reference No. HSRGC/2022/498/A, dated 6th May 2022) and Ethics Board of Khyber Medical University Pakistan (Reference No. DIR/KMU-EB/CB/00115, dated 23rd May 2022; Appendix 5).

4.4 Results

4.4.1 Participants

A total of 23 participants were interviewed, including 11 patient participants (6 female and 5 male), 8 healthcare staff (3 female and 5 male) and 4 carers (2 female and 2 male) (Table 2). All 23 participants were of Pashtun ethnicity.

Table 2: Demographic information of the participants (n=23) recruited for the qualitative study

S.No.	Role	Age (years)	Gender	Education	Occupation/ speciality
1	Patient-participant	48	Male	Matric (10 years of education)	Security guard
2	Patient-participant	51	Male	Primary (5 years of education)	Shopkeeper
3	Patient-participant	56	Male	Religious education (Dars-e-Nizami)	Khateeb (religious scholar)
4	Patient-participant	42	Female	Bachelor (14 years of education)	Housewife
5	Patient-participant	61	Male	PhD Urdu	Retired Professor

6	Patient-participant	54	Female	Master (16 years of education)	School Teacher
7	Patient-participant	40	Male	No formal education	Farmer/ labourer
8	Patient-participant	63	Female	Intermediate (12 years of education)	Retired schoolteacher
9	Patient-participant	55	Female	No formal education	Housewife
10	Patient-participant	50	Female	Matric (10 years of education)	Housewife
11	Patient-participant	44	Female	BS in computer science	Computer operator
12	Healthcare staff	38	Male	MBBS, Fellow of College of Physicians and Surgeons (FCPS)	Diabetologist
13	Healthcare staff	33	Male	MS in clinical psychology	Psychologist
14	Healthcare staff	30	Female	MS in Physical Therapy	Physical Therapist
15	Healthcare staff	42	Male	MBBS, Fellow of College of Physicians and Surgeons (FCPS)	Psychiatrist
16	Healthcare staff	29	Female	MS in clinical psychology	Psychologist
17	Healthcare staff	28	Female	BS in nutrition sciences	Nutritionist
18	Healthcare staff	35	Male	MBBS, Fellow of College of Physicians and Surgeons (FCPS)	Endocrinologist
19	Healthcare staff	27	Male	BS in Nursing	Nurse
20	Carer (wife)	50	Female	Matric (10 years of education)	Housewife
21	Carer (husband)	56	Male	MPhil Biology	School Teacher
22	Carer (son)	31	Male	PhD Computer Science	Lecturer
23	Carer (wife)	54	Female	Bachelor (14 years of education)	School Teacher

Five broad themes and 17 subthemes were generated from the data (Figure 8).

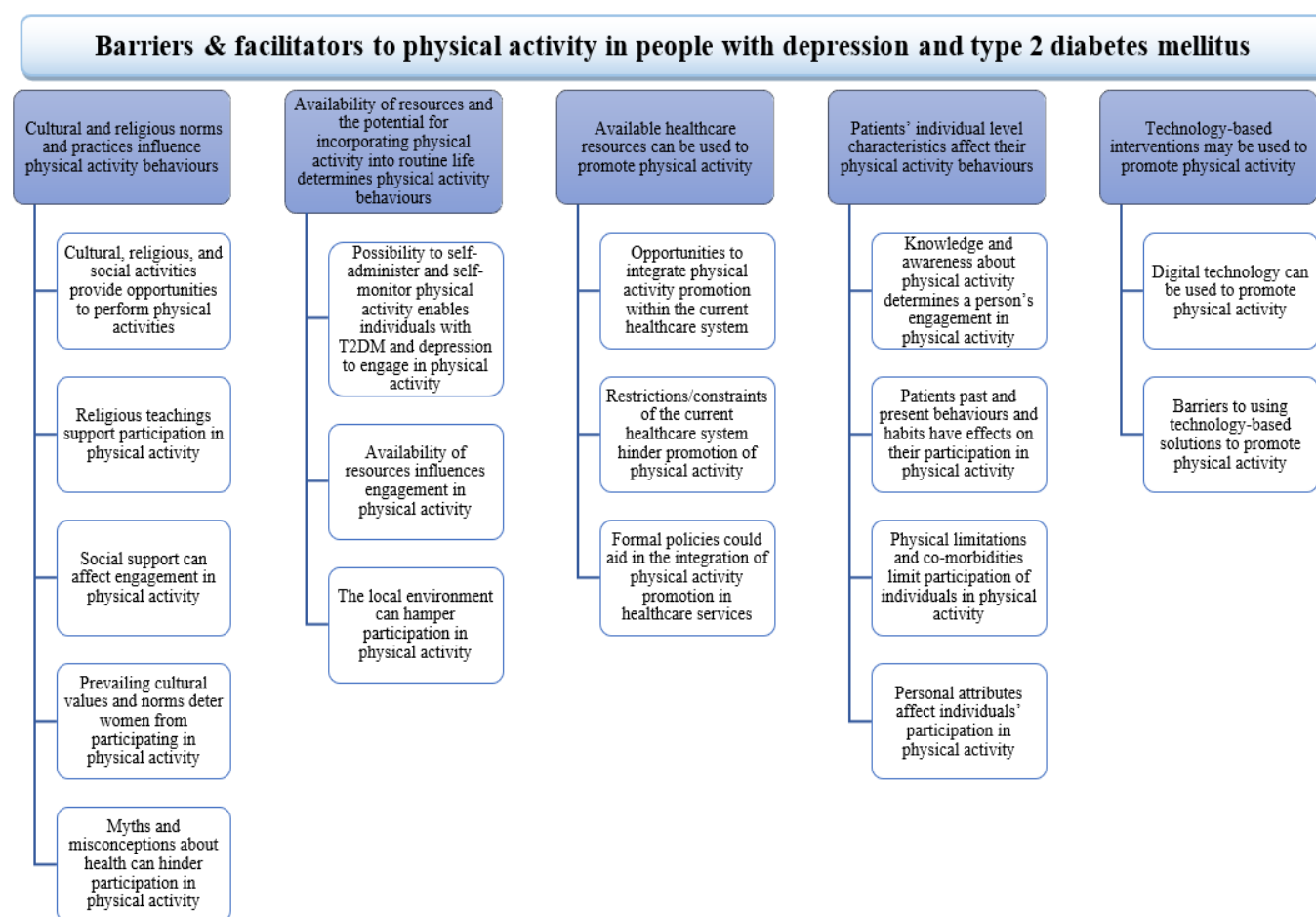


Figure 8: Themes and subthemes generated from the qualitative study data

4.4.2 Theme 1: Cultural and religious norms and practices influence physical activity behaviour

4.4.2.1 Cultural, religious, and social activities provide opportunities to perform physical activities

Participants emphasized that religious and social obligations, such as praying five times daily, social gatherings (hujra system), attachments with religious and political groups, and frequent visits to religious schools (called masjids/ madrassas) for religious sermons (dars) enabled them to perform some physical activity daily.

(I) agree, that I don't like to do anything [pause], but you know I never miss my prayers. [With a smile] This (regular praying) gives me satisfaction that at least I am doing something [long pause]. It is an exercise; do you think so, it is, no? [Patient participant, male]

One participant mentioned her daily visits to a religious school:

we (women) together go there (for religious sermons) daily to madrassa.
[Patient participant, female]

Cultural ceremonies, such as marriage, and other cultural activities, such as enquiring after a sick person and frequent visits to neighbours, friends, and relative's homes, also provided opportunities to perform physical activity. In addition, cultural dance on certain occasions also enabled people to be physically active.

I love to go to functions. Last week, my nephew had a wedding and I danced there a lot [laughing], [In enthusiastic tone], though I was not feeling well but I am always okay for dancing.....though I am ill, but I never sit at home, doing something or the other....on those events we have a lot of guests and we cook and other things late at night [with smile] and (you) know what, when I am doing all this, I do not remember that I have problems (diabetes and depression). [Patient participant, female]

4.4.2.2 Religious teachings support participation in physical activity

Participants reported that religion supported engagement in physical activity. A female participant added that a religious scholar motivated people to perform household chores, as it provides an opportunity to be physically active and a good deed as well:

No, no, I am not saying that [pause], last week when I went there (to madrassa for dars), baji (female religious scholar) says that you can win heavens, if you do khidmat (services/ household chores) in the home, you know she says that it is exercise....so, what I get from her is that we have

to do work at home with heart, it is a good deed as well as a way of (performing) physical activity. [Patient participant, female]

Participants reported that Islamic teachings and the Quran encouraged physical activity and physical fitness.

Oh, this is clear, Islam never stops you from doing something for yourself. Even it (religion) says that people should be strong (healthy).... just open the Quran and you will see that there are many places where people are guided to prepare yourself and do activities and take care of your health.... if you are doing it (physical activity) with good intention, it is (considered) a good deed. If you want to be healthy and take care of your health, you will be rewarded for that. [Patient participant, male]

4.4.2.3 Social support can affect engagement in physical activity

Support and advice from family members (spouse/ children/ siblings/ other relatives) and friends appeared to be a key facilitator for physical activity.

(It) depends how your close one (family) thinks about it (physical activity) ... take me, so my family knows it is a good thing for me, so it helps me to do it, it is not true for all of us. [Patient participant, female]

A participant mentioned support from friends:

for me, my friends' advice is always there.... they help me in all this.... if they did not, I would not be like this...they compel me to stay active. [Patient participant, male]

Participants highlighted how patients share experiences with each other, and support/advice from fellow patients with the same conditions can motivate them to be physically active.

My sister-in-law also has diabetes, she told me that the doctor told (her) that a walk is good for diabetes. [Patient participant, female]

Compliments from community members also played crucial role in motivating patients to be physically active.

Simple comments, such as you are looking smart, after exercise can help them to stay connected with it (physical activity). [Healthcare worker, male]

Negative remarks such as verbal bullying due to body size, shape, clothing, or any other reason hindered participation in physical activity.

It depends how people treat you [smile], just listen to this; once I was running in a park in chappals and one of my neighbours was there. When he sees me, he comes closer and told me with a smile, don't run in chappals, it is not appropriate and from that day onward, I never go to the park again. [Patient participant, male]

Due to strong connections with family, friends, relatives, neighbours and the community, people sometime prioritized others' opinions, concerns, and problems, instead of focusing on their own health. Thus, strong connections with others appeared to be a barrier as well.

When I look at my mother, so I can say it is not easy for women to care for themselves, they (women) have to care for their husband, their children, their relatives and husband's relatives [pause], and all the family. [Carer, male]

People perceived that physical activity is not culturally valued and that cycling or walking was considered a sign of low status and poverty. This perception can negatively affect participation in physical activity.

Imagine, if you are using a bicycle there, what others will think. [smile] At least you have to care about social status.... people's minds cannot be changed, it (culture of physical activity) can come but it takes time. [Healthcare worker, male]

4.4.2.4 Prevailing cultural values and norms deter women from participating in physical activity

The most important barrier related to culture was the stereotype of femininity. Bad experiences in public spaces, being stared at by men, the lack of available recreational spaces for women, and domestic pressures on women are some of the barriers women experience in relation to being physically active.

Ahh, I am (maybe) wrong but you cannot go to the park alone in this situation I always explained to myself that there is nothing wrong in it (going out from home) but still I am afraid what they (community) will think...you go anywhere, you will find them (male) and when they see women [laughing], (they stare so much that you will think that) they have never seen them (women) before. [Patient participant, female]

Women must wear specific clothes according to cultural norms (burqa, hijab, full coverings) if they are going outside the home, and these clothes may not be suitable for physical activity. Women living in rural areas face additional barriers as they have limited opportunities for outdoor physical activity.

We have all this there (recreational areas in village), no one will take (me) to it, you know there is strictness at home as we (female) should be at home....my husband goes to millas (local musical concert), (but) they do not allow women to go to it.... they (male) can do anything, but not me. [Patient participant, female]

4.4.2.5 Myths and misconceptions about health can hinder participation in physical activity

Participants emphasized that some people in Pakistan think that mental health issues, such as depression, may be due to supernatural powers or magic, leading to people with mental health issues being confined to their homes.

Personally, I have seen people who believe that mental health issues are caused by jinnat (demon/elves) or some other things (supernatural powers) or magic or taweez (amulet/mascot) just tell me [long pause] how you

will tell them about these things (physical activity/exercises) if they are not taking (understanding) their condition (mental health issues). [Healthcare worker, female]

Similarly, it is commonly believed that mental health issues and diabetes are worsened by physical activity.

Sometimes I want to do (perform) it (physical activity) and go out (of home) and go to the market and [long pause] do what I did before (in the past before they were ill), people say no take rest as it (doing physical activity) can worsen your condition (diabetes and depression) [Patient participant, female]

4.4.3 Theme 2: Availability of resources and the potential for incorporating physical activity into routine life determines level of physical activity

4.4.3.1 Possibility to self-administer and self-monitor physical activity enables individuals with depression and T2DM to engage in physical activity

Participants discussed the possibility of incorporating physical activity into routine activities, such as routine duty work (profession), household chores and other activities (social, religious, domestic activities). Participants also mentioned the possibility of performing physical activities through pleasurable activities, such as playing with children, having fun with family members, and other recreational and leisure activities.

(I think) to do it (physical activity) is not that different [pause], you do things (anything), it is exercise.....going to work is exercise, walking to market is it, everything can (provide the opportunity to do) it (exercise). [Patient participant, male]

A female participant described her pleasurable activity as:

Let me tell you something interesting, I have grandchildren at homes, and I always play with them, isn't this enough exercise for me (because) when I play with them, I feel very much relaxed. [Patient participant, female]

Physical activity can be carried out independently, without any supervision, with a flexible physical activity schedule, which can help facilitate physical activity for people with depression and T2DM.

I like it (physical activity) as I can do it anytime, in (my) home, in (my) office It is not necessary to have that many instruments (devices), simply walk and walk and walk, it is exercise, you can do it (physical activity) without any thing. [Patient participant, male]

The possibility to monitor and grade physical activity, either with the help of a mobile app/self-help workbook/diary or with the help of traditional methods like counting tasbeeh (string of beads/ rosary) or noting time was highlighted by the participants.

I (have my) own way to monitor it (physical activity). You know, what I do, I count tasbeeh, when I walk, so it gives me the sense (idea) that how much I do it (walk/physical activity) so, if (you) ask me, I will say it is easy to count (monitor) it (physical activity) because you can do it without anything (device). [Patient participant, female]

Participants also discussed the possibility of providing personalized physical activity protocols i.e., physical activity appropriate for different fitness levels and physical limitations.

So simple is that if you provide personalised treatment, it works more, it is not rocket science because you can (suggest) activities that are appropriate for their (patients) individual needs and preferences. [Healthcare worker, female]

4.4.3.2 Availability of resources influences engagement in physical activity

It appeared that resources (equipment, sportswear, facilities) required for physical activity are expensive, unavailable, or inaccessible.

We all know that patients do not have access to resources [pause] (and) if there are no proper equipment or resources needed for (specific) exercises,

then how can we tell them (patients) to perform exercises. [Healthcare worker, female]

Nonetheless, participants highlighted that available resources/places for physical activity in urban and rural areas can be used for physical activity. For example, in urban areas, public parks, jogging tracks, gyms and swimming pools are available, some of which are specified for female use only.

It depends on how people find ways (resources for physical activity), [pause] there is a female park near our home, but my heart says not to go there but sometimes I go there and sometimes sit there or walk there. [Patient participant, female]

In rural areas, availability of natural resources like hills, farms and lakes/ canals/ creeks/ streams can help them perform physical activity.

I am always doing something in the village, go with friends to a nearby hill in the evening.... there is a canal in our village, so I go with them (friends) in the afternoon.... look, I work on the farms, and I take care of cattle, so I am busy with them (with cattle) all day, so this is what I am doing. [Patient participant, male]

Houses are large in villages, which can help increase physical activity within the home.

We don't live in small houses like you [pause], we have large houses (with more open areas) in the village...just going (moving) from one side to other takes a long time. [Carer, female]

Lack of a proper public transport system in rural areas appeared to be a facilitator to physical activity because people must walk if they cannot find public transport.

If I am travelling in the morning from the village, I have to walk 30 to 40 minutes to reach the bus stop because you cannot find a vehicle there. [Patient participant, male]

4.4.3.3 The local environment can hamper participation in physical activity

High crime rates, limited availability of security personnel, fear of violence and stray dogs can hamper participation in physical activity.

(I) tell you something, [pause] I used to go to the gym almost 5 years (ago).... when I came out (from the gym), two men snatched my mobile.... well, that day and today, I never go there again. [Healthcare worker, male]

In Pakistan, there is extreme heat in the summer season, leading to people avoiding physical activity in the summer season.

Oops, so do you want me to run in this (hot) weather, well, I am never ready for it. [Patient participant, male]

4.4.4 Theme 3: Available healthcare resources can be used to promote physical activity

4.4.4.1 Opportunities to integrate physical activity promotion within the current healthcare system

Participants discussed the possibility of delivering physical activity interventions in the current healthcare system by training the existing healthcare force.

Why not, it is possible to do it here (in the existing healthcare system), you know it is already used but by providing training and support to them (healthcare workers), it can be brought into action. [Healthcare worker, female]

An important facilitator highlighted by the participants was that healthcare workers have autonomy to advise/prescribe physical activity.

The good thing is that the doctor is free (autonomous), if we do it (advise/prescribe physical activity), no one will ask us why we do that, they will even say it is good (doing a great job). [Healthcare worker, male]

Participants suggested that advice and/or prescriptions for physical activity, by the treating physician, is a facilitator to engaging in physical activity, because patients remember and follow advice/prescriptions from doctors during consultation.

When you say, physical activity is told (advised/prescribe) by the doctor, it means a lot, whenever a doctor says anything, I do what he suggests, you can say (ask) why (I follow the doctors' advice) but because he knows everything about me (my disease condition) ... even if he told me to run for a while, I cannot ignore that. [Patient participant, male]

Healthcare workers act as role models for patients and patients may try to adopt healthy lifestyle behaviours due to the lifestyle, personality, and habits of healthcare workers.

Sometimes when I see them (female doctors and nurses) and they are so much more active and (they are) running in the hospital, I say they are also (humans) like me, so why can I not be (so active) like them? [Patient participant, female]

Lack of proper training of healthcare workers about physical activity appeared to be a barrier to providing advice and/or prescribe physical activity in clinical set-ups.

Just do a simple survey and ask them (medical doctors/healthcare professionals) how much knowledge they have about it (physical activity), and you will be surprised that most of them don't have (the required knowledge or skill) to advise or prescribe it. [Healthcare worker, female]

The availability of materials/brochures/ study materials in healthcare facilities explaining the concepts of physical activity can be helpful to spread awareness about the importance of physical activity among patients and their carers. In addition, participants discussed that patients with diabetes frequently visit diabetes specialists, so patients can be educated about physical activity either at their diabetes clinic or they can be referred to a physical activity specialist.

Personally, (I have) one visit a month, but there is no information about exercise, which means you can say, it's simple, they (may) put some

material (leaflets) with related information here (referring to the counter) and when we are waiting for the doctor, it can be studied.... It's easy, if someone cannot read, a helper can help talk about it. [Patient participant, male]

4.4.4.2 Restrictions/constraints of the current healthcare system hinder promotion of physical activity

Participants highlighted the challenges of communication between healthcare professionals and the lack of proper referral mechanisms in the current healthcare system. In addition, participants emphasized that dedicated staff for prescribing physical activity in healthcare centres are not available.

So, you tell me who is responsible for that (to advise/prescribe physical activity to patients) here (in hospital), if you know, also tell me.... they (patients) come there (to diabetes OPD), so I cannot go there and catch him by the arm and say do this and do this. [Healthcare worker, male]

Provision of proper guidance about physical activity is time consuming and healthcare workers don't have enough time to properly advise or prescribe physical activity in clinical settings.

Exactly, how much time will it take to assess current (levels of) physical activity, then make a plan for him (patient), in this much time, (I can) assess many patients, as it is not possible to do it properly. [Healthcare worker, female]

Lack of organizational and management support, unmanageable patient burden and workforce shortages appeared to be barriers to the promotion of physical activity in the healthcare system.

Here we don't have time within patient consultations, we check more than 250 patients in a day in OPD and if, say, (it) takes 1 minute (to advise/prescribe) about physical activity, [long pause] we need extra hours for it, will you pay for that extra time? [Healthcare worker, male]

4.4.4.3 Formal policies could aid in the integration of physical activity promotion in healthcare services

It appeared that physical activity is not considered a priority in existing healthcare systems and there is a lack of effective supportive policies for physical activity.

It (physical activity) is not considered a priority in our healthcare system, just tell me if the Govt. have allocated anything for prevention....how it works is difficult to imagine, look, if we don't have any policy, you see, it is not possible to even think about it and if ever they (government) give (formulate) some (policy), who will implement it? I cannot see any (mechanism) here that we trust to be useful (for implementing policies).
[Healthcare worker, male]

Currently, there are no policies or initiatives to assess or prescribe physical activity in clinical settings.

The concept that exercise is medicine is new here (in Pakistan) [pause] but you know one day you will have policy on it to properly prescribe it (physical activity) to patients, but it will take some time. [Healthcare worker, male]

4.4.5 Theme 4: Patients' individual level characteristics affect their physical activity behaviours

4.4.5.1 Knowledge and awareness about physical activity determines a person's engagement in physical activity

Awareness about the benefits of physical activity is a facilitator:

Why I love it (physical activity), you see, I want to look smart...my son also told me that walking can help reduce it (referring to belly) and improve my mind. [Patient participant, female]

Compared to medication, participants preferred physical activity as it is cost-effective and has no side effects.

If you tell me that this (physical activity) can help me (in managing) my sugar and other things and my mood, then why would I, [smile] lose my money on

tablets, and it (physical activity) doesn't have side effects. [Patient participant, male]

4.4.5.2 Patients past and present behaviours and habits have effects on their participation in physical activity

Patients' motivation, habits, behaviours, diet, and sleep routines play an important role in engaging them in physical activity.

Let me give an example, so if patients walk to their appointments or to the store, they will be more likely to be healthy and active than those who drive everywhere. [Healthcare worker, male]

Previous positive experiences with physical activity can boost a person's motivation to perform physical activity.

It is true, I go to the park with him (son) and stay there for a while, it automatically affects my mood... so with time I tell you that it (physical activity) can have a positive effect on my low mood. [Patient participant, female]

The will to recover previous physical fitness appeared to be a facilitator.

(Before diabetes), I did many things and was active [pause], do not look at me now [laughing] I was so slim and active. (I) want to (be) like that (again). [Patient participant, female]

However, patients with certain personality characteristics may be reluctant to perform physical activity in front of others.

I am sure that you have the idea that we each have different personality traits, so how would someone recommend it (physical activity) to an introvert....my experience says you can never convince him just by simple advice.....so simply saying that many successful players are introverts is not enough because your patient population is totally different.....what I want

to convey is that patients with certain characteristics may be difficult to accept it (physical activity). [Healthcare worker, female]

4.4.5.3 Physical limitations and co-morbidities limit participation of individuals in physical activity

Severity of depression and T2DM is a major barrier to physical activity.

(It) needs to be known (emphasized) that self-care works up to some level, now if a patient is severely depressed [pause], or he has uncontrolled sugar and he is bed ridden, so how you can tell him about self-care and physical activity. [Healthcare worker, female]

Physical symptoms such as pain and comorbidities can impede participation in physical activity.

I (have) sugar, I also have knee pain, also have (low) mood (depression), also have gas (stomach problems), [long pause] if I continue, there is a long list, (still) you say do exercise.... I cannot move myself, so how I run in the parks.... once I am completely okay (cured), then I will start exercises. [Patient participant, male]

Lack of confidence in performing physical activity due to fear of falls/ injury restricts patients' participation in physical activity.

You will laugh at me, but I avoid it (physical activity) because I am afraid of it.... sometimes I think that if I do it, my bones will be broken (fractured) [Patient participant, female]

4.4.5.4 Personal attributes affect individuals' participation in physical activity

Low socioeconomic status/ poverty, low literacy, having a private car/vehicle, and marital status were some of the points highlighted by participants that might impede participants from performing regular physical activity.

I am sure you have an idea about how difficult it is to explain something to illiterate patients, and it becomes even more difficult when they are not interested in it. [Healthcare worker, male]

Workload, extended duty hours, shift duty, working in the private sector, social and family commitments and other responsibilities were some of the reasons mentioned by the participants as to why they could not find time to be physically active.

One of the biggest challenges I face when it comes to exercise is finding the time to do it... the confusion is whether I should earn or focus on myself. It is easy to, say, find time for yourself but, it would not work. [Patient participant, male]

4.4.6 Theme 5: Technology-based interventions may be used to promote physical activity

4.4.6.1 Digital technology can be used to promote physical activity

Mobile apps, websites, social media, and YouTube are facilitators for increasing physical activity because they can assist in learning about different physical activities.

No need for any teacher (coach), a mobile can be your teacher, search (exercises) and do as they do (teach). [Patient participant, male]

Mobile apps and websites can be used to track physical activity levels, assess progress, set goals, and schedule physical activity.

(I) also note how many steps I take on a daily basis on this (using mobile app) ... So, I say, I will take 10000 steps and I walk and walk to complete it...good thing is it tells me (gives reminder) when I am not doing it. [Patient participant, male]

Media campaigns can spread awareness about the benefits of physical activity. In addition, exercise classes on television can guide patients on how to do specific exercises. Furthermore, mass media can be used to eradicate myths about mental health and physical activity.

Some time ago there was something, a movie, or some other thing which I saw, in which a doctor told people to walk while talking on a mobile, [pause] it means that doctor told people (that) when talking on a mobile, walk with that and then his idea is spread throughout the area, and everyone starts walking and then they show in it that diseases are reduced. [With a smile] so I want to say that such kinds of things (mass media campaigns/dramas/movies) can help in spreading awareness (about physical activity). [Carer, male]

Electronic devices are also facilitators for physical activity because they can be used for physical activity monitoring (e.g., pedometers) and can be used to perform a physical activity directly (e.g., treadmills).

So, what else, electronic devices can be used for it (to monitor physical activity), such as pedometers can be used to track activity, it can also help to motivate them (patients) to be more active. It (devices) can encourage them (patients) to do more and more exercises. [Healthcare worker, female]

In addition, participants mentioned how electronic video games and virtual reality can be used to motivate patients to engage in physical activity.

Now, people do exercises with the help of video games and that 3D motions (virtual reality), not to (go) outside (of the) home. [Healthcare worker, male]

4.4.6.2 Barriers to using technology-based solutions to promote physical activity

Difficulties in understanding instructions and options, particularly by patients with literacy difficulties, limit the use of technology-based solutions.

Simply because [long pause], people have difficulties when trying to use devices (related to physical activity) ...they (patients) cannot use a device that they do not understand. [Healthcare worker, female]

Poor internet connectivity, particularly in rural areas, appeared to be a barrier to promoting physical activity through technology-based solutions.

When I am there (in the village), their internet is not working properly, and I cannot note it (physical activity in mobile app). [Patient participant, male]

Resources required for technology-based solutions/interventions are expensive, unavailable, or inaccessible.

But you have to think about it from our perspective, these things (devices for performing or monitoring physical activity) are expensive [pause], it can be used, but not for all (patients). [Healthcare worker, male]

4.5 Discussion

Numerous individual, healthcare and wider cultural and environmental-level facilitators and barriers influence physical activity in people with depression and T2DM in Pakistan. These included cultural and religious norms and availability of resources, such as public spaces for physical activity. Individual characteristics e.g., knowledge and awareness of physical activity, physical limitations and co-morbidities, and domestic and occupational responsibilities were also thought to determine engagement in physical activity. Moreover, participants suggested that available healthcare resources and emerging technology-based solutions and interventions could be better utilised to promote physical activity.

Despite the well-established health benefits of physical activity, people with depression and T2DM do not generally reach recommended levels of physical activity. The findings of current study support those reported in previous studies and also provide additional insights into factors that may influence physical activity. Evidence suggests that a myriad of factors affect participation in physical activity and, therefore, facilitators and barriers to promoting physical activity vary for individuals, societies, and cultures (Elshahat et al., 2020). Numerous studies have attempted to identify these facilitators and barriers, but the majority have been conducted in high-resource settings. The few studies conducted in LMICs have primarily focused on physical activity promotion in the general population (Banavali et al., 2021, Hoodbhoy et al., 2018, Raskind et al., 2020). The current study is

one of the first to report the potential facilitators and barriers to physical activity promotion in people with depression and T2DM in an LMIC, specifically Pakistan.

The findings suggest that religious obligations and activities, such as praying five times a day, provide an opportunity to perform regular low-intensity physical activity. The different postures and positions (standing, bowing, prostration, and sitting) adopted during Muslim prayer involve movements of all body parts at regular intervals. Prayers may also provide benefits associated with spirituality and may improve mental and physical health through additional mechanisms. In addition, it was found that religious scholars encourage people to perform physical activity. The finding that religiosity has a positive influence on engagement with physical activity is again consistent with the published literature. A review that assessed cultural factors associated with physical activity in people living in the United States of America reported that religious teachings and attachments, spirituality, and belief in God promote physical activity (Mathew Joseph et al., 2018). Some individual studies also support the notion that religion helps promote physical activity (Shuval et al., 2008, Rubio-Rico et al., 2021, Aljayyousi et al., 2019).

Cultural and social activities also provide an opportunity to perform physical activity. Although cultural norms were supportive of physical activity from men's perspectives, it appeared that they deterred women's participation in physical activity. There are consistent reports in the literature highlighting low levels of physical activity among women (Rosselli et al., 2020, Sharara et al., 2018); studies suggest that the economic status of the family is the main factor that determines involvement of women in physical activity, while culture is listed as a secondary factor (Laar et al., 2019, Walseth and Strandbu, 2014, Tekin, 2010, Erdogan et al., 2010). Nonetheless, the current study showed that cultural values may be a major barrier for women. Although religion, particularly in Muslim countries, is often considered a barrier to physical activity promotion in women, participants in the current study reported that it is not religion, rather it is the cultural codes that restrict women's participation. The finding that culture is supportive of physical activity for men but not for women is consistent with previous studies (Raskind et al., 2020, Aljayyousi et al., 2019, Shuval et al., 2008).

Limited resources may not preclude promotion of physical activity. Participants in current study highlighted that physical activity may be carried out even in resource-limited settings, as it does not always require specific resources and can be performed without supervision. Moreover, they reported that physical activity can be easily incorporated into everyday routine activities including domestic, occupational, and recreational activities. Previous studies have also reported that routine daily activities can provide the opportunity to perform physical activity (Arshad et al., 2016, Pasquarella et al., 2022). Similarly, studies have reported that household chores are the main source of physical activity among women (Hoodbhoy et al., 2018, Raskind et al., 2020, Banavali et al., 2021). A study conducted in India reported that adolescent girls and boys had almost the same levels of physical activity, but girls spent most of their active time in completing household chores and work, while boys spent most of their active time playing (Raskind et al., 2020). A study conducted in Pakistan also reported that household chores were the predominant source of physical activity among pregnant women (Hoodbhoy et al., 2018). Likewise, a qualitative study conducted in rural parts of India emphasized that there is a scarcity of opportunities for performing recreational physical activity in rural areas and that household chores and walking long distances are the major sources of physical activity (Banavali et al., 2021).

There is evidence that low-intensity physical activity is effective in managing depressive symptoms (Arsh et al., 2023a, de Groot et al., 2019, Chang et al., 2019). Reports also suggest that low-intensity leisure and work-related physical activity confer mental health benefits (Teychenne et al., 2020); however, we were unable to locate any high-quality evidence that supports the effectiveness of household chores and daily routine activities either in the management of depression or T2DM. Nevertheless, these activities appear promising for promoting physical activity in this population by incorporating it into people's daily routine.

The findings of this current study suggest that healthcare workers and the healthcare system can play an important role in promoting physical activity. Nonetheless, it appeared

that currently, physical activity promotion is not prioritised in the healthcare system and despite the evidence supporting its widespread clinical use, physical activity is still underutilized as an established treatment modality. We found that healthcare professionals do not routinely discuss physical activity with their patients and the few who discuss it, provide very brief, non-specific advice using verbal counselling. This barrier is not specific to Pakistan, because studies from other LMICs, and even from some high-income countries, report that unlike medication, which is prescribed in written form, clinicians do not regularly assess or prescribe physical activity in routine care (Nauta et al., 2022, Brannan et al., 2019, Hagströmer et al., 2022). Thus, the challenge remains to translate knowledge of the health benefits of physical activity to practical use in the healthcare system (Brannan et al., 2019). Healthcare professionals can play an important role in the dissemination of physical activity recommendations to a broad segment of the population; however, this can only be possible if clinicians provide written prescriptions for physical activity (Linke et al., 2021, Nauta et al., 2022). The relatively new concept of 'Exercise is medicine' implies that just as for prescriptions of medication, guidance about physical activity should be provided by a health care professional in a structured way, resulting in an individualized prescription for activity in written form, tailored to the person's needs (Thompson et al., 2020, Alessy et al., 2023). Prescription of physical activity by the treating physician or other healthcare professional could be one approach to promoting physical activity, in addition to the other evidence-based approaches and initiatives that can assist in the promotion of physical activity, such as social support interventions, behavioural and educational interventions and enabling environment initiatives (Alessy et al., 2023, Taylor et al., 2021, Gelius et al., 2020). For example, evidence supports the use of motivational interviewing, a counselling approach, for the promotion of physical activity (O'Halloran et al., 2014).

4.5.1 Limitations

The current study has some limitations. We did not explore the perspectives of policymakers; thus, we were unable to report on facilitators and barriers at a policy level. Although healthcare workers discussed the important role of policy in the promotion of physical activity, they were uncertain about policy-relevant facilitators and barriers or any

government initiatives to promote physical activity in the country. In addition, it is difficult to determine how broadly transferable the findings of the current study are because the study was restricted to a single district and participants were all of Pashtun ethnicity. Nevertheless, the study has provided insights that could be largely applicable to people residing in other regions of Pakistan. Moreover, Pashtun ethnicity is the predominant ethnic group in Afghanistan where they have the same religious practices and cultural norms, so the findings may be applicable there as well. Furthermore, the findings may be transferable to other LMICs, particularly those in South Asia because LMICs often face similar challenges to the promotion of physical activity.

4.5.2 Implications

The findings of this study can be used as an initial step in the development of a comprehensive, sustainable, and culturally tailored intervention to promote physical activity in this population. This study suggests that due to cultural values, women face significant barriers to physical activity compared to their male counterparts. It is imperative therefore to develop an intervention to promote physical activity tailored to women, which will help in reducing gender disparities. Moreover, this study suggests that religious and cultural activities such as praying five times a day, visiting religious schools, attachments with religious groups, participation in cultural events, and cultural dance can be used to promote physical activity in people with depression and T2DM. Similarly, the findings emphasized that patients generally follow instructions of healthcare workers and therefore if these patients are properly guided about physical activity in healthcare settings, it may improve uptake of physical activity. Nonetheless, the lack of proper training for healthcare workers about physical activity appeared to be a barrier to advising on, and/or prescribing, physical activity in clinical settings. Therefore, healthcare workers need to be appropriately trained. There is also a need to explore emerging technologies for the promotion of physical activity in this country, despite some barriers to their use in some sections of the population.

4.6 Conclusion

Individual, cultural, and healthcare system level barriers and facilitators can affect participation of people with depression and T2DM in physical activity. These barriers and facilitators should be considered in designing interventions to promote physical activity in this population. It appears that physical activity could be promoted in this population by focusing on available resources while keeping in mind economic, individual, cultural, and social barriers, and by incorporating physical activity into everyday activities (including religious, social, cultural, domestic, occupational, and recreational activities), tailoring them to individual characteristics, using technology and harnessing routinely available healthcare resources.

Additional considerations related to the qualitative study

4.7 Methodological considerations

4.7.1 Study Protocol

I developed the study protocol under the supervision of PhD supervisors. For ethics approval, the protocol was submitted to Health Sciences Research Governance Committee University of York United Kingdom and Ethics Board of Khyber Medical University Pakistan.

4.7.2 Inclusion and exclusion criteria for participants

In this qualitative study, patient-participants (individuals with depression and T2DM), carers and healthcare staff were included. The purpose of including participants from these three different populations was to capture a wide range of views and opinions regarding enablers and constraints to physical activity. Adult participants, aged ≥ 18 years were included. In Pakistan, people aged 18 years or above are considered as adults and are considered as capable of decision making. Although there are no specific guidelines in the country regarding the age at which people can provide consent for participation in the research studies, generally adults with 18 years or above are considered to have capacity to provide consent for participation in research studies.

4.7.3 Identification of participants

We used separate pathways for identification of each group of participants (patient-participants, carers and healthcare staff). Similarly, separate information sheets were developed for each group of participants. Patients were identified with the help of healthcare staff while carers were identified with the help of healthcare staff and patients participating in the study. Healthcare staff were invited to the study by distributing leaflets and participant information sheets among healthcare workers.

4.7.4 Interviews from participants

For the qualitative study, I conducted individual interviews. I had three groups of participants (patient-participants, carers, and healthcare staff) and I considered it would

be difficult to balance power dynamics during focus group discussions, therefore individual interviews were more appropriate than focus groups. Several studies have highlighted the issues related to balancing power dynamics during focus group discussions when dealing with different groups of participants (Sim and Waterfield, 2019, Parker and Tritter, 2006). Due to logistics, financial and time constraints, it was not possible to have separate focus group sessions with each group of participants. I opted for a semi-structured interview approach as I was interested in gaining in-depth insights from the participants, however, at the same time I wanted to cover the key points as per the objectives of the study (Chauhan, 2022, Low et al., 2019). Separate topic guides were developed for each group of participants. I developed the initial topic guides and refined them based on suggestions from PhD supervisors and members of thesis advisory panel. After finalization, they were translated to Urdu. The topic guides were further refined after conducting three pilot interviews (one patient-participant, one healthcare staff and one carer).

4.7.5 Qualitative data analysis

I opted for using thematic analysis to find meaning-based patterns within the interviews. Thematic analysis was described by Braun and Clarke and is one of the most commonly used approaches to qualitative data analysis in health sciences (Braun and Clarke, 2006, Braun and Clarke, 2023a). Veteran qualitative researchers often favour established methodologies such as interpretative phenomenological analysis and grounded theory (GT) (Cuthbertson et al., 2020). They claim that these established methodologies are more aligned with the philosophical tenets of qualitative research (Clarke and Braun, 2013). The theoretically flexible position of thematic approach in the landscape of qualitative research is well-established. However, evidence suggests that there is the possibility of considerable overlap in the output from pattern-based approaches (Braun and Clarke, 2021, O’Kane et al., 2021, Braun and Clarke, 2023b). For example, a study that applied interpretative phenomenological analysis and thematic analysis on the same dataset of interviews suggested that the final output did not have many differences, however, authors reported that results from thematic analysis offered breadth while

results from interpretative phenomenological analysis offered depth (Spiers and Riley, 2019).

There is significant debate regarding the application of specific approaches for conducting qualitative analysis, however, Braun & Clarke (2021) published recommendations for when to use thematic analysis over interpretative phenomenological analysis or grounded theory (Braun and Clarke, 2021). They recommend using thematic analysis instead of interpretative phenomenological analysis if one or more of the following apply:

- The sample is relatively large (i.e., greater than 10).
- The analytic focus is only on the identification of themes in the data sets.
- Research aims to have “actionable outcomes” with clear implications for practice.

On the other hand, they recommend using interpretative phenomenological analysis if there is a small sample size and the research interest is more inclined towards understanding lived experiences of the participants rather than how individual experiences are placed within broader socio-cultural contexts. Based on these recommendations, I considered thematic analysis was more appropriate for the current qualitative study than interpretative phenomenological analysis because the research study met the assumptions for using thematic approach instead of interpretative phenomenological analysis.

In addition, Braun & Clarke (2021) recommend using thematic analysis instead of grounded theory if one or more of the following apply:

- The study does not aim to develop a grounded theory and is only interested in finding patterns in the data.
- There are time constraints (thematic analysis can be quicker than a full-fledged grounded theory research project)

As the aim of the qualitative study was not to develop a grounded theory but was instead to understand the facilitators and barriers to physical activity, thematic analysis was the most appropriate approach for current study.

4.7.6 Reporting and dissemination

Reports of the qualitative research study were prepared according to consolidated criteria for reporting qualitative research (COREQ) checklist. The study was published in a peer reviewed journal (Arsh et al., 2023b).

4.8 Ethical considerations

4.8.1 General considerations

The study involved human participants and raised a number of ethical considerations, including the requirements of independent ethics committee approval, the need to obtain informed consent, data confidentiality and maintaining data security.

4.8.1.1 Ethical approval

Ethics approval was obtained from the Health Sciences Research Governance Committee University of York United Kingdom. Locally, ethics approval was obtained from Ethics Board of Khyber Medical University Pakistan.

4.8.1.2 Informed consent

Information sheets and consent forms were provided in Urdu language. Purpose of the study and other relevant information were conveyed in local language. Where literacy levels allow, participants studied the information sheet by themselves. Otherwise, I read out the study information sheets, and consent forms to convey the information to participants. Depending on literacy levels, participants provided either thumbprints or signatures to confirm written informed consent.

4.8.1.3 Privacy and confidentiality

Interviews were conducted in a space which provided privacy. All data collected during the research was treated as confidential. All identifiable information from the collected

data was removed. To ensure that no individual could be identified in the study results, the contents which could potentially disclose participants identities were erased from the transcripts. Paper, as well as electronic records, were stored safely and securely. Interviews were recorded on encrypted audio recording devices. The data collected in hard form was kept in a locked cupboard kept in locked rooms, within locked areas at Khyber Medical University Peshawar. Electronic data was password-protected and was held on a secure computer.

4.8.2 Special considerations for dealing people with depression and type 2 diabetes mellitus

The qualitative study included people with depression and T2DM. These patient-participants might be considered a vulnerable population, therefore additional safeguards for the protection of rights and welfare of patient-participants were taken.

- There was a possibility that patient-participants might face issues in the consent process due to inability to process the provided information adequately. To overcome this issue, participant information sheets and consent forms were provided and explained in language that was understandable by the participants. I strived to improve decision-making capacity of participants, by providing repeated information related to the research study. However, patients were not eligible for participation if they did not have the capacity to consent.
- There was a possibility that the participants might become distressed whilst discussing their experiences during the interview. Following measures were taken to minimize the potential impact of distress;
 - Before starting the interview, I (being the interviewer) guided the participants to stop the interview at any time, if they felt distressed during the interview.
 - Participants were encouraged to inform me if they need support during the interview.
 - I stopped the interview if I noticed any non-verbal signs of distress or reluctance to continue. I allowed the participants to compose themselves

and explain their concerns if they wished. I asked the participant whether they wished to continue with the interview or not.

- Before recommencing the interview (if the participant agreed to re-continue), I asked about any additional support needed.
- The topic guides for the current study did not contain questions/prompts that could directly elicit information requiring disclosure. However, there was a possibility of disclosures of this nature, therefore before starting the interview, I ensured that the participants had read and understood the participant information sheet and were aware of the situation where a breach of confidentiality and onward reporting might be required.

4.9 The way forward

The qualitative study reported a wide range of individual, cultural, and healthcare system level barriers that can affect participation of people with depression and T2DM in physical activity. The study emphasized that due to prevailing cultural norms and stereotypes associated with femininity, women face additional barriers to being physically active compared to men. Due to these additional barriers, women participation in physical activity might be more challenging and thus the health benefits of physical activity interventions might be less prominent in women. This interpretation was reinforced by the findings of systematic review presented in the previous chapter which reported that physical activity was not effective for managing depressive symptoms in women with T2DM (Chapter 3 (Arsh et al., 2023a)), with a potential explanation that this was due to limited uptake. The additional barriers identified in this qualitative study might explain the reasons for the limited uptake of physical activity in this population.

Based on the above discussion, it was imperative to devise strategies to promote physical activity among women with depression and T2DM. The qualitative study reported that physical activity could be promoted in this population by focusing on available resources and by incorporating physical activity into everyday activities (including religious, social, cultural, domestic, occupational, and recreational activities). This highlighted the need for

culturally appropriate physical activity interventions for women with depression and T2DM. Informed by findings from this qualitative study and the systematic review described in the previous chapter, consultative workshops were conducted to adapt an integrated BA and physical activity intervention for women with depression and T2DM living in Pakistan. The detailed rationale, methods and findings are presented in the next chapter of this thesis.

Chapter 5: A study to adapt an integrated Behavioural Activation and physical activity intervention for women with depression and type 2 diabetes mellitus in Pakistan

This study is not published yet, but it has been prepared according to the journal article format as I plan to submit it to a peer reviewed journal “Mental Health and Physical Activity” for publication.

Arsh, A., Afaq, S., Carswell, C. & Siddiqi, N. (2024). Adaptation of an integrated Behavioural Activation and physical activity intervention for women with depression and type 2 diabetes mellitus in Pakistan. [Unpublished Manuscript]

Role of each author is described in the preface (Page 15-17). The study has been presented at the Primary Care Diabetes Association (PCDA) Symposium held at MoveNPick Hotel Karachi Pakistan on 17-18th February 2024.

This chapter describes a study that adapted an integrated BA and physical activity intervention to tailor it for women with depression and T2DM living in Pakistan. The main components of the research study (abstract, introduction, methods, results, discussion, and conclusion) are presented in sections 5.1 to 5.6. Additional considerations (methodological and ethical considerations) related to the study are presented in section 5.7 and 5.8.

Adaptation of an integrated Behavioural Activation and physical activity intervention for women with depression and type 2 diabetes mellitus in Pakistan

5.1 Abstract

Background: Integrated BA and physical activity interventions (BACPAc) have the potential to tackle depression and T2DM multimorbidity. However, such interventions, developed in high-income countries, may need to be adapted and contextualized to be appropriate for use in LMICs. The objective of this study was to adapt a BACPAc intervention to tailor it for women with depression and T2DM living in Pakistan.

Methods: Two consultative workshops with key stakeholders (people with depression and T2DM, carers, healthcare workers, and social workers) were conducted. The purpose of workshop 1 was to identify facilitators and barriers to the delivery of the original BACPAc intervention as per the domains of the Bernal cultural adaptation framework (language, persons, metaphors, content, concepts, goals, methods, context). Based on the findings of workshop 1, changes were made to the original intervention. Stirman's adaptation classification was used to map the changes. In workshop 2, participants' feedback was used to refine and finalise the contents of the adapted intervention.

Results: A total of 21 participants attended workshop 1, while 16 participants attended workshop 2. Barriers and enablers were identified in all domains of the Bernal's framework. Changes were made in the language, pictures/illustrations, intervention dose and delivery, training intensity, and evaluation measures.

Conclusion: This study produced a theoretically informed, culturally adapted BACPAc intervention for women with depression and T2DM living in Pakistan.

5.2 Introduction

Depression and T2DM multimorbidity is highly prevalent as 14.5% to 28% of people with T2DM suffer from depression (Farooqi et al., 2022, Khaledi et al., 2019, Wang et al., 2019). Evidence suggests that women with T2DM have a higher prevalence of depression compared to their male counterparts (Barbosa et al., 2022, Pan et al., 2010). The prevalence of depression among women with T2DM ranges from 24% to 34%, while its prevalence among men ranges from 15.8% to 23% (Farooqi et al., 2022, Khaledi et al., 2019, Wang et al., 2019). In LMICs, although the prevalence of depression among women with T2DM has not been studied, it is reported that estimates of depression prevalence might be considerably higher in this population (Mendenhall and Weaver, 2014).

Physical activity has been shown to not only improve glycaemic control but also to be effective in managing depression (Kandola et al., 2019, Narita et al., 2019, van der Feltz-Cornelis et al., 2021). However, women with depression and T2DM mostly remain physically inactive (Koopmans et al., 2009, Lee et al., 2020). This is a particular challenge in Pakistan where due to cultural values, women face additional barriers to physical activity compared to men (Chapter 4 (Arsh et al., 2023b)). According to conservative estimates, 27% to 80% of women in Pakistan are physically inactive (Hoodbhoy et al., 2018, Samir et al., 2011, Pengpid et al., 2015, Memon et al., 2018, Guthold et al., 2008, Mawani, 2017). While the statistics regarding physical inactivity among women with T2DM and depression living in Pakistan are not available, it is likely that physical inactivity is significantly higher in this population compared to the level of physical inactivity observed in the general population.

Literature suggests that the use of rewarding activities can improve people's motivation and compliance to adhere to specific exercise protocols (Bullard et al., 2019). BA is based on identifying and engaging in rewarding activities to improve symptoms of depression (Janssen et al., 2021, Turner and Leach, 2012). While increasing daily activities is the goal of BA, it does not specifically employ strategies to promote physical activity. With a slight change in the emphasis, there is a possibility to focus BA on physical activity. This

can be achieved by selective reinforcement of activities that demand high energy expenditure (Pentecost et al., 2015, Michie et al., 2009). Adapting BA to focus specifically on physical activity could potentially improve uptake of physical activity in women with depression and T2DM, leading to better glycaemic control, in addition to improving depression symptoms.

Some studies have either discussed the possibility of using BA along with physical activity (Lambert et al., 2017, Farrand et al., 2014, Schneider et al., 2011, Turner et al., 2019), or evaluated the feasibility of combined BA and physical activity interventions for the management of depression (Pentecost et al., 2015, Schneider et al., 2016, Lambert et al., 2018). The only study available in the literature that specifically assessed the effects of a combined BA and physical activity intervention for the management of depression in people with T2DM was conducted by Schneider et al. (2011, 2016) (Schneider et al., 2011, Schneider et al., 2016), although they did not describe the intervention development process. The development of an intervention to integrate BA with physical activity for adults with depression has previously been described by Farrand et al. (2014), followed by a pilot RCT to assess the feasibility and acceptability of the intervention (Farrand et al., 2014, Pentecost et al., 2015). The feasibility trial suggested that the integrated BA and physical activity (BACPAc) intervention is feasible and acceptable.

Farrand and his colleagues derived principles from self-determination theory to adapt the BA protocol proposed by Richards (2010) to emphasize physical activity (Richards, 2010). According to self-determination theory, behaviour results from intrinsic motivation (the pleasure one experiences when engaging in a behaviour). Self-determination theory argues that intrinsic motivation can be achieved if three core psychological needs (autonomy, competence, and relatedness) are attained. Self-determination theory emphasizes that meeting these psychological needs is crucial for the initiation and maintenance of behaviour. The fundamental concept of self-determination theory is that a person's psychological needs must be met (autonomy, competence, and relatedness) within an activity for them to be optimally motivated to engage (Deci and Ryan, 1985, Deci and Ryan, 2000, Deci and Ryan, 2008, Ryan et al., 2009). Evidence suggests that

interventions based on self-determination theory which focus on patient preferences could result in more enduring changes in physical activity by fostering autonomy and concentrating on more enduring, intrinsically driven changes (Nyström et al., 2015, Teixeira et al., 2012). Lambert et al. (2017) adapted the concepts of Farrand et al. (2014) to develop a web-based BA and physical activity intervention (Lambert et al., 2017). They also conducted a pilot RCT and reported that a web-based BA and physical activity intervention is feasible for adults with depression (Lambert et al., 2018).

To sum up, there are good arguments for integrating BA with physical activity and there is emerging evidence for the effectiveness of this approach. Moreover, it is evident that integrated BA and physical activity interventions have the potential to promote physical activity and thus tackle depression and T2DM multimorbidity (Pentecost et al., 2015, Schneider et al., 2016, Lambert et al., 2018). However, to date, this work has been carried out in high income countries and may not translate to LMIC contexts. Therefore, integrated BA and physical activity interventions developed in high-income countries need to be adapted and contextualized in LMICs. This is particularly important for women with depression and T2DM living in Pakistan because the existing BA and physical activity interventions may not be feasible for them. Therefore, the current study was designed to adapt an integrated BA and physical activity intervention for women with depression and T2DM living in Pakistan.

5.2.1 Objective

The objective of the study was to adapt an integrated BA and physical activity intervention for women with depression and T2DM living in Pakistan.

5.3 Methods

5.3.1 Intervention for adaptation

BACPAc, developed by Farrand et al. (2014) is the only theoretically informed intervention we found that integrates BA and physical activity for people with depression (Farrand et

al., 2014). Therefore, we chose to adapt this intervention for women with depression and T2DM in Pakistan.

5.3.2 Adaptation framework

The Bernal's cultural adaptation framework was used to guide the choice of intervention aspects that needed adaptation (Bernal et al., 1995). The domains of Bernal's framework are:

- Language (culturally syntonetic language)
- Persons (patient and therapist)
- Metaphors (signs and symbols)
- Content (narrative, characters, illustrations)
- Concept (treatment concepts)
- Goals (goals of the treatment)
- Methods (methods to deliver intervention)
- Context (context specific additional considerations)

The adaptation matrix from the Stirman adaptation classification was used to map and describe the changes made to the original intervention (Stirman et al., 2013)). The matrix has three sections:

- **Content modifications:** In this section, changes made to the intervention procedures, materials, or delivery were mentioned. It has the following subsections:
 - Curricula and components (inclusion or exclusion of elements)
 - Change in pictures or illustrations
 - Intervention dose
- **Contextual modifications:** In this section, modifications to the format or channel, the setting or location in which the overall intervention is delivered, and the personnel who deliver the intervention were mentioned. It has following subsections:
 - Inclusion and exclusion criteria for patients

- Intervention delivery
- **Modifications to the training and evaluation process:** In this section modifications to the of training of personnel/therapists and evaluation measures were mentioned. It has following subsections:
 - Training
 - Evaluation measures

An initial logic model was developed to visualize the process of intervention adaptation (Appendix 8).

5.3.3 Participants

Patient participants, carers, healthcare staff, and social workers/representatives of the public were recruited into the consultative workshops.

5.3.3.1 Patient-participants

Individuals, aged ≥ 18 years, with a physician-confirmed diagnosis of T2DM, and a diagnosis of major depressive disorder as defined by the Structured Clinical Interview for DSM-V disorders and who were able to provide informed consent, were eligible.

5.3.3.2 Carers

Individuals, aged ≥ 18 years, nominated by the patient participants as a carer, who provide care to a family member with the clinical diagnosis of depression and T2DM, and who could provide informed consent, were eligible.

5.3.3.3 Healthcare staff

Diabetes specialists, mental health specialists (psychiatrists/psychologists), and other healthcare staff and managers (nutritionists, and paramedical staff), involved in primary or secondary care of people with depression and T2DM, were eligible. In addition, professionals with relevant knowledge or experience of physical activity interventions (such as physical therapists and public health experts) were eligible.

5.3.3.4 Social workers/representatives of the public

Individuals, aged ≥ 18 years, working for the social welfare of the community, were eligible.

5.3.4 Participants identification

Participants were identified from three main sources:

5.3.4.1 Participants of qualitative study

Individuals (people with depression and T2DM, their carers, and healthcare staff) who participated in the qualitative study (Chapter 4 (Arsh et al., 2023b)), were invited to join the consultative workshops. These individuals were invited to the current study to gain insights from their experiences for the adaptation of integrated BA and physical activity intervention.

5.3.4.2 Participants from DiaDeM study

Patients and healthcare staff (psychologists (supervisors), and non-mental health specialists (facilitators) with experience of delivering BA) who participated in the DiaDeM (management of depression in diabetes) programme, an ongoing National Institute of Health Research (NIHR) funded research project, which aims to develop and test a culturally appropriate approach to the recognition and treatment of depression in people with diabetes in Bangladesh and Pakistan based on BA (Aslam et al., 2022, Zavala et al., 2023), were also invited. These individuals had either received or delivered BA, so they were targeted to gain insights from their experiences.

5.3.4.3 Referral

New participants, who did not take part in the qualitative study, or the DiaDeM programme were also recruited. They were identified with the help of participants who either participated in the qualitative study or in the DiaDeM study.

5.3.5 Recruitment

The research team provided leaflets and participant information sheets, containing information about the research study and information on how to get involved in the study to potential participants. A contact number and email address were provided for the participants to use if they wished to participate. A self-addressed envelope was also provided which potential participants may return if they wish to participate in the study but do not want to call or email. When potential participants made contact, a researcher scheduled meetings with them to re-confirm their eligibility and answer any queries about the study. Written informed consent (either thumbprints or signatures) was obtained on the day of the workshop before the commencement of the workshop by the workshop facilitator.

5.3.6 Data collection

Two consultative workshops were conducted at Khyber Medical University Peshawar in May and June 2023. Each workshop lasted 4 hours with a 30-minute break after the first 120 minutes. Each workshop began with a formal welcome to the participants followed by the introduction of facilitators and participants. The aims and objectives of the workshops and a summary of the intervention adaptation process were communicated to the participants. The content and activities of the workshop were then presented.

5.3.6.1 Workshop 1

The objective of workshop 1 was to identify changes needed in the original intervention. Hard copies of the BAcPac intervention were provided to participants. The workshop facilitators presented the core components of original BAcPac intervention to the participants and explained the need for an adapted intervention. Participants were given enough time to review and understand the core components of the original intervention.

Four personas were presented. Persona characteristics varied in age, marital status/number of children, area (urban/rural), profession, and socioeconomic status. Each persona characteristics are as follows:

- i. Woman with depression and T2DM, aged 58 years, married (4 children), from rural area, schoolteacher, from middle class family.
- ii. Woman with depression and T2DM, aged 37 years, married (3 children's), from rural area, housewife, belongs to lower class family.
- iii. Woman with depression and T2DM, aged 40 years, single, from urban area, lecturer in college, from upper class family.
- iv. Woman with depression and T2DM, aged 60 years, married (2 children's), from urban area, run home based business, from middle class family.

The workshop participants were divided into four groups and one persona was assigned to each group. Each group was asked to identify factors as per the domains of Bernal's framework (language, persons, metaphors, content, concepts, goals, methods, context), specific to the persona that could affect participation and/or adherence to the original BAcPac intervention. A 30-minute break was announced after completion of this activity. During break time, workshop facilitators displayed the personas along with the factors identified by each group for their assigned persona. After break time, participants were requested to suggest changes that could be made to the original BAcPac intervention to overcome constraints identified by participants for the personas. The suggestions presented by participants were noted.

The factors identified by participants that could affect participation and/or adherence to the original BAcPac intervention and the suggestions to overcome these constraints were compiled according to Bernal's framework. The changes in the original BAcPac intervention proposed by workshop participants were made. The Stirman adaptation classification was used to map the changes made to the original intervention (Stirman et al., 2013).

5.3.6.2 Workshop 2

The objective of the 2nd workshop was to present the adapted intervention materials to the stakeholders and refine it. Before the workshop, the adapted intervention materials were provided to the participants of workshop 1 (either in soft copy or hard copy

depending on participant preference) for review and feedback. Sections of the adapted intervention were presented to participants of workshop 2, and they were asked to give their feedback after each section of the presentation. This feedback was used to refine and finalise the adapted intervention materials (Appendix 10).

5.4 Results

5.4.1 Participants

A total of 21 participants attended the first consultative workshop including 7 patient participants (5 female and 2 male), 9 healthcare staff (5 female and 4 male), 2 carers (1 female and 1 male), and 3 social workers/representatives of public (1 female and 2 male) (Table 3).

Table 3: Demographic information of workshop 1 participants (n=21)

S.No.	Role	Age (years)	Gender	Education	Occupation/ speciality
1	Patient-participant	51	Male	Intermediate (12 years of education)	School Teacher
2	Patient-participant	56	Female	No formal education	Housewife
3	Patient-participant	43	Female	Master in Islamic Studies (16 years of education)	School Teacher
4	Patient-participant	48	Female	MPhil in English Literature (18 years of education)	Assistant Professor
5	Patient-participant	50	Female	Bachelor of Arts (14 years of education)	Housewife
6	Patient-participant	59	Male	Matric (10 years of education)	Business
7	Patient-participant	48	Female	Primary (5 years of education)	Tailoring in home
8	Healthcare staff	33	Female	MS in Nutrition Sciences (18 years of education)	Nutritionist

9	Healthcare staff	36	Male	MS in Public Health (18 years of education)	Public Health Specialist
10	Healthcare staff	49	Female	MS in Physical Therapy (18 years of education)	Physical Therapist
11	Healthcare staff	43	Male	MBBS, Fellow of College of Physicians and Surgeons (FCPS)	Psychiatrist
12	Healthcare staff	30	Female	MS in Clinical Psychology (18 years of education)	Psychologist
14	Healthcare staff	35	Male	MS in Nursing (18 years of education)	Nurse
15	Healthcare staff	26	Female	Doctor of Physical Therapy (17 years of education)	Physical Therapist
16	Healthcare staff	40	Male	MBBS, Fellow of College of Physicians and Surgeons (FCPS)	Diabetologist
13	Healthcare staff	29	Female	BS in Nutrition Sciences (16 years of education)	Nutritionist
17	Carer	51	Female	Matric (10 years of education)	Housewife
18	Carer	24	Male	BS Computer Science student	Student
19	Representative of public	45	Male	Matric (10 years of education)	Property dealer/ political leader
20	Social worker	26	Male	Bachelor of Arts (14 years of education)	Computer Operator
21	Social worker	22	Female	BS Sociology student	Student

The second workshop was attended by 16 participants including 6 patient participants (5 female and 1 male), 7 healthcare staff (4 female and 3 male), 2 carers (1 female and 1 male), and 1 female social worker. Of the workshop 2 participants, 11 attended workshop 1 (Table 4).

Table 4: Demographic information of workshop 2 participants (n=16)

S.No.	Role	Age (years)	Gender	Education	Occupation/ speciality
1	Patient-participant	43	Female	Master in Islamic Studies (16 years of education)	School Teacher
2	Patient-participant	48	Female	MPhil in English Literature (18 years of education)	Assistant Professor
3	Patient-participant	50	Female	Bachelor of Arts (14 years of education)	Housewife
4	Patient-participant	48	Female	Primary (5 years of education)	Tailoring in home
5*	Patient-participant	45	Male	Bachelor of Arts (14 years of education)	Govt. employee (Clark)
6*	Patient-participant	41	Female	Master in Home Economics (16 years of education)	Lecturer
7	Healthcare staff	33	Female	MS in Nutrition Sciences (18 years of education)	Nutritionist
8	Healthcare staff	49	Female	MS in Physical Therapy (18 years of education)	Physical Therapist
9	Healthcare staff	30	Female	MS in Clinical Psychology (18 years of education)	Psychologist
10	Healthcare staff	35	Male	MS in Nursing (18 years of education)	Nurse
11	Healthcare staff	40	Male	MBBS, Fellow of College of Physicians and Surgeons (FCPS)	Diabetologist
12*	Healthcare staff	42	Male	MBBS (17 years of education)	Medical Officer

13*	Healthcare staff	35	Female	BS Occupational therapy (16 years of education)	Occupational Therapist
14	Carer	51	Female	Matric (10 years of education)	Housewife
15*	Carer	58	Male	Master in Urdu (16 years of education)	Retired employee Govt.
16	Social worker	22	Female	BS Sociology student	Student
*Participants 5,6,12,13 and 15 were not present in workshop 1.					

5.4.2 Intervention adaptation

The original BAcPac intervention comprised of a self-help workbook ([Get Active layout 1 \(exeter.ac.uk\)](http://exeter.ac.uk)), training manual ([Microsoft Word - Additional file 3.docx \(springer.com\)](http://springer.com)) and case studies [Get Active layout 1 \(exeter.ac.uk\)](http://exeter.ac.uk). The participants carried out a detailed review of the intervention to identify barriers and enablers to delivery within the domains of the Bernal cultural adaptation framework.

5.4.2.1 Language

The original BAcPac intervention was delivered in the English language and therefore it was not possible to use it in Pakistani settings. However, participants highlighted the possibility of translating the intervention content into the Urdu language. Participants emphasized that written Urdu is much easier to understand as compared to other local languages (such as Pashto), therefore, the consensus was that the intervention materials should be translated into Urdu.

5.4.2.2 Persons (patient and therapist)

In the BAcPac intervention, there was no consideration of the patient's and therapist's gender, however, the participants in the consultative workshops felt that women patients and their carers might prefer female therapists. Workshop participants highlighted the comparatively negative attitude of patients and their carers towards healthcare staff other than the treating physician (diabetologist). These attitudes included:

- Patients and carers have more trust in treating physicians and until and unless treating physicians refer (written or verbal referral) them to other healthcare

professionals (psychologists, nutritionists, physical therapists and other allied healthcare professionals), they never visit them.

- Participants highlighted the potential importance of involving family members in the interactions between patient and therapist, particularly if the therapist is male as it may not be possible to have female therapists in some settings.
- In addition, participants discussed the possibility of the person's treating physician providing an initial verbal and/or written description of the intervention, as generally patients and their carers give more importance to recommendations and referrals received from treating physicians. Participants emphasized that the uptake of intervention will likely be higher if the treating physician refers eligible patients (people with depression and T2DM) to the intervention.

5.4.2.3 Metaphors (using signs and symbols)

The original intervention did not include signs or symbols in the self-help workbook. Participants suggested providing signs and symbols to guide patients and their carers. For example, when explaining routine activities, the symbol of a clock can be incorporated in the intervention material to denote 24-hour routine activities. Similarly, to explain pleasurable activities, a smiley emoji can be used.

5.4.2.4 Content

Participants highlighted that the case studies, activities, images, and illustrations used in the original intervention are not appropriate for Pakistani settings. Moreover, participants were concerned that patients may face difficulties reading and understanding lengthy written scripts, instructions, and explanations present in the original intervention manuals.

Participants discussed that case studies specific to local context need to be developed. Similarly, participants emphasized the addition of cultural and religious-specific images and illustrations in the intervention manual. Moreover, participants recognised the need to replace certain textual information with images and illustrations.

5.4.2.5 Concepts

Participants highlighted that patients and their carers often have limited awareness about the positive effects of physical activity on mental health and this might be a barrier to intervention delivery. Participants added that generally people consider rest as more beneficial for people with depression and there could be concerns that physical activities might aggravate their depression symptoms.

Nonetheless, participants stated that patients and their carers are generally aware of the positive effects of physical activity on physical health (weight loss, body appearance, general health) and thus this could help promote engagement in physical activity.

5.4.2.6 Goals

The goal of both original BAcPac intervention and the adapted intervention was to promote physical activity and reduce depressive symptoms. In addition, the adapted intervention also aims to manage blood glucose levels in women with depression and T2DM.

5.4.2.7 Methods

The BAcPac intervention was delivered by psychological well-being practitioners. In the UK, psychological well-being practitioners treat and support individuals with common mental health issues such as depression and anxiety. Psychological well-being practitioners receive British Psychological Society accredited training (45 days of academic work alongside supervised practice for one year) based upon the curriculum developed for the Improving Access to Psychological Therapies (IAPT) program (Richards, 2009, NHS, 2023). The psychological well-being practitioners involved in delivering BAcPac intervention received one day of additional training related to BAcPac intervention.

Participants discussed different possibilities for delivering the adapted intervention in the diabetes care facilities because there is no psychological well-being practitioners role in Pakistan. Similarly, other mental health workers are generally not available in diabetes

care facilities. In addition to this, participants highlighted that patients might face difficulties in visiting healthcare facilities for treatment sessions due to financial constraints, long distances to travel and restrictions to solo travel of women with depression and T2DM. Furthermore, participants emphasized that patients might not be able to fill their worksheets without assistance.

Workshop participants discussed the possibility of training non-mental health specialists who would be available at diabetes care facilities such as nutritionists and nurses to deliver the adapted intervention. Participants emphasized that one-day training might be insufficient to understand the intervention components, therefore non-mental health specialists who are supposed to deliver the adapted intervention should receive at least 3 days of face-to-face training. Participants also advised that follow-up intervention sessions need to be scheduled alongside follow-up diabetic check-ups and these follow-up sessions need to be flexible to accommodate patient needs. Similarly, participants recommended involving family members/ friends to assist patients in completing their worksheets and helping them achieve the goals of the intervention.

5.4.2.8 Context

Participants highlighted that patients might be dependent on carers as in Pakistan women often do not travel alone. Patients might also need permission from husbands/ other male family members to attend sessions.

Participants discussed the possibility of the therapist meeting with carers/family members. Participants highlighted that carers could support therapists in the successful delivery of the intervention and thus it may be necessary to involve family members/carers along with the patient.

Table 5 provides an overview of constraints and enablers identified by the participants of consultative workshops to the delivery of BAcPac intervention to women with depression and T2DM in Pakistan.

Table 5: Constraints and enablers within the domains of the Bernal cultural adaptation framework to deliver integrated Behavioural Activation and physical activity (BACPAc) intervention to women with depression and type 2 diabetes mellitus in Pakistan

Domain	Constraints	Enablers/possible solutions
Language	• Only a limited population can understand the English language • Difficulty in understanding the terms and jargon in the English language (even educated people face difficulties in understanding English terms)	• Translate the intervention contents into Urdu language (understanding written Urdu language is much easier compared to other written local languages) • Feasibility of using layman's language
Persons (patient and therapist)	• Preference of women patients and their carers towards female therapists • A more negative attitude towards other healthcare staff compared to the treating physician	• Involve family members in the interactions between patient and therapist • Participants to receive initial verbal and/or written description and referral from the treating physician
Metaphors	• The original intervention did not include symbols or visuals in the self-help workbook	• Possibility to provide symbols for guidance of patients and their carers
Content (narrative, characters, illustrations)	• Content is primarily focused on depression among people (both men and women) living in the UK • The case studies, activities, images, and illustrations are not appropriate for women in Pakistan	• Revise content to focus on women with depression and T2DM living in Pakistan • Develop case studies specific to our settings • Cultural and religious-specific activities should be added

	• Difficulties in studying and understanding lengthy written scripts, instructions, and explanations • Visual scale from 0 to 6 was used to evaluate difficulties in performing activities which may be a scale range that participants struggle to understand	• Add images and illustrations instead of written text where possible • Add a visual scale from 0 to 10 to evaluate difficulties in performing activities. It will be easier for patients to provide a rating on a 0 to 10 visual scale.
Concepts	• Patients and their carers often have limited awareness about the effects of physical activity on mental health	• Patients and their carers are aware of the positive effects of physical activity on physical health (weight loss, body appearance, general health)
Goals	• The goal of the BAcPAC intervention was to promote physical activity and reduce depressive symptoms because the target population was people with depression	• We aim to use the intervention to promote physical activity and manage both depressive symptoms and blood glucose levels because the target population will be people with depression and T2DM
Methods	• Mental health workers are not available in diabetes care facilities • Difficulties in visiting healthcare facilities for treatment sessions • Patients may not be able to complete their worksheets without assistance	• Train non-mental health specialists on the intervention • Follow-up for intervention sessions needs to be scheduled alongside follow-up for diabetic check-ups/medication. Follow-up sessions need to be flexible to accommodate patient needs

		• Involvement of family members to facilitate the patient throughout the intervention period
Context	• Patients will be dependent on carers as generally women do not travel alone and need permission from their husbands/any other male family member to attend sessions. Moreover, women generally do not make treatment-related decisions without the involvement of family members	• Therapist meeting with carers/family members. Carers can support therapists in the successful delivery of the intervention

5.4.3 Intervention production

5.4.3.1 Content modifications

Curricula and components (inclusion or exclusion of elements): The original intervention was designed for adults with depression only, therefore, we added T2DM along with depression when referring to the target population. Moreover, activities mentioned in the case studies were relevant to people in the UK, therefore, we changed the examples of activities in the case studies to be culturally relevant, particularly we focused on activities that are commonly performed by women in Pakistan such as performing household chores, children's care, visiting neighbours and relatives, care for cattle, helping male partners in farming related activities, gardening in home, and walk within home or in open space.

Change in pictures or illustrations: In the BAcPac intervention manual, there were only a few pictures of people from the UK on the initial pages of the booklet. In addition to replacing the existing pictures, we included some additional pictures presenting the local context to illustrate the activities pictorially. We have added symbols and emojis to the

self-help workbook to guide participants about certain components. Moreover, in the original intervention manual, a visual scale from 0 to 6 was used to evaluate difficulties in performing activities, however, we replaced it with a visual scale from 0 to 10. Participants highlighted that it would be easier to explain a 0 to 10 visual scale to patients and their carers.

Intervention dose: The original intervention consisted of one assessment session, followed by 12 support sessions. Each session was 25 to 35 minutes. The adapted intervention consists of one assessment session followed by 5 support sessions and each session is 30 to 45 minutes. The six sessions will be delivered in 6 to 12 weeks duration to ensure flexibility in the intervention sessions.

Participants highlighted that 12 sessions might not be feasible for the target population. They added that DiaDeM (BA intervention for people with depression and T2DM delivered in Pakistan and Bangladesh (Aslam et al., 2022, Zavala et al., 2023)) and BEACON (BA intervention for people with non-communicable diseases delivered in India (Zainab et al., 2022)) comprised 6 interventions sessions. Participants anticipated that 6 sessions will be feasible for patients, therefore they suggested that the adapted intervention should have 6 intervention sessions.

5.4.3.2 Contextual modifications

Inclusion and exclusion criteria: The original intervention was focused on individuals with depression living in the UK while the adapted intervention is focused on women with depression and T2DM living in Pakistan.

Intervention delivery: The original intervention manual was lengthy with most of the instructions in written format. In the adapted intervention, the self-help materials are more brief with increased verbal input from the therapists. Where possible, written text is replaced with images and illustrations. Similarly, in the original intervention, instructions about support from family/friends were mentioned only a few times. In the adapted

intervention, a stronger social support component is advised to ask patients to involve family or friends if possible.

The original intervention was delivered by trained psychological well-being practitioners; however, the adapted intervention will be delivered by non-mental health specialists working in diabetes care services who will be trained on the delivery of the adapted intervention. Moreover, an initial verbal/written description of the intervention will be provided by the treating physician, who will also be responsible for referring patients to the intervention.

5.4.3.3 Modifications to the training and evaluation process

Training: In the original intervention, trained psychological well-being practitioners received one day of training. For the adapted intervention, non-mental health specialists will receive 3 days of face-to-face training. Moreover, relevant reading materials and/or online resources will be provided to therapists to gain insights about concepts of BA, physical activity and original BAcPac intervention.

Evaluation measures: Physical activity and depression were the main outcomes for the original intervention while we will also evaluate glycaemic control, in addition to physical activity and depression. Moreover, after the treatment, we will also evaluate activities in which patients face difficulties at the start of the treatment, to determine whether engagement in physical activity becomes easier after receiving the intervention.

Table 6 provides an overview of changes made to the BAcPac intervention.

Table 6: Mapping changes made to integrated Behavioural Activation and physical activity (BAcPac) intervention as per Adaptation Matrix from Stirman Adaptation Classification

Description of the original BAcPac intervention contents	Description of the adapted intervention content	Level of adaptation*	Type of adaptation*

<i>Content modifications: changes made to the intervention procedures, materials, or delivery</i>			
<u>Curricula and components: inclusion or exclusion of elements</u>			
The intervention was designed for adults with depression only	We added information about diabetes along with depression, where needed	2	6
Contextual examples of activities relevant to people in the UK	We changed the examples of activities to be culturally relevant. We focused on activities that are commonly performed by women in Pakistan	3	1
<u>Change in pictures or illustrations</u>			
The pictures included were of people from the UK	We included anonymized pictures of women presented in the local context	3	1
There were few pictures on the initial pages of the booklet illustrating only some of the activities	We incorporated some additional pictures to illustrate the activities pictorially	3	1,2,5
Visual scale from 0 to 6 to evaluate difficulties in performing activities	We replaced it with a visual scale from 0 to 10 to evaluate difficulties in performing activities	3	1
<u>Intervention dose</u>			
One assessment session, followed by 12 support sessions. Each session of 25 to 35 minutes	One assessment session followed by 5 support sessions. Each session of 30 to 45 minutes	3	1,4,7

<i>Contextual modifications: modifications to the format or channel, the setting or location in which the overall intervention is delivered, or the personnel who deliver the intervention</i>			
<u>Inclusion and exclusion criteria</u>			
Individuals with depression living in the UK	Women with depression and type 2 diabetes mellitus living in Pakistan	3	Not applicable
<u>Intervention delivery</u>			
The intervention manual is lengthy with most of the instructions in written format	Self-help materials are briefer with increased input from the therapists. Where possible, written text is replaced with images and illustrations	4,5	2,3,4,5,7
Instructions about family/friend support were mentioned only a few times	Throughout the adapted intervention, a stronger social support component is advised to ask patients to involve family members	3	2
The intervention was delivered by trained psychological well-being practitioners who completed an accredited psychological well-being practitioner training programme	The intervention will be delivered by non-mental health specialists working in diabetes care services. Initial verbal/written description and referral to the intervention will be provided by the treating physician	4	Not applicable
<i>Modifications to the training and evaluation process</i>			
<u>Training (changes made to the training of personnel)</u>			

Trained psychological well-being practitioners received an additional one-day training	Non-mental health specialists will receive 3 days of face-to-face training	4	2,5,6,7
<u>Evaluation measures</u>			
Physical activity and depression were the main outcomes	In addition to physical activity and depression, we will also evaluate glycaemic control. Moreover, after the treatment, we will also evaluate activities in which patients face difficulties at the start of the treatment.	2	2,5
* Stirman levels and types of adaptation are presented in Appendix 9.			

5.5 Discussion

BACPAc, an integrated BA and physical activity intervention was adapted for women with depression and T2DM living in Pakistan. Two consultative workshops were conducted to facilitate the process of intervention adaptation. Modifications were made to the original intervention based on the findings of the consultative workshops, to make the intervention culturally appropriate for the target population. The changes made during the adaptation process were mapped according to the Adaptation matrix from the Stirman adaptation classification (Stirman et al., 2013). The workshop participants emphasised that the uptake of the adapted intervention might depend on the involvement of family members and the treating physicians in the intervention delivery.

The main reasons for including family members and carers in the delivery of the adapted intervention are the dependence of women in Pakistan on family members for treatment-related decisions, and difficulties women experience travelling alone to healthcare facilities. In Pakistan, important decisions are usually made by male members of the

family and some reports showed that even women's health-related decisions are usually made by male family members (Tariq et al., 2022, Rowther et al., 2020, Memon et al., 2023). On average, 48% of women in Pakistan have no say in decisions relating to their healthcare. Compared to urban areas, women in rural areas are 1.3 times more likely to report having no say in decisions regarding their health matters. The statistics are more alarming for women of Pashtun ethnicity because the report revealed that about 65% of women in the Pashtun belt had no right to make decisions about their health (Ismail and Dagia, 2018, Ilyas, 2018). Despite improvements in legislation related to women's rights in the last two decades, a major proportion of women remain deprived of their fundamental right to make decisions about their healthcare (Habib et al., 2021, Hussain et al., 2019). That might be one of the reasons that Pakistan was ranked 145 out of 146 countries in a recent gender gap report (WEF, 2022). The fact that women rely on family for treatment-related decisions is of utmost importance as it shows that uptake of the intervention is directly dependent on family involvement. Therefore, the involvement of family members and their carers is essential in the delivery of the adapted intervention. Despite the risk of reinforcing the inequalities for women in decision-making about their health by involving male family members, focusing on depression in women and women's participation in physical activity should contribute to addressing some of these health disparities. There may also be potential to empower women through the intervention to negotiate with family members.

There is high-quality evidence that supports the inclusion of family members in the treatment of people with depression and T2DM. Some of the benefits presented in the literature for including family members in the treatment of people with depression and T2DM include assistance in dietary control, prevention of stigma and isolation, and assistance in the identification of condition-specific symptoms (Mayberry et al., 2021, Gilliss et al., 2019, Gupta et al., 2019, Bukhsh et al., 2020). There is agreement between the findings of the current study and the literature that family members need to be considered while designing, delivering, and upscaling the intervention for people with depression and T2DM. In addition to the factors presented above, family members can support people with depression and T2DM by interpreting intervention materials and

supporting them to effectively use the intervention. Similarly, family members can facilitate communication between patients and therapists.

During the consultative workshops, participants particularly emphasized the importance of the role of treating physicians in intervention delivery. From the findings of the current study, it appeared that generally people with depression and T2DM and their carers follow the advice and prescription of the treating physician while having a more negative attitude towards other healthcare professionals (might be due to limited understanding of their training and role). Participants added that people with depression and T2DM and their carers do not visit other healthcare professionals, follow their instructions, or take their advice seriously until and unless they are referred by the treating physician. During the workshop, participants discussed that treating physicians have busy schedules and due to workload and workforce shortages, it will be implausible for treating physicians to deliver a physical activity intervention in clinical settings. However, keeping in mind the importance of the treating physician's advice for the uptake of intervention, it was incorporated in the intervention material that the treating physician will provide a verbal/written description of the intervention and refer patients to the intervention. The role of healthcare professionals in physical activity promotion to a broad segment of the population is evident from the literature (Cantwell et al., 2018, Lobelo et al., 2018, Vishnubala and Pringle, 2021, Netherway et al., 2021, Brooks et al., 2019b). However, most healthcare professionals, particularly busy clinicians do not formally advise and/or prescribe physical activity in routine clinical practice. Despite this, from the participant's discussion during the workshop, it appeared that the sustainability of the adapted intervention is linked with referral to the intervention by the treating physicians. Therefore, the treating physician's verbal and/or written advice/prescription is particularly mentioned in the adapted intervention.

5.5.1 Limitations

The current study has several limitations. It was conducted in Khyber Pakhtunkhwa and the focus of the adapted intervention was on women of Pashtun ethnicity, therefore generalisability of the adapted intervention to other regions of Pakistan is questionable.

We recruited a diverse group of participants (patient-participants, carers, healthcare staff, social workers) to capture a wide range of views and opinions. However, due to power imbalances, some participants (particularly patient participants) might not have been able to express their views efficiently during consultative workshops. Moreover, due to time constraints and resource limitations, we conducted only two consultative workshops. Despite these limitations, the study involved key stakeholders with diverse backgrounds in the adaptation process. Similarly, in-between workshops, we provided the adapted intervention materials to the stakeholders for review and feedback. Together with the feedback received in-between workshops, we think we were able to identify the most salient adaptations needed. The use of evidence-informed persona to facilitate the workshop discussions, followed good practice guidance, helped to orientate participants to the task. Insights provided by the wide range of stakeholders assisted in identifying factors that can affect the feasibility of the intervention in real-world practice. Similarly, the utilization of the cultural adaptation framework assisted in systematically identifying aspects of the intervention to tailor it to the cultural needs of women with depression and T2DM in the region.

5.5.2 Implications

The study has important implications. At present, physical activity is not formally advised or prescribed in routine clinical practice. Healthcare professionals including treating physicians, other medical doctors, nurses, nutritionists, and paramedics can be trained to deliver the adapted intervention. Moreover, there is the possibility to train lay workers (non-healthcare professionals) for the delivery of the adapted intervention, but this needs further exploration as the focus of the current study was on healthcare professionals who are already present in the diabetes care facilities. The adapted intervention focuses on women with depression and T2DM, however, there is the possibility to further adapt this intervention for other populations. The current study provides preliminary work related to the adaptation of an BA and physical activity intervention, however, we need more evidence to guide policy and practice. There is a need to conduct clinical trials to test the feasibility, acceptance, and effectiveness of the adapted intervention. Moreover, the economic implications of the adapted intervention need to be assessed.

5.6 Conclusion

The study reports the cultural adaptation of a BAcPac intervention for women with depression and T2DM living in Pakistan. The adapted intervention is novel in attempting to offer a solution for physical inactivity among women with depression and T2DM. However, there is a need to assess the feasibility of the adapted intervention and its effectiveness in improving physical activity levels, depressive symptoms, and glycaemic control.

Additional considerations related to the intervention adaptation study

5.7 Methodological considerations

5.7.1 Study Protocol

I developed the study protocol under the supervision of PhD supervisors. The protocol was submitted to Health Sciences Research Governance Committee University of York United Kingdom and Ethics Board of Khyber Medical University Pakistan.

5.7.2 Inclusion and exclusion criteria for participants

In this study, patient-participants (individuals with depression and T2DM), carers, healthcare staff and social workers were included. As described for the qualitative study, the purpose of inclusion of these different population groups was to capture a wide range of views and opinions. Adult participants, aged ≥ 18 years were included. The justifications for including participants aged ≥ 18 years are presented in the previous chapter.

5.7.3 Identification of participants

For consultative workshops, participants were identified from three sources. First, all participants recruited for qualitative study were invited to participate in the workshops. Second, participants (patient-participants and healthcare staff) who participated in the DiaDeM (management of depression in diabetes) programme, were also invited. These individuals had either received or delivered BA, so they were targeted to gain insights from their experiences. Third, new potential participants were identified with the help of participants who either participated in the qualitative study or in the DiaDeM study. Separate information sheets were developed for each group of participants.

5.7.4 Consultative workshops

Through consultative workshops we involve relevant stakeholders in the adaptation process. The purpose of involving relevant stakeholders in the adaptation process was to ensure that the final output would meet the needs of end-users and might be acceptable in the real-world scenario (Louise and Annette, 2019, Masterson et al., 2022, Slattery et

al., 2020). Contrary to traditional approaches where researchers are the sole decision makers, these consultative workshops guaranteed the involvement of relevant stakeholders in the decision-making process (Tay et al., 2021, McGill et al., 2022, Singh et al., 2023). For cultural adaptation of interventions, these consultative workshops is the good approach as the input from stakeholders enables researchers to tailor and contextualize the adapted intervention as per the requirements of end users (Leask et al., 2019, Singh et al., 2023, O'Brien et al., 2021).

For the development and adaptation of physical activity and other lifestyle interventions, these consultative workshops are recommended because behaviour change cannot be achieved without understanding the needs of the target population (Constantin et al., 2022, Creaser et al., 2023). Evidence suggests that for successful translation of physical activity interventions into practice, proposed activities should be relevant and appealing to the target population (Estabrooks and Glasgow, 2006, Angulo et al., 2020, van Sluijs et al., 2021). This is particularly more important for people with comorbid conditions such as depression and T2DM as physical activity promotion in this population is more challenging compared to general population. Therefore, it is important to take their opinions into consideration while developing or adapting physical activity interventions for this population (Law et al., 2021, Howell et al., 2023, McIntosh et al., 2023).

Studies have reported that consultative workshops has the potential to address barriers to translation of physical activity interventions into practice and thus can improve the uptake of the intervention (Edward et al., 2022, Constantin et al., 2022, Brown et al., 2020b, Carr et al., 2021). Similarly, evidence suggests that interventions developed or adapted through involving relevant stakeholders are more acceptable to intervention providers and end-users (Sanders and Stappers, 2008, Tay et al., 2021, Talevski et al., 2023, Meloncelli et al., 2023). Therefore, I conducted consultative workshops for the cultural adaptation of an integrated BA and physical activity intervention.

Despite the potential benefits, literature is scarce about use of consultative workshops in LMICs (Slattery et al., 2020, Singh et al., 2023, Renwick et al., 2023). A wide range of

factors might be responsible for limited use of this approach in health research in LMICs, including a lack of resources, lack of adequate skills and lack of awareness about involvement of different stakeholders including end-users in the research process (Singh et al., 2023, Jagtap, 2022, Brooks et al., 2019a). In addition to these, some of the challenges I faced in arranging and conducting consultative workshops for intervention adaptation included difficulties involving patient participants, particularly women, and keeping an equitable balance of power among stakeholders (patient participants, their carers, healthcare professionals and social workers) during discussions.

5.7.5 Adaptation framework

Intervention adaptation is generally performed to modify an existing intervention to meet the needs of new context (Wiltsey Stirman et al., 2019, Movsisyan et al., 2019). The aim to tailor the intervention to a new culture and/or population is the most common reason for intervention adaptation (Perera et al., 2020, Dickerson et al., 2020). Other less common reasons for adaptation include the need to condense the original intervention, increase intervention accessibility and improve feasibility of implementation (Escoffery et al., 2018). Literature suggests that cultural adaptation is an efficient method to reach underserved populations (Zavala et al., 2023, Walters et al., 2020, Lovell et al., 2014). Culturally adapted interventions take into consideration cultural, religious, social and economic factors of the new context and thus have better acceptability in clinical practice.

Several intervention adaptation frameworks are available (Escoffery et al., 2019, Eriksen et al., 2021), however, limited guidance is available about their use to culturally adapt interventions in practice, particularly in LMIC settings. The intervention adaptation process presented in this thesis was guided by the Bernal cultural adaptation framework (Bernal et al., 1995). Certain domains such as language, persons, metaphors, and context need to be considered for the cultural adaptation of the intervention (Escoffery et al., 2019, Mabunda et al., 2022). The Bernal framework covers all these culturally sensitive elements and addresses the cultural context of the adaptation process; therefore, it appeared to be the most appropriate framework for cultural adaptation of intervention. The Bernal framework was successfully used by previous studies for

intervention adaptation (Akhtar et al., 2021, Nisar et al., 2020, Singh et al., 2021, Zavala et al., 2023, Mabunda et al., 2022). Moreover, some studies described experience of its use in the cultural adaptation of interventions in LMICs (Zavala et al., 2023, Mabunda et al., 2022).

5.8 Ethical considerations

5.8.1 General considerations

An approach similar to that presented for qualitative study (Chapter 4) was applied for obtaining informed consent from participants. Similarly, same approaches were applied to ensure privacy and confidentiality.

5.8.2 Special considerations for dealing people with depression and type 2 diabetes mellitus

The study included people with depression and T2DM. The additional safeguards related to consent process, distress and disclosure presented in the qualitative study (Chapter 4) were also taken during the consultative workshops. As described in Chapter 4, the purpose of these additional measures was to protect the rights and welfare of patient-participants.

Part III: Discussion

Chapter 6: Discussion

6.1 Summary and integration of key findings

Depression and T2DM multimorbidity is associated with significant human suffering and financial constraints. Most interventions address depression and T2DM separately. However, an intervention which integrates BA with a physical activity intervention has the potential to tackle both depression and T2DM, and in doing so, potentially realise better outcomes for both conditions. I started the current research work to adapt an integrated BA and physical activity intervention for people with depression and T2DM living in Pakistan. However, I identified a scarcity of high-quality evidence regarding the effectiveness of physical activity in the management of depression in this population. Therefore, I first designed and conducted a systematic review and meta-analysis to comprehensively summarise the evidence regarding the effects of physical activity in managing depressive symptoms in people with T2DM. Moreover, I also aimed to summarise the evidence on the effectiveness of physical activity in achieving glycaemic control in this population.

6.1.1 Systematic review and meta-analysis to assess effectiveness of physical activity

The systematic review reported that physical activity administered alone or in combination with psychological interventions significantly improves depressive symptoms in people with T2DM. Similarly, studies conducted both in high-income countries and LMICs support the effectiveness of physical activity in managing depressive symptoms. However, there was no difference in the effect of physical activity on depressive symptoms compared with control interventions in studies that included only women with T2DM. Similarly, the review suggested that the effects of physical activity were non-significant for improving glycaemic control in people with both depressive symptoms and T2DM, although the latter findings were based on limited evidence. In the discussion section (section 3.5) and the way forward section (section 3.9) of my systematic review, I have presented different perspectives to explain these surprising findings. Particularly, the finding that physical activity does not reduce depressive symptoms in women

highlighted the need to further explore factors that might be responsible for the non-significant effects of physical activity in managing depressive symptoms in women. Although I did not find any apparent explanation, however, some studies reported that limited uptake of physical activity can impact its potential effectiveness in women (Cahuas et al., 2020, Sharkey, 2019). This interpretation was based on limited available studies, and I was unable to locate high-quality evidence to support it. The detailed discussion regarding the findings of the systematic review is presented in section 3.5.

I identified a need for context-specific research to better understand the facilitators and barriers to uptake of physical activity in different settings. Therefore, I designed and conducted a qualitative study to explore the experiences, perceptions, and attitudes of people with depression and T2DM, their carers, and healthcare staff about facilitators and barriers to physical activity in people with depression and T2DM in Pakistan.

6.1.2 Qualitative study to explore enablers and constraints to physical activity

After completion of the systematic review, I conducted a qualitative study to better understand specific enablers and constraints to physical activity in Pakistan. I interviewed 23 participants (11 patient participants, 8 healthcare staff, and 4 carers). Inductive thematic analysis was used to identify themes. The study reported that individual, cultural, and healthcare system-level barriers and facilitators can affect the participation of people with depression and T2DM in physical activity. The study highlighted that due to prevailing cultural values and norms, women face additional barriers to being physically active. The study suggested that various religious, social, cultural, domestic, and occupational activities provide opportunities to perform physical activities. The detailed discussion regarding the findings of the qualitative study is presented in section 4.5.

The study highlighted the need for culturally appropriate physical activity interventions for women with depression and T2DM in Pakistan. Therefore, I designed and conducted a study to adapt an integrated BA and physical activity intervention for women with depression and T2DM residing in Pakistan.

6.1.3 Study to adapt integrated BA and physical activity intervention

The main output from this thesis was the adaptation of the BAcPac intervention for women with depression and T2DM living in Pakistan. For the intervention adaptation, I conducted two consultative workshops with key stakeholders (people with depression and T2DM, their carers, healthcare workers, and social workers). Bernal's cultural adaptation framework was used to guide the intervention adaptation process.

Despite ongoing research and strategies to tackle non-communicable diseases, such as depression and T2DM, there was still a significant knowledge gap regarding how to promote physical activity among women in Pakistan. However, the adapted BA and physical activity intervention may offer a chance to encourage women with depression and T2DM, who may be less active than the general population, to engage in physical activity. The components of the adapted intervention are culturally appropriate for the target population and might be applicable in resource-limited settings. The intervention focuses on women's routine, pleasurable, and necessary activities, therefore it might be possible to increase physical activity levels among women with depression and T2DM. Following the adaptation of this intervention, its feasibility, acceptability, and effectiveness need to be assessed. The detailed discussion regarding the findings of the study is presented in section 5.5.

6.2 Limitations

The research work presented in this thesis has some limitations. Physical activity behaviour is affected by a myriad of factors, and I was not able to explore all these factors in detail. For example, I was not able to assess the built environment and urban planning as predictors of physical activity promotion. Moreover, I was not able to assess the feasibility and acceptability of the adapted intervention. It therefore may need further refining before assessing its effectiveness in a definitive clinical trial. Similarly, there may be a wide range of barriers to its implementation in clinical practice which are not explored in this thesis. For example, workforce shortages and limited acceptability towards the concepts of task-shifting might hinder the implementation of the adapted intervention in

clinical practice and therefore need further exploration. One of the limitations of the qualitative study was that it included participants from a broader demographic than the target population (women with depression and T2DM). Future studies should aim for more targeted recruitment to ensure the findings are directly applicable to the specific group of interest. Moreover, I could not report on facilitators and barriers at a policy level since I did not examine policymakers' opinions in the research work presented in this thesis. Although healthcare professionals discussed the crucial role of policy in promoting physical activity, most were unsure of any government programmes or policy-relevant facilitators and barriers. I am aware that implementation of the adapted intervention and its scale-up is linked to the availability of relevant policies, therefore missing policymakers is an important limitation of the research work presented in this thesis. Furthermore, the transferability and generalisability of the findings presented in the current thesis are limited because the research is primarily focused on people with depression and T2DM in Khyber Pakhtunkhwa.

Despite these limitations, the research presented in the current thesis was one of the first attempts to explore avenues of physical activity promotion for people with depression and T2DM in Pakistan. Particularly, physical activity promotion among women of Pashtun ethnicity is considered particularly challenging as they are mostly confined to their homes. The conditions are more restrictive in rural areas as people strongly observe their cultural values. The adapted intervention might be helpful in physical activity promotion in this population as it mainly focuses on the activities that can be performed within the available resources and are culturally appropriate. The findings of the research work might be applicable to residents in various parts of Pakistan. The findings may also apply to Afghanistan, where the Pashtun ethnic group is the dominant ethnic group and shares the same religious practices and cultural values. Furthermore, because LMICs frequently encounter comparable obstacles to promoting physical exercise, the findings may apply to other LMICs, notably those in South Asia.

6.3 Implications

6.3.1 Integration of physical activity promotion strategies in the existing healthcare system

The systematic review reported that physical activity alone or in conjunction with other therapies can significantly reduce depressive symptoms in people with T2DM. The studies conducted in both high-income countries and LMICs support the use of physical activity for managing depressive symptoms in people with T2DM. Despite this evidence, physicians do not regularly evaluate or prescribe physical activity as established treatment modality in routine care. The research studies presented in this thesis highlighted that patients and their carers follow advice and/or prescription of healthcare professionals, particularly of treating physicians. Hence, if people with depression and T2DM are properly guided about physical activity at diabetes care facilities by healthcare professionals/treating physicians, it may improve uptake of physical activity. Participants of the qualitative study had the opinion that physical activity promotion strategies can be incorporated into the existing healthcare system by harnessing routinely available healthcare resources. These findings explicitly emphasized the urgent need for policies and recommendations to promote the prescription of physical activity in routine clinical practice. Moreover, future research studies should focus on implementation and scale-up strategies to promote physical activity prescription in clinical settings.

6.3.2 Physical activity promotion among women with depression and type 2 diabetes mellitus

The systematic review reported that physical activity was not effective in managing depressive symptoms in studies which included only women with T2DM. Given the limited evidence on which this finding is based, future research studies on the effects of physical activity for depression in T2DM should report findings for both genders separately. It was found that due to existing cultural values and norms, limited resources, and financial constraints, physical activity approaches and interventions generally applied for the management of depression might not be applicable to women residing in Pakistan. The findings suggested that physical activity could be promoted in this population if we focus

on activities that they are currently performing or were involved in previously. Future studies should assess the effects of these low-intensity activities in the promotion of physical activity and the management of depressive symptoms among women with depression and T2DM. In addition, these activities can be advised in clinical practice to encourage women with depression and T2DM to be physically active. Furthermore, there is a need for effective public health policies to support promotion of physical activity among women.

6.3.3 Integrated Behavioural Activation and physical activity intervention for women with depression and type 2 diabetes mellitus

The intervention adaptation study resulted in the cultural adaptation of an integrated BA and physical activity intervention. The adapted intervention might assist in the management of depression and glycaemic control in people with depression and T2DM, however, there is a need to assess its feasibility and acceptability. Moreover, there is need for a definitive clinical trial to determine its effectiveness in improving depressive symptoms and blood glucose levels. The adapted intervention presented in this thesis was specifically focused on women with depression and T2DM residing in Khyber Pakhtunkhwa, Pakistan. However, the intervention can be adapted to other resource-limited settings. Moreover, it has the potential to be adapted for women with other comorbid conditions. Therefore, future studies should focus on the adaptation of integrated BA and physical activity intervention to other populations. In future, the adapted intervention can be introduced and implemented in clinical settings to pave a pathway for the integration of physical activity promotion strategies in the existing healthcare system.

6.3.4 Use of intervention adaptation frameworks

The concept of systematic, theoretically informed intervention development and adaptation is rare in Pakistan. I successfully conducted consultative workshops and used intervention adaptation frameworks as part of the research presented in this thesis. The thesis provided comprehensive details about the processes and stakeholders involved in the cultural adaptation of the intervention. This could assist in introducing the concepts of intervention development and adaptation in Pakistan and other LMICs. Future

researchers can take help from the methods presented in this thesis for cultural adaptation of interventions. Moreover, future research and policy planning must involve relevant stakeholders in the decision-making process.

6.4 Conclusion

Physical activity has the potential to manage depressive symptoms among individuals with T2DM. However, limited uptake of physical activity interventions, particularly in women, can reduce their potential effectiveness in managing depressive symptoms. This has important implications for women residing in Pakistan as they face additional barriers to physical activity due to prevailing cultural values and norms. Integrated BA and physical activity intervention offer a possible solution. The research presented in this thesis culturally adapted an integrated BA and physical activity intervention for women with depression and T2DM residing in Pakistan. The adapted intervention is novel in attempting to offer a solution for physical inactivity among women with depression and T2DM. There is a need to assess the feasibility, acceptability, and effectiveness of the adapted intervention in improving physical activity levels, depressive symptoms, and glycaemic control among women with depression and T2DM living in Pakistan.

Appendices

Appendix 1: Systematic review search strategy

Ovid MEDLINE(R) ALL

Coverage: <1946 to October 06, 2021>

- 1 exp Exercise/ or exp Exercise Therapy/ or exp Exercise Movement Techniques/
259436
- 2 exp "Physical Education and Training"/ 13827
- 3 exp Physical Fitness/ 33361
- 4 exp Physical Exertion/ 57038
- 5 exp Walking/ 59927
- 6 exp Running/21938
- 7 exp Jogging/ 828
- 8 exp Swimming/ 25622
- 9 walk*.mp. 140020
- 10 run*.mp. 216358
- 11 swim*.mp. 48176
- 12 exp Bicycling/ 11981
- 13 cycling.mp. 68487
- 14 exercis*.mp. 418347
- 15 (physical adj3 (activit* or educa* or train* or effort or fit* or work* or move* or
condit*)).mp. [mp=title, abstract, original title, name of substance word, subject heading
word, floating sub-heading word, keyword heading word, organism supplementary
concept word, protocol supplementary concept word, rare disease supplementary
concept word, unique identifier, synonyms] 212862
- 16 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15
960044
- 17 exp Depression/ 132796
- 18 exp Depressive Disorder, Major/ or exp Depressive Disorder/ or exp Depressive
Disorder, Treatment-Resistant/ 114622
- 19 depress*.mp.586008

- 20 dysthymi*.mp. 3678
- 21 (mental* adj3 (ill* or disorder* or health or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 407826
- 22 (affective adj3 (ill* or disorder* or health or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 38271
- 23 (psych* adj3 (ill* or disorder* or health or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 240196
- 24 (mood adj3 (ill* or disorder* or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 38815
- 25 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 1055961
- 26 exp Diabetes Mellitus, Type 2/ 146967
- 27 (diabet* adj3 ("2" or "II" or two*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 222234
- 28 ((maturit* or adult* or slow*) adj3 diabet*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 13845

- 29 ((non-insulin* or non insulin* or noninsulin*) adj3 diabet*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 11986
- 30 (NIDDM or T2DM or T2D).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 44625
- 31 (DM* adj3 ("2" or "II" or two*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] 23902
- 32 26 or 27 or 28 or 29 or 30 or 31 250859
- 33 16 and 25 and 32 1285

APA PsycInfo

Coverage: <1806 to September Week 4 2021>

- 1 exp Exercise/ or exp Aerobic Exercise/ 28579
- 2 exp Physical Activity/ 46296
- 3 exp movement therapy/ or exp dance therapy/ or exp recreation therapy/ 2675
- 4 exp Physical Education/ 4817
- 5 exp Physical Fitness/ or exp Training/ 85575
- 6 exp Walking/ 6094
- 7 exp Running/ 2156
- 8 exp Swimming/ 1935
- 9 walk*.mp. 31861
- 10 run*.mp. 49089
- 11 swim*.mp. 11785
- 12 Jogging.mp. 361
- 13 (Bicycling or cycling).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 6317
- 14 exercis*.mp. 86330
- 15 exp Sports/ 36447
- 16 (physical adj3 (activit* or educa* or train* or effort or fit* or work* or move* or condit* or exert*)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 66019
- 17 exp Energy Expenditure/ 5237
- 18 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 321735
- 19 exp "Depression (Emotion)"/ or exp Major Depression/ or exp Reactive Depression/ or exp Late Life Depression/ 166417
- 20 exp Emotional States/ or exp Emotional Trauma/ 310894
- 21 exp Distress/ 24726
- 22 exp Grief/ 13412
- 23 exp Hopelessness/ 2062
- 24 exp Sadness/ 2362

25 depress*.mp.393324

26 dysthymi*.mp. 4360

27 (mental* adj3 (ill* or disorder* or health or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 367441

28 (affective adj3 (ill* or disorder* or health or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 40689

29 (psych* adj3 (ill* or disorder* or health or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 222610

30 (mood adj3 (ill* or disorder* or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 28057

31 (emotio* or distres*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 505380

32 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31
1265110

33 exp Type 2 Diabetes/ 5061

34 exp Diabetes Mellitus/ or exp Diabetes/ 18945

35 (diabet* adj3 ("2" or "II" or two*)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 9551

36 ((maturit* or adult* or slow*) adj3 diabet*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 5504

37 ((non-insulin* or non insulin* or noninsulin*) adj3 diabet*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh]
281

38 (NIDDM or T2DM or T2D).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 1805

39 (DM adj3 ("2" or "II" or two*)).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh] 356

40	33 or 34 or 35 or 36 or 37 or 38 or 39	22414
41	18 and 32 and 40	964

Embase

Coverage: <1974 to 2021 October 06>

- 1 exp low intensity exercise/ or exp isotonic exercise/ or exp leg exercise/ or exp closed kinetic chain exercise/ or exp anaerobic exercise/ or exp dynamic exercise/ or exp aquatic exercise/ or exp aerobic exercise/ or exp isokinetic exercise/ or exp treadmill exercise/ or exp exercise intensity/ or exp exercise/ or exp moderate intensity exercise/ or exp open kinetic chain exercise/ or exp arm exercise/ or exp high intensity exercise/ or exp isometric exercise/ 384827
- 2 exp physical well-being/ or exp physical activity/ 467935
- 3 exp fitness/ 38679
- 4 exp energy expenditure/ 35795
- 5 exp physical education/ 12025
- 6 exp walking/ 130843
- 7 exp running/ 34224
- 8 exp jogging/ 2220
- 9 exp swimming/ 24158
- 10 exp cycling/ 13369
- 11 walk*.mp. 218274
- 12 run*.mp. 304718
- 13 swim*.mp. 59334
- 14 exercis*.mp. 571255
- 15 (physical adj3 (activit* or educa* or train* or effort or fit* or work* or move* or condit*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 302775
- 16 exp sport/ 184975
- 17 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 1474658
- 18 exp late life depression/ or exp reactive depression/ or exp treatment resistant depression/ or exp major depression/ or exp minor depression/ or exp depression/ or exp long term depression/ 523441

19 exp depressive psychosis/ 1355

20 depress*.mp.852383

21 dysthymi*.mp. 10041

22 (mental* adj3 (ill* or disorder* or health or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 571500

23 (affective adj3 (ill* or disorder* or health or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 34867

24 (psych* adj3 (ill* or disorder* or health or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 289822

25 (mood adj3 (ill* or disorder* or disease or diagnos* or condition or symptom*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 72044

26 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 1440596

27 exp non insulin dependent diabetes mellitus/ 284158

28 (diabet* adj3 ("2" or "II" or two*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 278694

29 ((maturit* or adult* or slow*) adj3 diabet*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 20325

30 ((non-insulin* or non insulin* or noninsulin*) adj3 diabet*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 287550

31 (NIDDM or T2DM or T2D).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 75243

32 (DM* adj3 ("2" or "11" or two*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 36256

33 27 or 28 or 29 or 30 or 31 or 32 401280

34 exp randomized controlled trial/ 679894

35 exp randomization/ 92227

36 exp controlled clinical trial/ 868268

37 trial.mp. 2315720

38 (randomi#ed or randomi#ation or randomi#ing).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 1355457

39 (RCT or "at random" or (random* adj3 (administ* or allocat* or assign* or class* or control* or determine* or divide* or division or distribut* or expose* or fashion or number* or place* or recruit* or split or substitut* or treat*))).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 1265269

40 ((singl* or doubl* or trebl* or tripl*) adj3 (blind* or mask* or dummy)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 331495

41 ((allocat* or assign* or receive*) and (placebo or no-treatment or waitlist or wait* list* or ((treatment or care) adj2 usual)) and (control or group)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word] 109800

42 (group?.ab. or study.ti,ab.) and (placebo or waitlist* or wait* list* or ((treatment or
care) adj2 usual)).mp. [mp=title, abstract, heading word, drug trade name, original title,
device manufacturer, drug manufacturer, device trade name, keyword heading word,
floating subheading word, candidate term word] 345368

43 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 2860307

44 17 and 26 and 33 and 43 931

CINAHL (EBSCO)**Coverage: 1937 to Friday, October 08, 2021 7:16:09 AM**

#	Query	Limiters/Expanders	Last Run Via	Results
			Interface - EBSCOhost Research Databases Expanders - Apply Search Screen - Advanced equivalent subjects Search	
S34	S16 AND S26 AND S33	Search modes - Boolean/Phrase	Database - CINAHL Complete	1,465
			Interface - EBSCOhost Research Databases Expanders - Apply Search Screen - Advanced equivalent subjects Search	
S33	S27 OR S28 OR S29 OR S30 OR S31 OR S32	Search modes - Boolean/Phrase	Database - CINAHL Complete	133,305
			Interface - EBSCOhost Research Databases Expanders - Apply Search Screen - Advanced equivalent subjects Search	
S32	(DM* N3 ("2" or "II" or two*))	Search modes - Boolean/Phrase	Database - CINAHL Complete	2,956
			Interface - EBSCOhost Research Databases Expanders - Apply Search Screen - Advanced equivalent subjects Search	
S31	(NIDDM or T2DM or T2D)	Search modes - Boolean/Phrase	Database - CINAHL Complete	54,928

					Interface -	EBSCOhost	
					Research	Databases	
	((non-insulin* or non	Expanders -	Apply	Search	Screen -	Advanced	
	insulin*	or equivalent	subjects	Search			
	noninsulin*)	N3	Search	modes -	Database -	CINAHL	
S30	diabet*)		Boolean/Phrase		Complete		1,976
					Interface -	EBSCOhost	
					Research	Databases	
		Expanders -	Apply	Search	Screen -	Advanced	
		equivalent	subjects	Search			
	((maturit* or adult* or	Search	modes -	Database -		CINAHL	
S29	slow*) N3 diabet*)		Boolean/Phrase		Complete		70,731
					Interface -	EBSCOhost	
					Research	Databases	
		Expanders -	Apply	Search	Screen -	Advanced	
		equivalent	subjects	Search			
	(diabet* N3 ("2" or	Search	modes -	Database -		CINAHL	
S28	"II" or two*))		Boolean/Phrase		Complete		86,879
					Interface -	EBSCOhost	
					Research	Databases	
		Expanders -	Apply	Search	Screen -	Advanced	
		equivalent	subjects	Search			
	(MH "Diabetes	Search	modes -	Database -		CINAHL	
S27	Mellitus, Type 2")		Boolean/Phrase		Complete		65,422
	S17 OR S18 OR S19	Expanders -	Apply	Interface -		EBSCOhost	
	OR S20 OR S21 OR	equivalent	subjects	Research		Databases	
	S22 OR S23 OR S24	Search	modes -	Search	Screen -	Advanced	
S26	OR S25		Boolean/Phrase		Search		504,110

					Database -	CINAHL	
					Complete		
					Interface -	EBSCOhost	
					Research	Databases	
	mood N3 (ill* or	Expanders -	Apply	Search Screen -	Advanced		
	disorder* or disease or	equivalent	subjects	Search			
	diagnos* or condition	Search	modes -	Database -	CINAHL		
S25	or symptom*)	Boolean/Phrase		Complete		10,018	
					Interface -	EBSCOhost	
	psych* N3 (ill* or				Research	Databases	
	disorder* or health or	Expanders -	Apply	Search Screen -	Advanced		
	disease or diagnos* or	equivalent	subjects	Search			
	condition or	Search	modes -	Database -	CINAHL		
S24	symptom*)	Boolean/Phrase		Complete		182,051	
					Interface -	EBSCOhost	
	affective N3 (ill* or				Research	Databases	
	disorder* or health or	Expanders -	Apply	Search Screen -	Advanced		
	disease or diagnos* or	equivalent	subjects	Search			
	condition or	Search	modes -	Database -	CINAHL		
S23	symptom*)	Boolean/Phrase		Complete		16,304	
					Interface -	EBSCOhost	
	mental* N3 (ill* or				Research	Databases	
	disorder* or health or	Expanders -	Apply	Search Screen -	Advanced		
	disease or diagnos* or	equivalent	subjects	Search			
	condition or	Search	modes -	Database -	CINAHL		
S22	symptom*)	Boolean/Phrase		Complete		221,566	
					Interface -	EBSCOhost	
		Expanders -	Apply	Research	Databases		
S21	dysthymi*	equivalent	subjects			1,054	

		Search modes -	Search Screen - Advanced	
		Boolean/Phrase	Search	
			Database - CINAHL	
			Complete	
			Interface - EBSCOhost	
			Research Databases	
		Expanders - Apply	Search Screen - Advanced	
		equivalent subjects	Search	
	(MH "Dysthymic	Search modes -	Database - CINAHL	
S20	Disorder")	Boolean/Phrase	Complete	449
			Interface - EBSCOhost	
			Research Databases	
		Expanders - Apply	Search Screen - Advanced	
		equivalent subjects	Search	
		Search modes -	Database - CINAHL	
S19	depress*	Boolean/Phrase	Complete	201,120
			Interface - EBSCOhost	
			Research Databases	
	(MH "Bipolar	Expanders - Apply	Search Screen - Advanced	
	Disorder+") OR (MH	equivalent subjects	Search	
	"Affective Disorders,	Search modes -	Database - CINAHL	
S18	Psychotic+")	Boolean/Phrase	Complete	13,306
			Interface - EBSCOhost	
			Research Databases	
		Expanders - Apply	Search Screen - Advanced	
		equivalent subjects	Search	
		Search modes -	Database - CINAHL	
S17	(MH "Depression+")	Boolean/Phrase	Complete	122,475

	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15	Expanders - equivalent Search Boolean/Phrase	Apply subjects modes - Complete	Interface - Research Search Screen - Search Database - Complete	EBSCOhost Databases Advanced CINAHL	495,343
S15	(MH "Swimming")	Expanders - equivalent Search Boolean/Phrase	Apply subjects modes - Complete	Interface - Research Search Screen - Search Database - Complete	EBSCOhost Databases Advanced CINAHL	4,613
S14	physical N3 (activit* OR educa* OR train* OR effort OR fit* OR work* OR move* OR condit*)	Expanders - equivalent Search Boolean/Phrase	Apply subjects modes - Complete	Interface - Research Search Screen - Search Database - Complete	EBSCOhost Databases Advanced CINAHL	124,752
S13	exercis*	Expanders - equivalent Search Boolean/Phrase	Apply subjects modes - Complete	Interface - Research Search Screen - Search Database - Complete	EBSCOhost Databases Advanced CINAHL	200,997
S12	(MH "Cycling") OR (MH "Ergometry") OR (MH "Bicycles")	Expanders - equivalent Search Boolean/Phrase	Apply subjects modes - Search	Interface - Research Search Screen - Search	EBSCOhost Databases Advanced	12,924

			Database -	CINAHL	
			Complete		
			Interface -	EBSCOhost	
			Research	Databases	
		Expanders -	Apply	Search Screen -	Advanced
		equivalent	subjects	Search	
		Search	modes -	Database -	CINAHL
S11	swim*	Boolean/Phrase	Complete		7,854
			Interface -	EBSCOhost	
			Research	Databases	
		Expanders -	Apply	Search Screen -	Advanced
		equivalent	subjects	Search	
		Search	modes -	Database -	CINAHL
S10	run*	Boolean/Phrase	Complete		54,401
			Interface -	EBSCOhost	
			Research	Databases	
		Expanders -	Apply	Search Screen -	Advanced
		equivalent	subjects	Search	
		Search	modes -	Database -	CINAHL
S9	walk*	Boolean/Phrase	Complete		77,742
			Interface -	EBSCOhost	
			Research	Databases	
		Expanders -	Apply	Search Screen -	Advanced
		equivalent	subjects	Search	
		Search	modes -	Database -	CINAHL
S8	(MH "Jogging")	Boolean/Phrase	Complete		275
			Interface -	EBSCOhost	
			Research	Databases	
		Expanders -	Apply	Search Screen -	Advanced
		equivalent	subjects	Search	
		Search	modes -	Database -	CINAHL
S7	(MH "Running+")	Boolean/Phrase	Complete		14,117

		Search	modes -	Search		
		Boolean/Phrase		Database -	CINAHL	
				Complete		
				Interface -	EBSCOhost	
				Research	Databases	
		Expanders -	Apply	Search	Screen -	Advanced
		equivalent	subjects	Search		
	(MH "Walking") OR	Search	modes -	Database -	CINAHL	
S6	(MH "Sports+")	Boolean/Phrase		Complete		107,737
		Expanders -	Apply	Interface -	EBSCOhost	
		equivalent	subjects	Research	Databases	
	(MH "High-Intensity	Search	modes -	Search	Screen -	Advanced
S5	Interval Training")	Boolean/Phrase		Search	Screen	1,344
		Expanders -	Apply	Search	Screen -	Advanced
		equivalent	subjects	Search		
		Search	modes -	Database -	CINAHL	
S4	(MH "Movement+")	Boolean/Phrase		Complete		120,558
				Interface -	EBSCOhost	
				Research	Databases	
		Expanders -	Apply	Search	Screen -	Advanced
		equivalent	subjects	Search		
	(MH "Physical	Search	modes -	Database -	CINAHL	
S3	Fitness+")	Boolean/Phrase		Complete		19,822
	(MH "Physical	Expanders -	Apply	Interface -	EBSCOhost	
	Activity") OR (MH	equivalent	subjects	Research	Databases	
	"Physical Education,	Search	modes -	Search	Screen -	Advanced
S2	Adapted") OR (MH	Boolean/Phrase		Search		45,650

	"Physical Activity (Omaha)"		Database - Complete	CINAHL	
	(MH "Exercise+") OR (MH "Resistance Training") OR (MH "Therapeutic Exercise+") OR (MH "Group Exercise") OR (MH "Sport Specific Training") OR (MH "Exercise Intensity")	Expanders - OR (MH "Open Kinetic Chain Exercises")	Apply equivalent Search modes - Boolean/Phrase	Interface - Research Search Screen - Search Database - Complete	EBSCOhost Databases Advanced CINAHL 150,627
S1					

AMED (Allied and Complementary Medicine)

Coverage: <1985 to October 2021>

- 1 exp Exercise/ or exp Physical fitness/ 12197
- 2 exp Exercise therapy/ 8989
- 3 exp Physical education/ 2045
- 4 exp Exertion/ or exp Perceived exertion/ 2411
- 5 exp Walking/ 6451
- 6 exp Running/2371
- 7 exp Jogging/ 21
- 8 exp Swimming/ 460
- 9 walk*.mp. 12105
- 10 run*.mp. 4440
- 11 swim*.mp. 897
- 12 exp Bicycling/ 863
- 13 cycling.mp. 1032
- 14 Oxygen consumption/ 1879
- 15 exercis*.mp. 29144
- 16 (physical adj3 (activit* or educa* or train* or effort or fit* or work* or move* or
condit*)).mp. [mp=abstract, heading words, title] 10535
- 17 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16
47461
- 18 exp Depression/ or Emotions/ 3948
- 19 exp depressive disorder/ 2095
- 20 depress*.mp.8880
- 21 (mental* adj3 (ill* or disorder* or health or disease or diagnos* or condition or
symptom*)).mp. [mp=abstract, heading words, title] 10806
- 22 (affective adj3 (ill* or disorder* or health or disease or diagnos* or condition or
symptom*)).mp. [mp=abstract, heading words, title] 710
- 23 (psych* adj3 (ill* or disorder* or health or disease or diagnos* or condition or
symptom*)).mp. [mp=abstract, heading words, title] 5914

- 24 (mood adj3 (ill* or disorder* or disease or diagnos* or condition or symptom*)).mp.
[mp=abstract, heading words, title] 442
- 25 18 or 19 or 20 or 21 or 22 or 23 or 24 24833
- 26 Diabetes mellitus/ or exp diabetes mellitus type 2/ 3547
- 27 (diabet* adj3 ("2" or "II" or two*)).mp. [mp=abstract, heading words, title] 1432
- 28 ((maturit* or adult* or slow*) adj3 diabet*).mp. [mp=abstract, heading words, title]
188
- 29 ((non-insulin* or non insulin* or noninsulin*) adj3 diabet*).mp. [mp=abstract,
heading words, title]88
- 30 (NIDDM or T2DM or T2D).mp. [mp=abstract, heading words, title] 249
- 31 (DM* adj3 ("2" or "II" or two*)).mp. [mp=abstract, heading words, title] 102
- 32 26 or 27 or 28 or 29 or 30 or 31 3951
- 33 17 and 25 and 32 31

HMIC Health Management Information Consortium

Coverage: <1979 to July 2021>

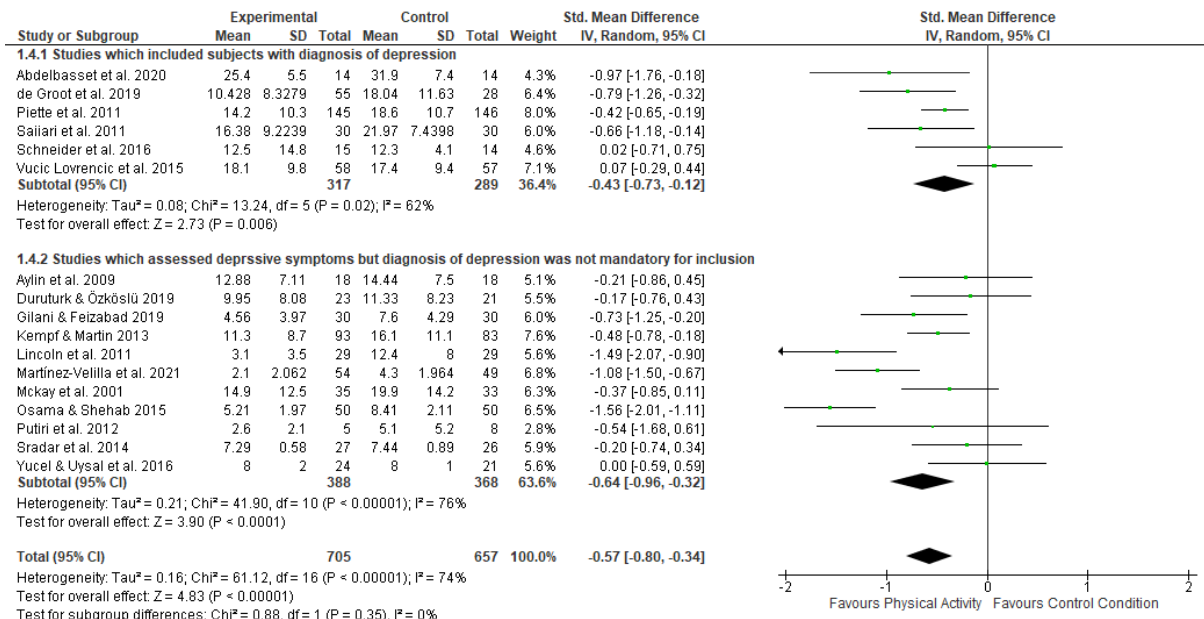
- 1 exp exercise/ or exp exercise therapy/ 286
- 2 exp Physical education/ or exp physical activity/ or exp Physical fitness/ 2860
- 3 exp Energy consumption/ 197
- 4 exp Walking/ 172
- 5 exp Running/ 13
- 6 exp Swimming/ 21
- 7 walk*.mp. 1368
- 8 run*.mp. 4887
- 9 swim*.mp. 149
- 10 (physical adj3 (activit* or educa* or train* or effort or fit* or work* or move* or
condit*)).mp. [mp=title, other title, abstract, heading words] 4048
- 11 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 10508
- 12 exp Depression/ 2866
- 13 exp Mental health/ 6609
- 14 depress*.mp. 6024
- 15 (mental* adj3 (ill* or disorder* or health or disease or diagnos* or condition or
symptom*)).mp. [mp=title, other title, abstract, heading words] 30439
- 16 (affective adj3 (ill* or disorder* or health or disease or diagnos* or condition or
symptom*)).mp. [mp=title, other title, abstract, heading words] 235
- 17 (psych* adj3 (ill* or disorder* or health or disease or diagnos* or condition or
symptom*)).mp. [mp=title, other title, abstract, heading words] 3207
- 18 (mood adj3 (ill* or disorder* or disease or diagnos* or condition or symptom*)).mp.
[mp=title, other title, abstract, heading words] 277
- 19 12 or 13 or 14 or 15 or 16 or 17 or 18 34998
- 20 exp Diabetes/ 2927
- 21 (diabet* adj3 ("2" or "II" or two*)).mp. [mp=title, other title, abstract, heading words]
1106
- 22 ((maturit* or adult* or slow*) adj3 diabet*).mp. [mp=title, other title, abstract,
heading words] 139

- 23 ((non-insulin* or non insulin* or noninsulin*) adj3 diabet*).mp. [mp=title, other title, abstract, heading words] 60
- 24 (NIDDM or T2DM or T2D).mp. [mp=title, other title, abstract, heading words] 105
- 25 (DM* adj3 ("2" or "II" or two*)).mp. [mp=title, other title, abstract, heading words] 23
- 26 20 or 21 or 22 or 23 or 24 or 25 3186
- 27 11 and 19 and 26 28

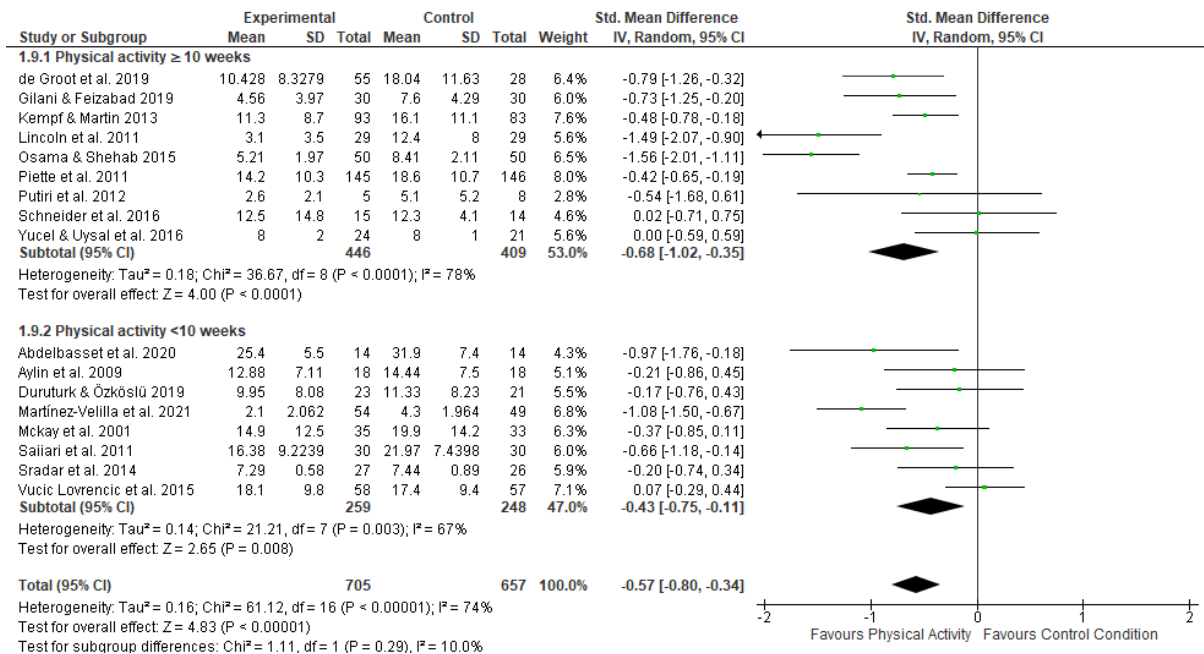
Appendix 2: Supplementary figures

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Abdelbasset et al. 2020	+	?	?	+	+	?	?
Aylin et al. 2009	?	?	?	?	?	?	?
de Groot et al. 2019	+	?	?	+	+	+	+
Duruturk et al. 2019	?	?	?	?	+	?	?
Gilani & Feizabad 2019	?	?	?	?	+	?	?
Kempf & Martin 2013	+	+	+	?	+	-	?
Krai Wong et al. 2021	?	?	?	+	?	?	?
Lincoln et al. 2011	?	?	?	?	+	?	?
Martínez-Velilla et al. 2021	+	?	-	+	+	+	?
Mckay et al. 2001	?	?	?	?	?	?	?
Osama & Shehab 2015	?	-	-	?	+	?	?
Piette et al. 2011	+	+	-	+	-	-	+
Putiri et al. 2012	?	?	?	?	-	?	?
Sailari et al. 2011	-	-	-	?	-	?	?
Schneider et al. 2016	+	+	-	+	+	+	+
Sradar et al. 2014	-	-	-	?	+	?	?
Vucic Lovrencic et al. 2015	+	?	-	+	+	+	+
Yucel & Uysal et al. 2016	+	?	-	?	-	?	?

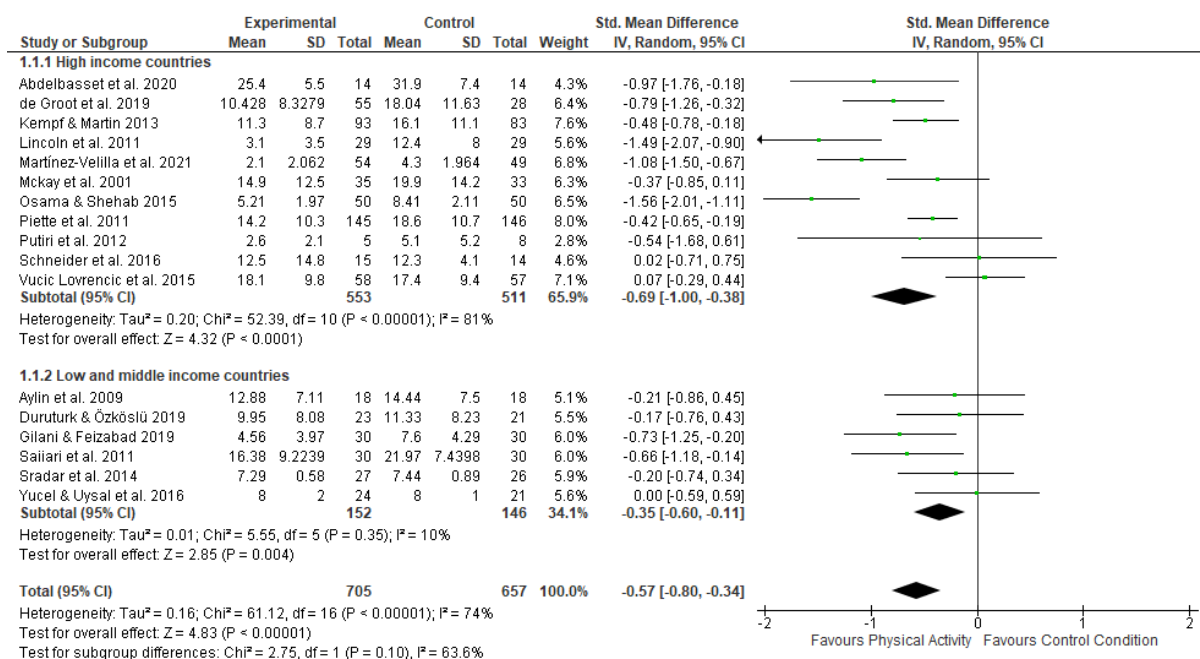
Supplementary Figure 1: Risk of bias summary



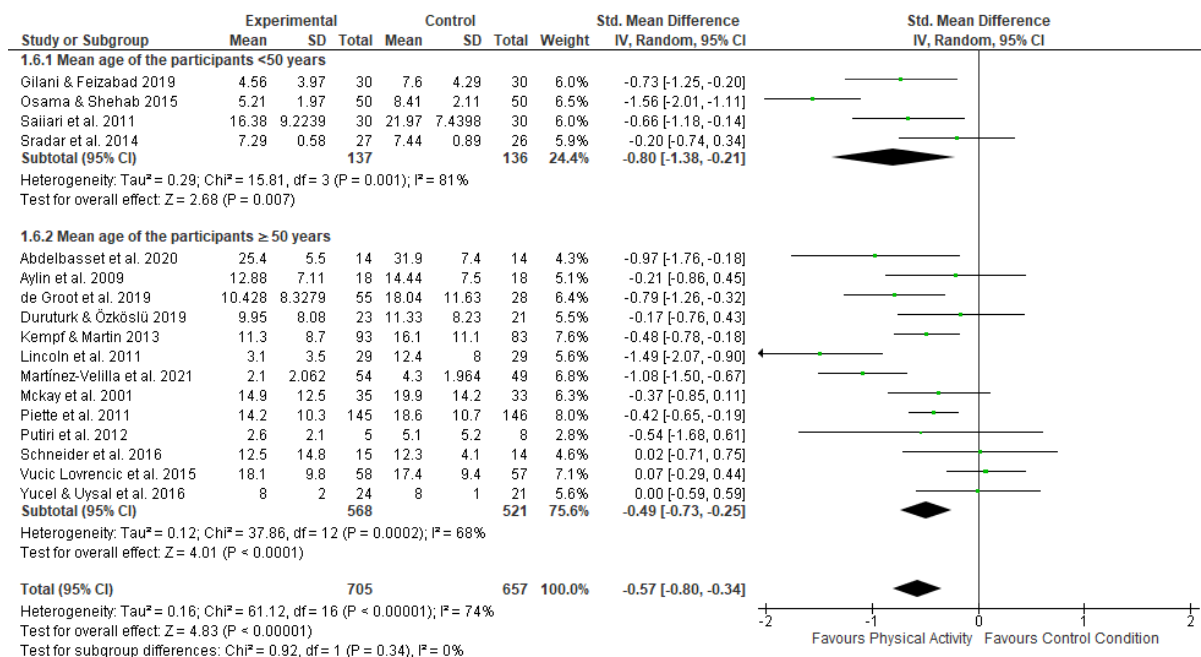
Supplementary Figure 2: Subgroup analysis for depression based on studies which included subjects with or without diagnosis of depression



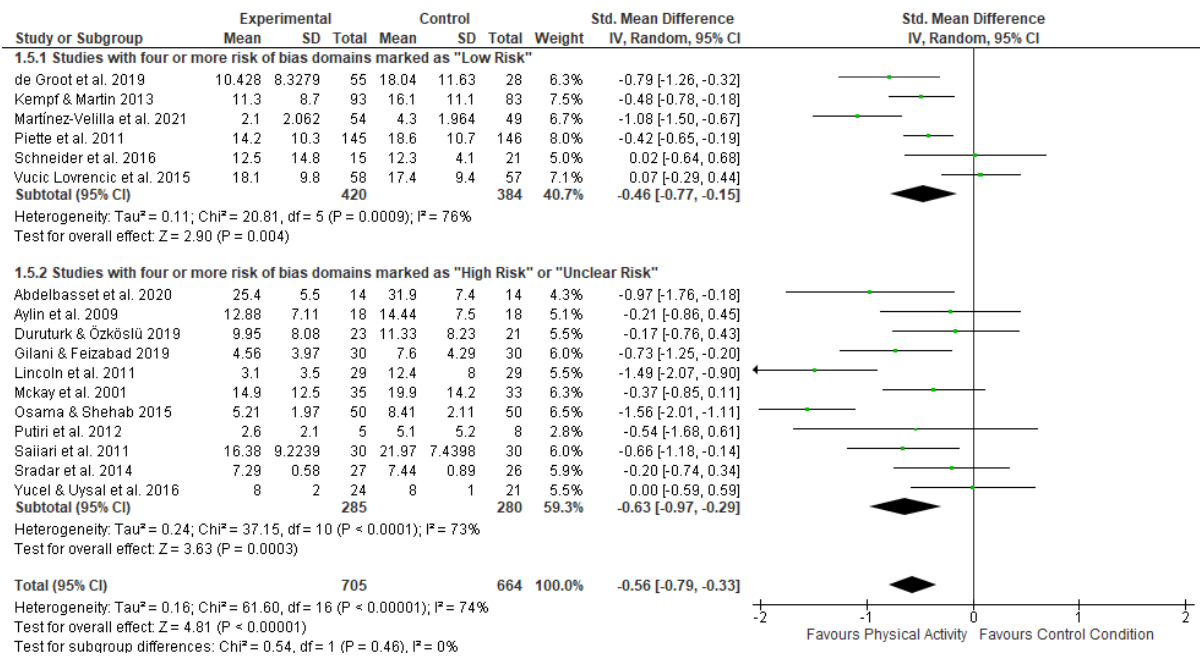
Supplementary Figure 3: Subgroup analysis for depression based on duration of physical activity



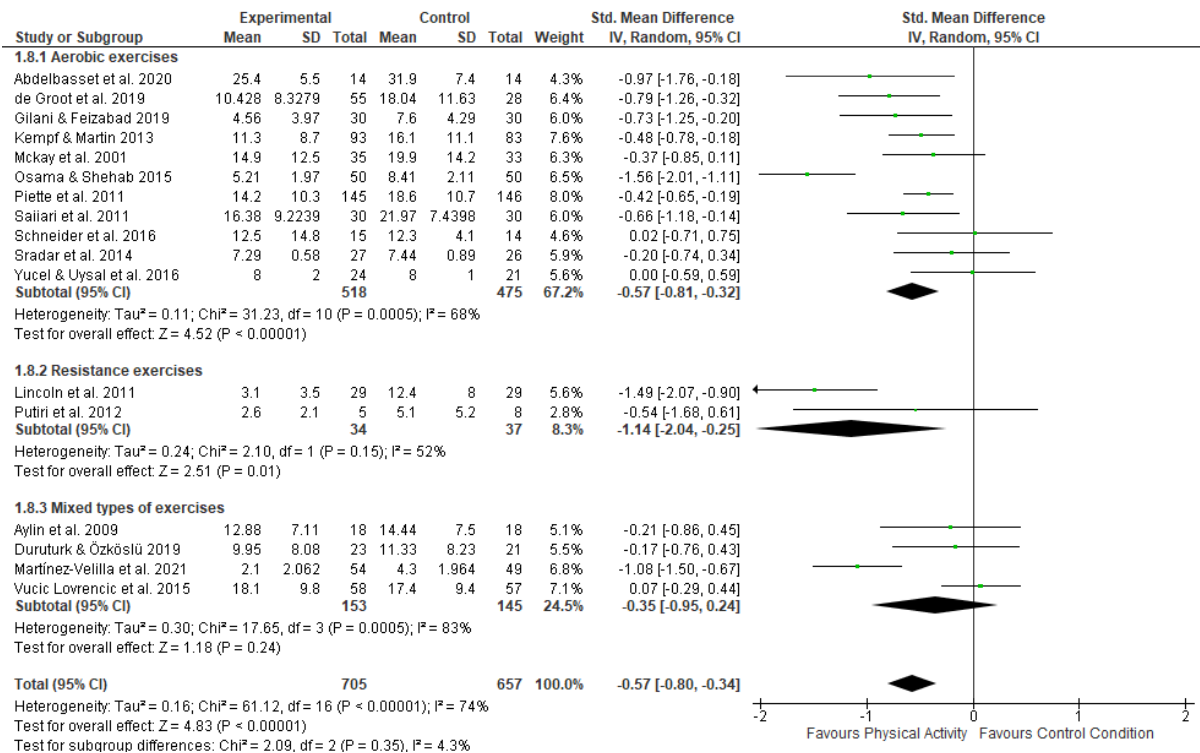
Supplementary Figure 4: Subgroup analysis for depression based on economic status of the country in which study was conducted



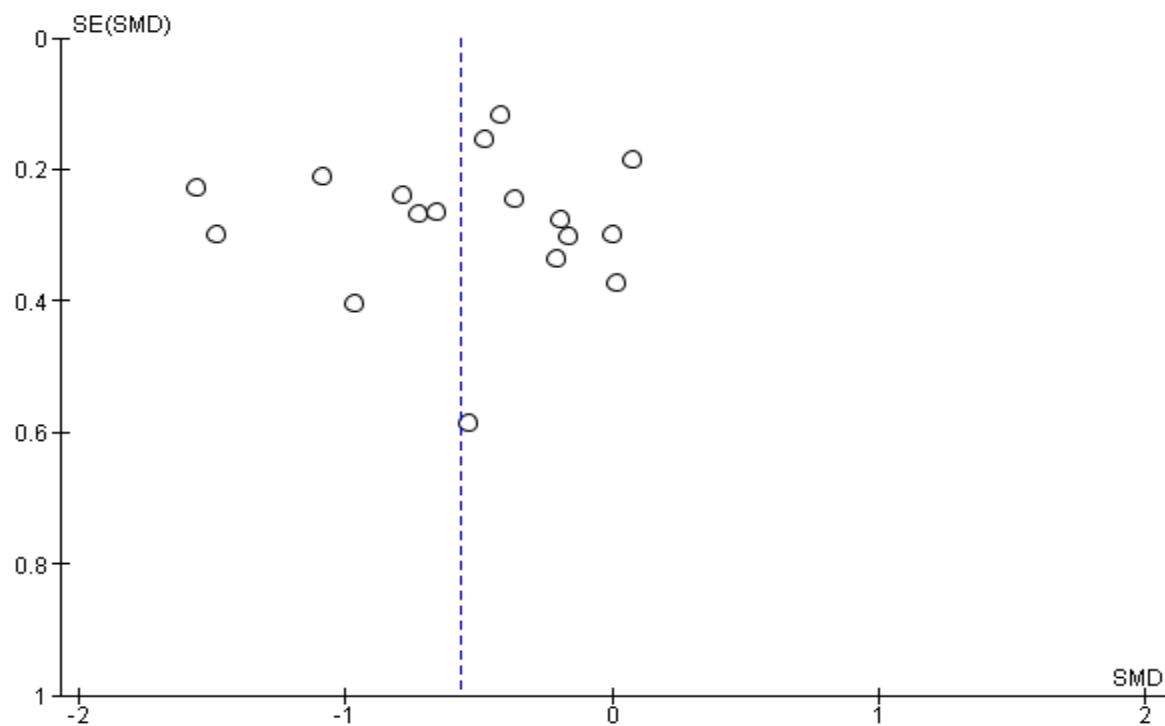
Supplementary Figure 5: Subgroup analysis for depression based on mean age of the participants



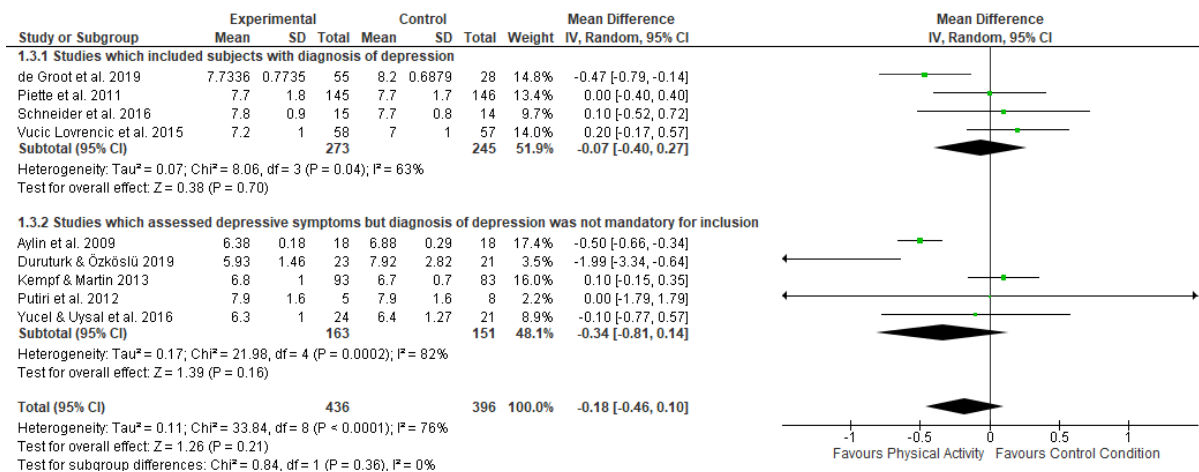
Supplementary Figure 6: Subgroup analysis for depression based on quality of the included studies



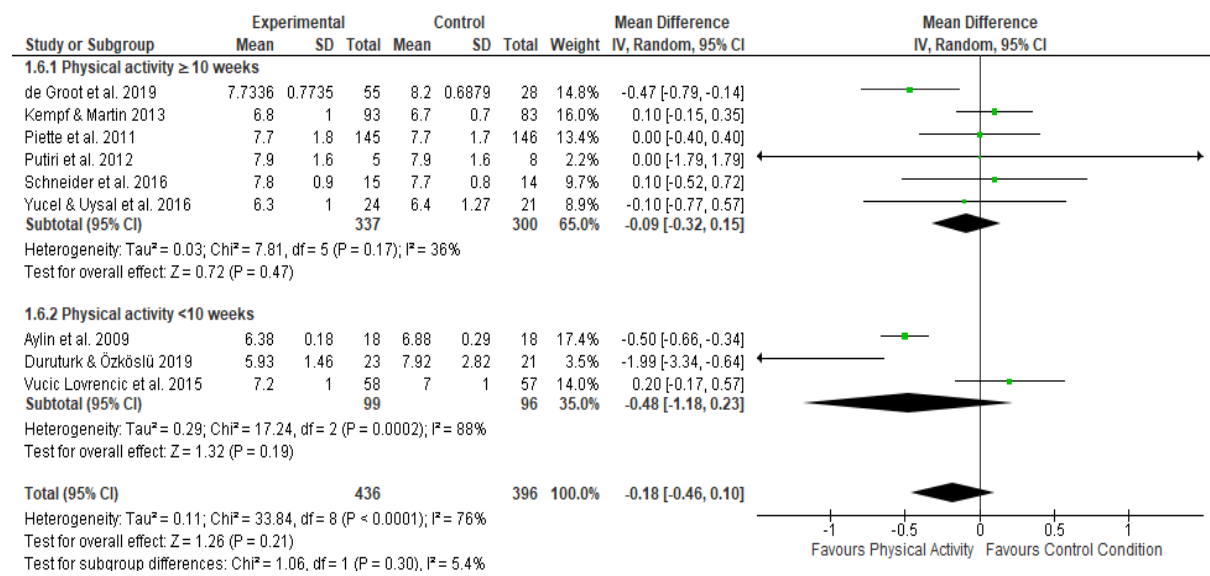
Supplementary Figure 7: Subgroup analysis for depression based on type of physical activity



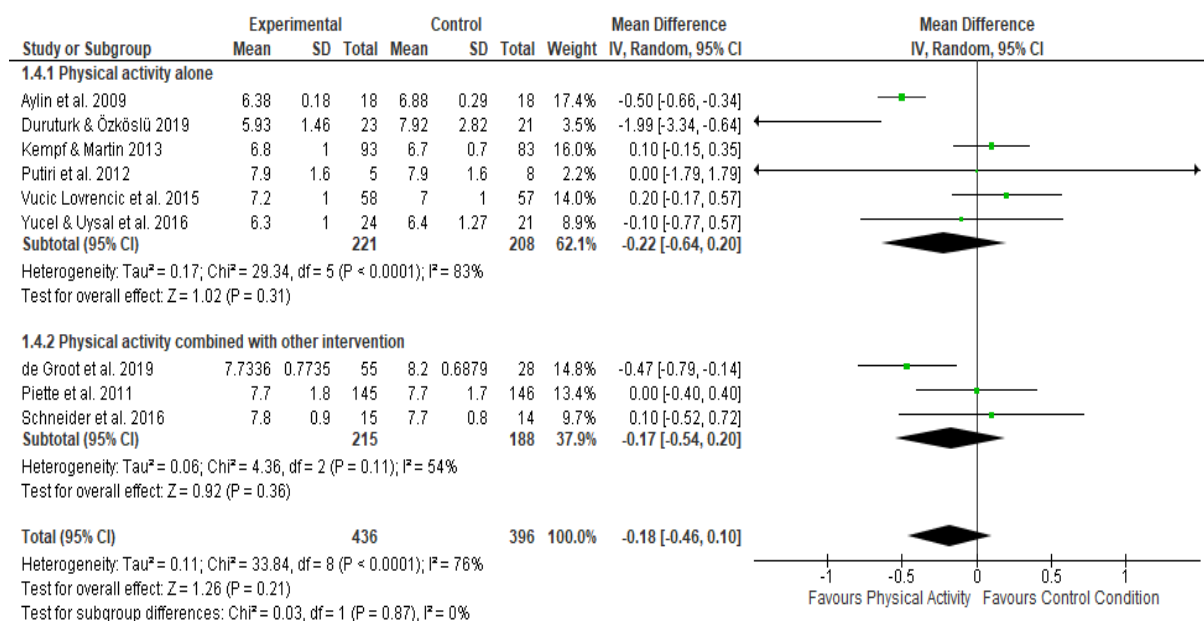
Supplementary Figure 8: Funnel plot of comparison for depression



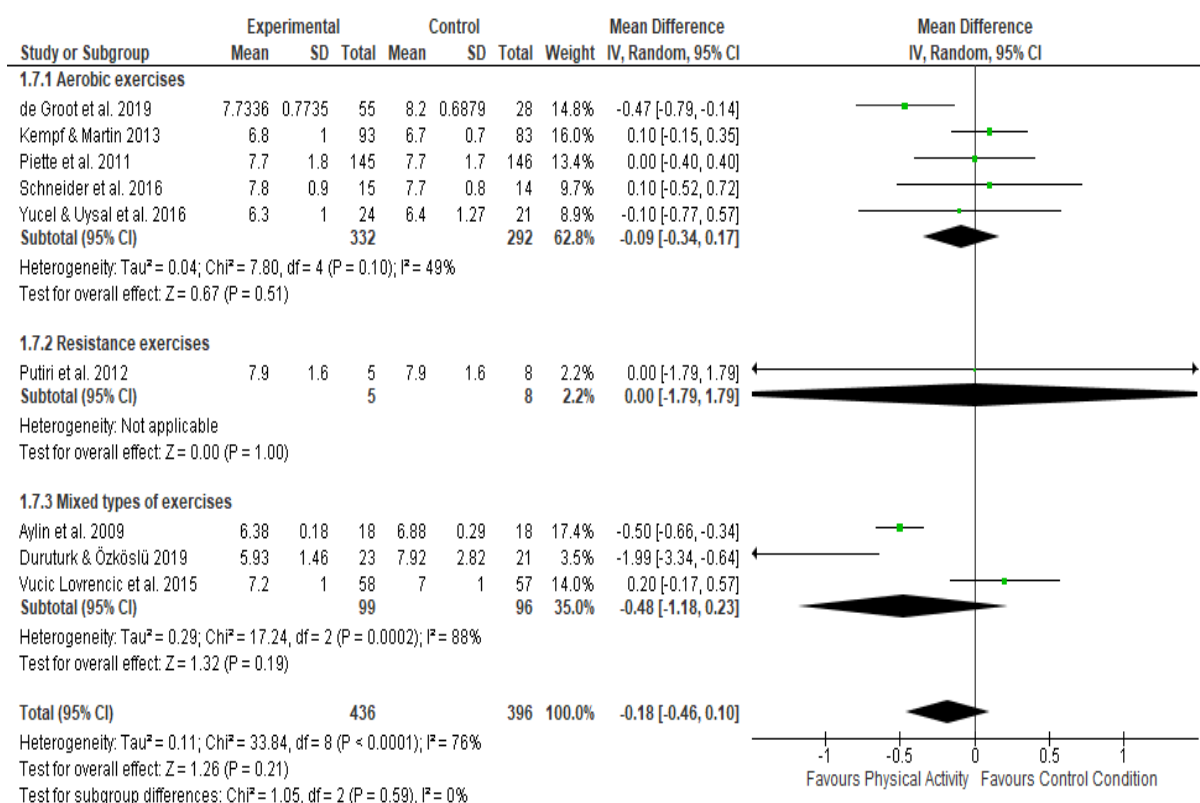
Supplementary Figure 9: Subgroup analysis for glycaemic control based on studies which included subjects with or without diagnosis of depression



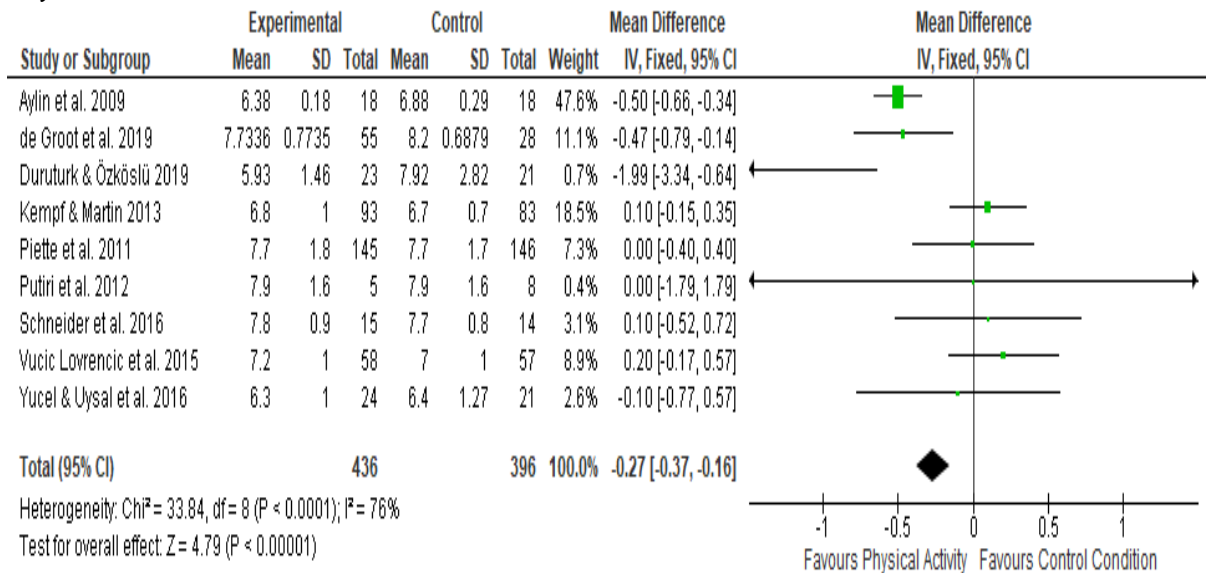
Supplementary Figure 10: Subgroup analysis for glycaemic control based on duration of physical activity



Supplementary Figure 11: Subgroup analysis for glycaemic control based on combining physical activity with other interventions



Supplementary Figure 12: Subgroup analysis for glycaemic control based on type of physical activity



Supplementary Figure 13: Forest plot of comparison for glycaemic control (Fixed effect model)

Appendix 3: Participant information sheets and consent forms of qualitative study

Participant information sheets: English version



Participant Information Sheet (Patient-Participants)

“Barriers & facilitators to physical activity in people with depression and type 2 diabetes mellitus in Pakistan: A qualitative study to explore perspectives of patient participants, carers and healthcare staff”

We would like to invite you to take part in the above-named study but before you decide, please read the following information.

What is the purpose of this study?

We are conducting a research study to explore experiences of patients, carers, and healthcare staff about combining a psychological treatment “Behavioural Activation” and physical activity for the treatment of diabetes and depression. Behavioural Activation focuses on enjoyable activities and can be used to treat depression, but it has little or no effect on blood sugar levels. On the other hand, physical activity has positive effects on controlling blood sugar levels and can tackle mental health issues as well, however, patients with diabetes and depression seldom take interest in physical activity. Behavioural Activation can be used to motivate patients to perform physical activity. Therefore, we want to develop an intervention to combine Behavioural Activation and physical activity, for which we need to better understand your experiences about the management of diabetes and depression.

Who is doing the study?

The study will be conducted by Aatik Arsh, who is PhD student at University of York, United Kingdom. The study is conducted as part of educational qualification.

Why have I been asked to participate?

To explore views, perceptions, and experiences of patients, carers, and healthcare staff about diabetes and depression management, we are conducting this study. You have

been identified as someone who has been diagnosed with diabetes and depression, therefore you are being invited to participate in the study.

Do I have to take part?

You do not have to participate in the study. It is up to you to decide whether to participate or not. The care that you receive won't change if you decide not to participate in the study. Your participation in the study will be voluntary. After understanding the information provided in this information sheet, we will provide a consent form, if you agree to participate in the study, you will have to fill the consent form and sign it (or put your thumb impression).

What will be involved if I take part in this study?

After signing the consent form, the researcher will schedule 40 to 60-minute interview with you. This can be at Khyber Medical University Peshawar, at a hospital from which you are receiving diabetes care or any another location that is convenient for you. The meeting can be at a time that suits you. During the interview, the researcher will ask you some questions about your experiences regarding the management of diabetes and depression. The interview will be conducted either in Urdu or Pashto, whichever suits you. The meeting will be informal and there will be no right or wrong answers.

With your permission, the interview will be audio-recorded. If you do not wish to be recorded, you can still participate in the study and tell us about your experiences. In this case we will take notes throughout the interview.

What are the advantages or benefits of taking part?

You may not have any direct benefits of taking part in the study, however, you will have an opportunity to discuss your healthcare experiences with the interviewer. In addition, the information you provide will be used to improve the care of diabetes and depression.

What are the disadvantages or risks of taking part?

It will take time to take part in the interview. You may have to travel to the location, where you want to give the interview. We will not be able to compensate any costs you incurred in taking part in the study.

You may become distressed whilst discussing your experiences during the interview. If you feel distressed or are not comfortable with the questions, you can stop the interview at any time. You can inform the interviewer if you need support.

Can I withdraw from the study at any time?

You are free to withdraw from the study at any time, without giving a reason. You do not have to answer any questions that you are not comfortable answering, and you can stop the interview at any time. If you withdraw, unless you object, we will use the information we collected from you up to the point you stop taking part. You can also withdraw your data, even after the completion of the interview. Nevertheless, we will be unable to withdraw your data once it is analysed.

The care that you receive won't change if you decide to withdraw yourself or your data from the study.

How will the information and personal data I give be handled?

We will treat any information you give us as confidential. We will store all your information safely and securely. We will remove all identifiable information from the collected data and the contents in the interview which can potentially disclose your identity, will be removed from the transcripts. The data collected in hard form will be kept in a locked cupboard at Khyber Medical University Peshawar. Electronic data will be password protected and will be held on a secure computer server at Khyber Medical University Peshawar. The data will be retained for 10 years and then will be destroyed according to University of York policy.

Please note that we will maintain confidentiality unless you disclose information that identifies a risk of harm to yourself or others. In that situation we will need to inform the PhD supervisor within the trust, who may contact you to arrange support or onward referral where needed. We would be happy to answer any questions you may have about how we use the information we receive from you as part of the study.

Through the following links, you can access to webpages which contain generic information about General Data Protection Regulation and data management

<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/>

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<https://www.york.ac.uk/records-management/dp/your-info/generalprivacynotice/>

What will happen to the results of the study?

The results of the study will be published in academic journals and will be presented in research conferences. The results of the study will be disseminated with the community members through short reports which will be shared via social media platforms and local magazines and newspapers.

Furthermore, the findings of the study will help to improve the care of diabetes and depression.

Who has reviewed and approved this study?

The University of York's Health Sciences Research Governance Committee United Kingdom and Ethics Board of Khyber Medical University Peshawar Pakistan have reviewed and granted ethical approval to the research project.

Who do I contact for more information about the study?

If you need any further information about the research project or have any queries about your participation, please feel free to contact

Dr. Aatik Arsh

Email: aa2723@york.ac.uk

[Mobile No.: 0344-6997046](tel:0344-6997046)

Who do I contact in the event of a complaint?

For general complaints, you can contact

Prof. Najma Siddiqi

Email: najma.siddiqi@york.ac.uk

Dr. Saima Afaq

Email: saima.afaq@york.ac.uk

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University of York Data Protection Officer at dataprotection@york.ac.uk

If you are unsatisfied with the response of above-mentioned authorities, you have the right to report concerns to the Information Commissioner's Office at www.ico.org.uk/concerns.

Thank you for taking the time to read this information sheet.

Participant Information Sheet (Carers)

“Barriers & facilitators to physical activity in people with depression and type 2 diabetes mellitus in Pakistan: A qualitative study to explore perspectives of patient participants, carers and healthcare staff”

We would like to invite you to take part in the above-named study but before you decide, please read the following information.

What is the purpose of this study?

We are conducting a research study to explore experiences of patients, carers, and healthcare staff about combining a psychological treatment “Behavioural Activation” and physical activity for the treatment of diabetes and depression. Behavioural Activation focuses on enjoyable activities and can be used to treat depression, but it has little or no effect on blood sugar levels. On the other hand, physical activity has positive effects on controlling blood sugar levels and can tackle mental health issues as well, however, patients with diabetes and depression seldom take interest in physical activity. Behavioural Activation can be used to motivate patients to perform physical activity. Therefore, we want to develop an intervention to combine Behavioural Activation and physical activity, for which we need to understand your experiences about the management of diabetes and depression.

Who is doing the study?

The study will be conducted by Aatik Arsh, who is PhD student at University of York, United Kingdom. The study is conducted as part of educational qualification.

Why have I been asked to participate?

To explore views, perceptions, and experiences of patients, carers, and healthcare staff about diabetes and depression management, we are conducting this study. You have been identified as someone who provides care to a family member with diagnosis of diabetes and depression, therefore you are being invited to participate in the study.

Do I have to take part?

You do not have to participate in the study. It is up to you to decide whether to participate or not. The care that your family member receive won't change if you decide not to participate in the study.

Your participation in the study will be voluntary. After understanding the information provided in this information sheet, we will provide a consent form, if you agree to participate in the study, you will have to fill the consent form and sign it (or put your thumb impression).

What will be involved if I take part in this study?

After signing the consent form, the researcher will schedule 40 to 60-minute interview with you. This can be at Khyber Medical University Peshawar, at a hospital from which your family member is receiving diabetes care or at any other location that is convenient for you. The meeting can be at a time that suits you. During the interview, the researcher will ask you some questions about your experiences regarding the management of diabetes and depression. The interview will be conducted either in Urdu or Pashto, whichever suits you. The meeting will be informal and there will be no right or wrong answers.

With your permission, the interview will be audio-recorded. If you do not wish to be recorded, you can still participate in the study and tell us about your experiences. In this case we will take notes throughout the interview.

What are the advantages or benefits of taking part?

You may not have any direct benefits of taking part in the study, however, you will have an opportunity to discuss your experiences with the interviewer. In addition, the information you provide will be used to improve the care of diabetes and depression.

What are the disadvantages or risks of taking part?

It will take time to take part in the interview. You may have to travel to the location, where you want to give the interview. We will not be able to compensate any costs you incurred in taking part in the study.

You may become distressed whilst discussing your experiences during the interview. If you feel distressed or are not comfortable with the questions, you can stop the interview at any time. You can inform the interviewer if you need support.

Can I withdraw from the study at any time?

You are free to withdraw from the study at any time, without giving a reason. You do not have to answer any questions that you are not comfortable answering, and you can stop the interview at any time. If you withdraw, unless you object, we will use the information we collected from you up to the point you stop taking part. You can also withdraw your data, even after the completion of the interview. Nevertheless, we will be unable to withdraw your data once it is analysed.

The care that you or your family member receive, won't change if you decide to withdraw yourself or your data from the study.

How will the information and personal data I give be handled?

We will treat any information you give us as confidential. We will store all your information safely and securely. We will remove all identifiable information from the collected data and the contents in the interview which can potentially disclose your identity, will be removed from the transcripts. The data collected in hard form will be kept in a locked cupboard at Khyber Medical University Peshawar. Electronic data will be password protected and will be held on a secure computer server at Khyber Medical University Peshawar. The data will be retained for 10 years and then will be destroyed according to University of York policy.

Please note that we will maintain confidentiality unless you disclose information that identifies a risk of harm to yourself or others. In that situation we will need to inform the PhD supervisor within the trust, who may contact you to arrange support or onward referral where needed. We would be happy to answer any questions you may have about how we use the information we receive from you as part of the study.

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What will happen to the results of the study?

The results of the study will be published in academic journals and will be presented in research conferences. The results of the study will be disseminated with the community members through short reports which will be shared via social media platforms and local magazines and newspapers.

Furthermore, the findings of the study will help to improve the care of diabetes and depression.

Who has reviewed and approved this study?

The University of York's Health Sciences Research Governance Committee United Kingdom and Ethics Board of Khyber Medical University Peshawar Pakistan have reviewed and granted ethical approval to the research project.

Who do I contact for more information about the study?

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Thank you for taking the time to read this information sheet.

Participant Information Sheet (Healthcare Staff)

“Barriers & facilitators to physical activity in people with depression and type 2 diabetes mellitus in Pakistan: A qualitative study to explore perspectives of patient participants, carers and healthcare staff”

We would like to invite you to take part in the above-named study but before you decide, please read the following information.

What is the purpose of this study?

We are conducting a research study to explore experiences of patients, carers, and healthcare staff about combining a psychological treatment “Behavioural Activation” and physical activity for the treatment of diabetes and depression. Behavioural Activation focuses on enjoyable activities and can be used to treat depression, but it has little or no effect on blood sugar levels. On the other hand, physical activity has positive effects on controlling blood sugar levels and can tackle mental health issues as well, however, patients with diabetes and depression seldom take interest in physical activity. Behavioural Activation can be used to motivate patients to perform physical activity. Therefore, we want to develop an intervention to combine Behavioural Activation and physical activity, for which we need to understand your experiences about the management of diabetes and depression.

Who is doing the study?

The study will be conducted by Aatik Arsh, who is PhD student at University of York, United Kingdom. The study is conducted as part of educational qualification.

Why have I been asked to participate?

To explore views, perceptions, and experiences of patients, carers, and healthcare staff about diabetes and depression management, we are conducting this study. You have been identified as healthcare staff who provides care to patients with diagnosis of diabetes and depression, therefore you are being invited to participate in the study.

Do I have to take part?

You do not have to participate in the study. It is up to you to decide whether to participate or not. Your employment will not be impacted if you decide not to participate in the study. Your participation in the study is voluntary. After understanding the information provided in this information sheet, we will provide a consent form, if you agree to participate in the study, you will have to fill the consent form and sign it (or put your thumb impression).

What will be involved if I take part in this study?

After signing the consent form, the researcher will schedule 40 to 60-minute interview with you. This can be at Khyber Medical University Peshawar, at a hospital in which you are working or any other location that is convenient for you. The meeting can be at a time that suits you. During the interview, the researcher will ask you some questions about your experiences regarding the management of diabetes and depression. The interview will be conducted either in Urdu or Pashto, whichever suits you. The meeting will be informal and there will be no right or wrong answers.

With your permission, the interview will be audio-recorded. If you do not wish to be recorded, you can still participate in the study and tell us about your experiences. In this case we will take notes throughout the interview.

What are the advantages or benefits of taking part?

You may not have any direct benefits of taking part in the study, however, you will have an opportunity to discuss your healthcare experiences with the interviewer. In addition, the information you provide will be used to improve the care of diabetes and depression.

What are the disadvantages or risks of taking part?

It will take time to take part in the interview. You may have to travel to the location, where you want to give the interview. We will not be able to compensate any costs you incurred in taking part in the study.

You may become distressed whilst discussing your experiences during the interview. If you feel distressed or are not comfortable with the questions, you can stop the interview at any time. You can inform the interviewer if you need support.

Can I withdraw from the study at any time?

You are free to withdraw from the study at any time, without giving a reason. You do not have to answer any questions that you are not comfortable answering, and you can stop the interview at any time. If you withdraw, unless you object, we will use the information we collected from you up to the point you stop taking part. You can also withdraw your data, even after the completion of the interview. Nevertheless, we will be unable to withdraw your data once it is analysed.

Your employment will not be impacted if you decide to withdraw yourself or your data from the study.

How will the information and personal data I give be handled?

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Please note that we will maintain confidentiality unless you disclose information that identifies a risk of harm to yourself or others. In that situation we will need to inform the PhD supervisor within the trust, who may contact you to arrange support or onward referral where needed. We would be happy to answer any questions you may have about how we use the information we receive from you as part of the study.

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What will happen to the results of the study?

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Furthermore, the findings of the study will help to improve the care of diabetes and depression.

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Who do I contact for more information about the study?

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If you are unsatisfied with the response of above-mentioned authorities, you have the right to report concerns to the Information Commissioner's Office at www.ico.org.uk/concerns.

Thank you for taking the time to read this information sheet.

Participant information sheets: Urdu version

UNIVERSITY of York

The Department of Health Sciences

معلوماتی خط برائے شرکاء (مریض شرکاء)

ہم آپ کو مذکورہ مطالعہ میں حصہ لینے کے لیے مدعو کرنا چاہتے ہیں لیکن اس سے پہلے کہ آپ فیصلہ کریں، براہ کرم درج ذیل معلومات کو پڑھیں۔

اس مطالعہ کا مقصد کیا ہے؟

ہم ایک تحقیقی مطالعہ کر رہے ہیں جس کا مقصد مریضوں، ان کے دیکھ بھال کرنے والوں، اور صحت کے عملے کا نفسیاتی علاج "ہیپورل ایکٹیویشن" اور جسمانی ورزشوں کا ذیابیطس اور ڈپریشن کے علاج میں استعمال کے بارے میں خیالات جاننا ہے۔ "ہیپورل ایکٹیویشن" خوشگوار سرگرمیوں پر مرکوز ہے اور اسے ڈپریشن کے علاج کے لیے استعمال کیا جاسکتا ہے، لیکن اس کا خون میں شوگر کی سطح پر بہت کم یا کوئی اثر نہیں ہوتا ہے۔ دوسری طرف، جسمانی ورزشیں خون میں شوگر کی سطح کو کنٹرول کرنے پر مثبت اثرات مرتب کرتی ہے اور ذہنی صحت کے مسائل سے بھی نمٹ سکتی ہے، تاہم، ذیابیطس اور ڈپریشن کے مریض شاذ و نادر ہی جسمانی سرگرمیوں میں دلچسپی لیتے ہیں۔ "ہیپورل ایکٹیویشن" کا استعمال مریضوں کو جسمانی ورزشیں انجام دینے کی ترغیب دینے کے لیے استعمال کیا جاسکتا ہے۔ لہذا، ہم "ہیپورل ایکٹیویشن" اور جسمانی ورزشوں کو یکجا کرنے کے لیے ایک طریقہ علاج تیار کرنا چاہتے ہیں، جس کے لیے ہمیں ذیابیطس اور ڈپریشن کے علاج کے بارے میں آپ کے تجربات کو بہتر طور پر سمجھنے کی ضرورت ہے۔

مطالعہ کون کر رہا ہے؟

یہ تحقیقی مطالعہ عاتک عرش کریں گے، جو یونیورسٹی آف یارک، برطانیہ میں پی ایچ ڈی کے طالب علم ہیں۔ یہ تحقیقی مطالعہ پی ایچ ڈی ڈگری کی تکمیل کے لیے کیے جانے والے تحقیق کا حصہ ہے۔

مجھے شرکت کے لیے کیوں کہا گیا ہے؟

ذیابیطس اور ڈپریشن کے علاج کے بارے میں مریضوں، ان کے دیکھ بھال کرنے والوں، اور صحت کے عملے کے خیالات، تاثرات اور تجربات کو دریافت کرنے کے لیے، ہم یہ مطالعہ کر رہے ہیں۔ آپ کی شناخت ایک ایسے شخص کے طور پر ہوئی ہے جو ذیابیطس اور ڈپریشن میں مبتلا ہے، اس لیے آپ کو مطالعہ میں شرکت کے لیے مدعو کیا جا رہا ہے۔

کیا اس تحقیقی مطالعہ میں حصہ لینا ضروری ہے؟

اس تحقیقی مطالعہ میں حصہ لینا ضروری نہیں ہے۔ حصہ لینے یا نہ لینے کا فیصلہ آپ پر ہے۔ اگر آپ مطالعہ میں حصہ نہ لینے کا فیصلہ کرتے ہیں تو آپ کو ملنے والی دیکھ بھال میں کوئی تبدیلی نہیں آئے گی۔ تحقیقی مطالعہ میں آپ کی شرکت رضاکارانہ ہوگی۔ اس معلوماتی خط میں فراہم کردہ معلومات کو سمجھنے کے بعد، ہم ایک رضامندی کا فارم فراہم کریں گے، اگر آپ مطالعہ میں حصہ لینے پر راضی ہیں، تو آپ کو رضامندی کا فارم پُر کرنا ہوگا اور اس پر دستخط کرنا ہوں گے (یا اپنے انگوٹھے کا نشان لگائیں گے)۔

اگر میں اس تحقیقی مطالعہ میں حصہ لوں تو مجھے کیا کرنا پڑے گا؟

رضامندی کے فارم پر دستخط کرنے کے بعد، محقق آپ کے ساتھ 40 سے 60 منٹ کا انٹرویو طے کرے گا۔ یہ انٹرویو خیبر میڈیکل یونیورسٹی پشاور میں ہو سکتا ہے، یا اس ہسپتال میں جہاں سے آپ ذیابیطس کا علاج کر رہے ہیں یا کوئی اور جگہ جو آپ کے لیے آسان ہو۔ ملاقات کی تاریخ اور وقت کا فیصلہ آپ کی سہولت اور

دستیابی کے مطابق کیا جائے گا۔ انٹرویو کے دوران، محقق آپ سے ذیابیطس اور ڈپریشن کے علاج کے حوالے سے آپ کے تجربات کے بارے میں کچھ سوالات پوچھے گا۔ انٹرویو اردو یا پشتو میں لیا جائے گا، جو آپ کے لیے مناسب ہو۔ ملاقات غیر رسمی ہوگی اور اس میں کوئی صحیح یا غلط جواب کا تصور نہیں ہوگا۔ آپ کی اجازت سے انٹرویو آڈیو ریکارڈ کیا جائے گا۔ اگر آپ انٹرویو ریکارڈ نہیں کرنا چاہتے تو پھر بھی آپ مطالعہ میں حصہ لے سکتے ہیں اور ہمیں اپنے تجربات کے بارے میں بتا سکتے ہیں۔ اس صورت میں ہم انٹرویو کے دوران نوٹس لیں گے۔

اس تحقیقی مطالعہ میں حصہ لینے کے کیا فوائد ہیں؟

آپ کو مطالعہ میں حصہ لینے کا کوئی براہ راست فائدہ نہیں ہوگا، تاہم، آپ کو انٹرویو لینے والے کے ساتھ اپنے صحت کی دیکھ بھال کے تجربات پر بات کرنے کا موقع ملے گا۔ اس کے علاوہ، آپ کی فراہم کردہ معلومات کا استعمال ذیابیطس اور ڈپریشن کے علاج کو بہتر بنانے کے لیے کیا جائے گا۔

تحقیقی مطالعہ میں حصہ لینے کے کیا نقصانات یا خطرات ہیں؟

تحقیقی مطالعہ میں حصہ لینے کی صورت میں انٹرویو کے لیے آپ کا وقت درکار ہوگا۔ آپ کو اس جگہ کا سفر کرنا پڑ سکتا ہے، جہاں آپ انٹرویو دینا چاہتے ہیں۔ ہم مطالعہ میں حصہ لینے کے لیے آپ کے کسی بھی اخراجات کی تلافی نہیں کر سکیں گے۔

انٹرویو کے دوران اپنے تجربات پر گفتگو کرتے ہوئے آپ پریشان ہو سکتے ہیں۔ اگر آپ پریشانی محسوس کرتے ہیں یا سوالات سے مطمئن نہیں ہیں، تو آپ کسی بھی وقت انٹرویو روک سکتے ہیں۔ اگر آپ کو مدد کی ضرورت ہو تو آپ انٹرویو لینے والے کو مطلع کر سکتے ہیں۔

کیا میں کسی بھی وقت تحقیقی مطالعہ سے دستبردار ہو سکتا ہوں؟

آپ بغیر وجہ بتائے کسی بھی وقت مطالعہ سے دستبردار ہونے کے لیے آزاد ہیں۔ آپ کو کسی ایسے سوال کا جواب دینے کی ضرورت نہیں ہے جس کا جواب دینے میں آپ پریشانی محسوس کرتے ہیں۔ اگر آپ دستبردار ہو جاتے ہیں، جب تک آپ اعتراض نہ کریں، ہم آپ سے جمع کی گئی معلومات کو اس وقت تک استعمال کر سکتے ہیں، جب تک آپ حصہ لینا بند کر دیں گے۔ حتیٰ کہ آپ انٹرویو مکمل ہونے کے بعد بھی آپ اپنا ڈیٹا واپس لے سکتے ہیں۔ لیکن آپ کے ڈیٹا کا تجزیہ کرنے کے بعد ہم اسے واپس نہیں لے سکیں گے۔

اگر آپ مطالعہ سے خود کو یا اپنے ڈیٹا کو واپس لینے کا فیصلہ کرتے ہیں تو آپ کو ملنے والی دیکھ بھال میں کوئی تبدیلی نہیں آئے گی۔

میں جو معلومات اور ذاتی ڈیٹا دیتا ہوں اسے کیسے استعمال کیا جائے گا؟

آپ جو بھی معلومات دیں گے ہم اسے رازدارانہ تصور کریں گے۔ ہم آپ کی فراہم کردہ تمام معلومات کو محفوظ طریقے سے سنبھالے گے۔ ہم جمع کردہ ڈیٹا سے تمام قابل شناخت معلومات کو ہٹا دیں گے اور انٹرویو میں موجود مواد جو ممکنہ طور پر آپ کی شناخت کو ظاہر کر سکتا ہے، کو دستاویزات سے ہٹا دیا جائے گا۔ آپ سے جمع کیے گئے دستاویزات کو خیبر میڈیکل یونیورسٹی پشاور میں ایک بند الماری میں رکھا جائے گا۔ الیکٹرانک ڈیٹا کو پاس ورڈ کے ذریعے محفوظ فولڈر میں رکھا جائے گا اور اسے خیبر میڈیکل یونیورسٹی پشاور کے ایک محفوظ کمپیوٹر سرور پر رکھا جائے گا۔ ڈیٹا کو 10 سال تک برقرار رکھا جائے گا اور پھر یونیورسٹی آف یارک کی پالیسی کے مطابق ضائع کر دیا جائے گا۔

براہ کرم نوٹ کریں کہ ہم آپ سے جمع کردہ معلومات کو اس وقت تک رازداری سے رکھیں گے جب تک کہ آپ ایسی معلومات کا انکشاف نہیں کرتے جو آپ کو یا دوسروں کو نقصان پہنچانے کے خطرے کی نشاندہی کرتی ہے۔ اس صورت حال میں ہم آپ کے اعتماد کو برقرار رکھتے ہوئے پی ایچ ڈی سپروائزر کو مطلع کریں گے، جو ضرورت پڑنے پر آپ سے رابطہ کر سکتی ہے۔ مطالعہ کے حصے کے طور پر آپ سے موصول ہونے والی معلومات کو ہم کس طرح استعمال کرتے ہیں اس بارے میں آپ کے کسی بھی سوال کا جواب دینے میں ہمیں خوشی ہوگی۔

درج ذیل لنکس کے ذریعے، آپ ان ویب صفحات تک رسائی حاصل کر سکتے ہیں جن میں جنرل ڈیٹا پروٹیکشن ریگولیشن اور ڈیٹا مینجمنٹ کے بارے میں عمومی معلومات موجود ہیں۔

<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/>

<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/research-participants/>

مزید معلومات کے لیے، آپ درج ذیل ویب صفحات کا مطالعہ کر سکتے ہیں۔

<https://www.york.ac.uk/records-management/dp/>

<https://www.york.ac.uk/records-management/dp/guidance/gdprcompliantresearch/>

<https://www.york.ac.uk/records-management/dp/your-info/generalprivacynotice/>

تحقیقی مطالعہ کے نتائج کا کیا ہوگا؟

تحقیقی مطالعہ کے نتائج تعلیمی جہان میں شائع کیے جائیں گے اور تحقیقی کانفرنسوں میں پیش کیے جائیں گے۔ تحقیقی مطالعہ کے نتائج کو معاشرے کے اراکین کے ساتھ مختصر رپورٹس کے ذریعے پھیلایا جائے گا جو سوشل میڈیا اور مقامی میگزینوں اور اخبارات کے ذریعے شیئر کیے جائیں گے۔ مزید برآں، مطالعہ کے نتائج ذیابیطس اور ڈپریشن کی دیکھ بھال کو بہتر بنانے میں مدد کریں گے۔

کس نے اس مطالعہ کا جائزہ لیا اور اس کی منظوری دی؟

یونیورسٹی آف یارک کی ہیلتھ سائنسز ریسرچ گورننس کمیٹی اور نیبر میڈیکل یونیورسٹی پشاور کے اخلاقیات بورڈ نے اس تحقیقی مطالعہ کا جائزہ لیا اور اسے منظوری دی۔

مطالعہ کے بارے میں مزید معلومات کے لیے میں کس سے رابطہ کروں؟

اگر آپ کو تحقیقی مطالعہ کے بارے میں مزید معلومات درکار ہوں یا آپ کی شرکت کے بارے میں کوئی سوال ہے تو براہ کرم بلا جھجھک ہم سے رابطہ کریں؛ ڈاکٹر عاتک عرش

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موبائل نمبر: 0344-6997046

شکایت کی صورت میں، میں کس سے رابطہ کروں؟

عام شکایات کے لیے آپ درج ذیل پی ایچ ڈی سپروائزرز سے رابطہ کر سکتے ہیں۔

پروفیسر نجمہ صدیقی

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اگر آپ اپنے ذاتی ڈیٹا کو سنبھالنے کے طریقے سے ناخوش ہیں، تو آپ یونیورسٹی آف یارک ڈیٹا پروٹیکشن آفیسر سے درج ذیل ای میل پر شکایت کر سکتے ہیں؛

dataprotection@york.ac.uk

اگر آپ مذکورہ بالا حکام کے جواب سے غیر مطمئن ہیں، تو آپ کو انفارمیشن کمشنر کے دفتر میں درج ذیل ویب سائٹ کے ذریعے تشویش کی اطلاع دینے کا حق ہے۔

www.ico.org.uk/concerns

اس معلوماتی خط کو پڑھنے کے لیے وقت نکالنے کے لیے آپ کا شکریہ۔

معلوماتی خط برائے شرکاء (مریضوں کے دیکھ بھال کرنے والے شرکاء)

ہم آپ کو مذکورہ مطالعہ میں حصہ لینے کے لیے مدعو کرنا چاہتے ہیں لیکن اس سے پہلے کہ آپ فیصلہ کریں، براہ کرم درج ذیل معلومات کو پڑھیں۔

اس مطالعہ کا مقصد کیا ہے؟

ہم ایک تحقیقی مطالعہ کر رہے ہیں جس کا مقصد مریضوں، ان کے دیکھ بھال کرنے والوں، اور صحت کے عملے کا نفسیاتی علاج "ہیپورل ایکٹیویشن" اور جسمانی ورزشوں کا ذیابیطس اور ڈپریشن کے علاج میں استعمال کے بارے میں خیالات جاننا ہے۔ "ہیپورل ایکٹیویشن" خوشگوار سرگرمیوں پر مرکوز ہے اور اسے ڈپریشن کے علاج کے لیے استعمال کیا جاسکتا ہے، لیکن اس کا خون میں شوگر کی سطح پر بہت کم یا کوئی اثر نہیں ہوتا ہے۔ دوسری طرف، جسمانی ورزشیں خون میں شوگر کی سطح کو کنٹرول کرنے پر مثبت اثرات مرتب کرتی ہے اور ذہنی صحت کے مسائل سے بھی نمٹ سکتی ہے، تاہم، ذیابیطس اور ڈپریشن کے مریض شاذ و نادر ہی جسمانی سرگرمیوں میں دلچسپی لیتے ہیں۔ "ہیپورل ایکٹیویشن" کا استعمال مریضوں کو جسمانی ورزشیں انجام دینے کی ترغیب دینے کے لیے استعمال کیا جاسکتا ہے۔ لہذا، ہم "ہیپورل ایکٹیویشن" اور جسمانی ورزشوں کو یکجا کرنے کے لیے ایک طریقہ علاج تیار کرنا چاہتے ہیں، جس کے لیے ہمیں ذیابیطس اور ڈپریشن کے علاج کے بارے میں آپ کے تجربات کو بہتر طور پر سمجھنے کی ضرورت ہے۔

- مطالعہ کون کر رہا ہے؟

یہ تحقیقی مطالعہ عاتک عرش کریں گے، جو یونیورسٹی آف یارک، برطانیہ میں پی ایچ ڈی کے طالب علم ہیں۔ یہ تحقیقی مطالعہ پی ایچ ڈی ڈگری کی تکمیل کے لیے کیے جانے والے تحقیق کا حصہ ہے۔

مجھے شرکت کے لیے کیوں کہا گیا ہے؟

ذیابیطس اور ڈپریشن کے علاج کے بارے میں مریضوں، ان کے دیکھ بھال کرنے والوں، اور صحت کے عملے کے خیالات، تاثرات اور تجربات کو دریافت کرنے کے لیے، ہم یہ مطالعہ کر رہے ہیں۔ چونکہ آپ ایک ایسے شخص کی دیکھ بھال کر رہے ہیں، جو ذیابیطس اور ڈپریشن کا شکار ہے، اس لیے آپ کو اس تحقیقی مطالعہ میں شرکت کے لیے مدعو کیا جا رہا ہے۔

کیا اس تحقیقی مطالعہ میں حصہ لینا ضروری ہے؟

اس تحقیقی مطالعہ میں حصہ لینا ضروری نہیں ہے۔ حصہ لینے یا نہ لینے کا فیصلہ آپ پر ہے۔ اگر آپ مطالعہ میں حصہ نہ لینے کا فیصلہ کرتے ہیں تو آپ کے خاندان کے رکن کو ملنے والی دیکھ بھال میں کوئی تبدیلی نہیں آئے گی۔

تحقیقی مطالعہ میں آپ کی شرکت رضاکارانہ ہوگی۔ اس معلوماتی خط میں فراہم کردہ معلومات کو سمجھنے کے بعد، ہم ایک رضامندی کا فارم فراہم کریں گے، اگر آپ مطالعہ میں حصہ لینے پر راضی ہیں، تو آپ کو رضامندی کا فارم پُر کرنا ہوگا اور اس پر دستخط کرنا ہوں گے (یا اپنے انگوٹھے کا نشان لگائیں گے)۔

اگر میں اس تحقیقی مطالعہ میں حصہ لوں تو مجھے کیا کرنا پڑے گا؟

رضامندی کے فارم پر دستخط کرنے کے بعد، محقق آپ کے ساتھ 40 سے 60 منٹ کا انٹرویو طے کرے گا۔ یہ انٹرویو خیبر میڈیکل یونیورسٹی پشاور میں ہو سکتا ہے، یا اس ہسپتال میں جہاں سے آپ ذیابیطس کا علاج کر رہے ہیں یا کوئی اور جگہ جو آپ کے لیے آسان ہو۔ ملاقات کی تاریخ اور وقت کا فیصلہ آپ کی سہولت اور

دستیابی کے مطابق کیا جائے گا۔ انٹرویو کے دوران، محقق آپ سے ذیابیطس اور ڈپریشن کے علاج کے حوالے سے آپ کے تجربات کے بارے میں کچھ سوالات پوچھے گا۔ انٹرویو اردو یا پشتو میں لیا جائے گا، جو آپ کے لیے مناسب ہو۔ ملاقات غیر رسمی ہوگی اور اس میں کوئی صحیح یا غلط جواب کا تصور نہیں ہوگا۔ آپ کی اجازت سے انٹرویو آڈیو ریکارڈ کیا جائے گا۔ اگر آپ انٹرویو ریکارڈ نہیں کرنا چاہتے تو پھر بھی آپ مطالعہ میں حصہ لے سکتے ہیں اور ہمیں اپنے تجربات کے بارے میں بتا سکتے ہیں۔ اس صورت میں ہم انٹرویو کے دوران نوٹس لیں گے۔

اس تحقیقی مطالعہ میں حصہ لینے کے کیا فوائد ہیں؟

آپ کو مطالعہ میں حصہ لینے کا کوئی براہ راست فائدہ نہیں ہوگا، تاہم، آپ کو انٹرویو لینے والے کے ساتھ اپنے تجربات پر بات کرنے کا موقع ملے گا۔ اس کے علاوہ، آپ کی فراہم کردہ معلومات کا استعمال ذیابیطس اور ڈپریشن کے علاج کو بہتر بنانے کے لیے کیا جائے گا۔

تحقیقی مطالعہ میں حصہ لینے کے کیا نقصانات یا خطرات ہیں؟

تحقیقی مطالعہ میں حصہ لینے کی صورت میں انٹرویو کے لیے آپ کا وقت درکار ہوگا۔ آپ کو اس جگہ کا سفر کرنا پڑ سکتا ہے، جہاں آپ انٹرویو دینا چاہتے ہیں۔ ہم مطالعہ میں حصہ لینے کے لیے آپ کے کسی بھی اخراجات کی تلافی نہیں کر سکیں گے۔ انٹرویو کے دوران اپنے تجربات پر گفتگو کرتے ہوئے آپ پریشان ہو سکتے ہیں۔ اگر آپ پریشانی محسوس کرتے ہیں یا سوالات سے مطمئن نہیں ہیں، تو آپ کسی بھی وقت انٹرویو روک سکتے ہیں۔ اگر آپ کو مدد کی ضرورت ہو تو آپ انٹرویو لینے والے کو مطلع کر سکتے ہیں۔

کیا میں کسی بھی وقت تحقیقی مطالعہ سے دستبردار ہو سکتا ہوں؟

آپ بغیر وجہ بتائے کسی بھی وقت مطالعہ سے دستبردار ہونے کے لیے آزاد ہیں۔ آپ کو کسی ایسے سوال کا جواب دینے کی ضرورت نہیں ہے جس کا جواب دینے میں آپ پریشانی محسوس کرتے ہیں۔ اگر آپ دستبردار ہو جاتے ہیں، جب تک آپ اعتراض نہ کریں، ہم آپ سے جمع کی گئی معلومات کو اس وقت تک استعمال کر سکتے ہیں، جب تک آپ حصہ لینا بند کر دیں گے۔ حتیٰ کہ آپ انٹرویو مکمل ہونے کے بعد بھی آپ اپنا ڈیٹا واپس لے سکتے ہیں۔ لیکن آپ کے ڈیٹا کا تجزیہ کرنے کے بعد ہم اسے واپس نہیں لے سکیں گے۔

اگر آپ مطالعہ سے اپنے آپ کو یا اپنے ڈیٹا کو واپس لینے کا فیصلہ کرتے ہیں تو آپ یا آپ کے خاندان کے ممبر کو جو دیکھ بھال ملتی ہے، اس میں کوئی تبدیلی نہیں آئے گی۔

میں جو معلومات اور ذاتی ڈیٹا دیتا ہوں اسے کیسے استعمال کیا جائے گا؟

آپ جو بھی معلومات دیں گے ہم اسے رازدارانہ تصور کریں گے۔ ہم آپ کی فراہم کردہ تمام معلومات کو محفوظ طریقے سے سنبھالے گے۔ ہم جمع کردہ ڈیٹا سے تمام قابل شناخت معلومات کو ہٹا دیں گے اور انٹرویو میں موجود مواد جو ممکنہ طور پر آپ کی شناخت کو ظاہر کر سکتا ہے، کو دستاویزات سے ہٹا دیا جائے گا۔ آپ سے جمع کیے گئے دستاویزات کو خیبر میڈیکل یونیورسٹی پشاور میں ایک بند الماری میں رکھا جائے گا۔ الیکٹرانک ڈیٹا کو پاس ورڈ کے ذریعے محفوظ فولڈر میں رکھا جائے گا اور اسے خیبر میڈیکل یونیورسٹی پشاور کے ایک محفوظ کمپیوٹر سرور پر رکھا جائے گا۔ ڈیٹا کو 10 سال تک برقرار رکھا جائے گا اور پھر یونیورسٹی آف یارک کی پالیسی کے مطابق ضائع کر دیا جائے گا۔

براہ کرم نوٹ کریں کہ ہم آپ سے جمع کردہ معلومات کو اس وقت تک رازداری سے رکھیں گے جب تک کہ آپ ایسی معلومات کا انکشاف نہیں کرتے جو آپ کو یا دوسروں کو نقصان پہنچانے کے خطرے کی نشاندہی کرتی ہے۔ اس صورت حال میں ہم آپ کے اعتماد کو برقرار رکھتے ہوئے پی ایچ ڈی سپروائزر کو مطلع کریں گے، جو ضرورت پڑنے پر آپ سے رابطہ کر سکتی ہے۔ مطالعہ کے حصے کے طور پر آپ سے موصول ہونے والی معلومات کو ہم کس طرح استعمال کرتے ہیں اس بارے میں آپ کے کسی بھی سوال کا جواب دینے میں ہمیں خوشی ہوگی۔

درج ذیل لنکس کے ذریعے، آپ ان ویب صفحات تک رسائی حاصل کر سکتے ہیں جن میں جنرل ڈیٹا پروٹیکشن ریگولیشن اور ڈیٹا مینجمنٹ کے بارے میں عمومی

معلومات موجود ہیں۔

<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/>
<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/research-participants/>

مزید معلومات کے لیے، آپ درج ذیل ویب صفحات کا مطالعہ کر سکتے ہیں۔

<https://www.york.ac.uk/records-management/dp/>
<https://www.york.ac.uk/records-management/dp/guidance/gdprcompliantresearch/>
<https://www.york.ac.uk/records-management/dp/your-info/generalprivacynotice/>

تحقیقی مطالعہ کے نتائج کا کیا ہوگا؟

تحقیقی مطالعہ کے نتائج تعلیمی جرائد میں شائع کیے جائیں گے اور تحقیقی کانفرنسوں میں پیش کیے جائیں گے۔ تحقیقی مطالعہ کے نتائج کو معاشرے کے اراکین کے ساتھ مختصر رپورٹس کے ذریعے پھیلا دیا جائے گا جو سوشل میڈیا اور مقامی میگزینوں اور اخبارات کے ذریعے شیئر کیے جائیں گے۔ مزید برآں، مطالعہ کے نتائج ڈیپریٹس اور ڈپریشن کی دیکھ بھال کو بہتر بنانے میں مدد کریں گے۔

کس نے اس مطالعہ کا جائزہ لیا اور اس کی منظوری دی؟

یونیورسٹی آف یارک کی ہیلتھ سائنسز ریسرچ گورننس کمیٹی اور خیبر میڈیکل یونیورسٹی پشاور کے اخلاقیات بورڈ نے اس تحقیقی مطالعہ کا جائزہ لیا اور اسے منظوری دی۔
مطالعہ کے بارے میں مزید معلومات کے لیے میں کس سے رابطہ کروں؟

اگر آپ کو تحقیقی مطالعہ کے بارے میں مزید معلومات درکار ہوں یا آپ کی شرکت کے بارے میں کوئی سوال ہے تو براہ کرم بلا جھجھک ہم سے رابطہ کریں؛
ڈاکٹر عاتک عرش

ای میل: aa2723@york.ac.uk

موبائل نمبر: 0344-6997046

شکایت کی صورت میں، میں کس سے رابطہ کروں؟

عام شکایات کے لیے آپ درج ذیل پی ایچ ڈی سپروائزر سے رابطہ کر سکتے ہیں۔
پروفیسر نجمہ صدیقی

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ای میل: saima.afaq@york.ac.uk

اگر آپ اپنے ذاتی ڈیٹا کو سنبھالنے کے طریقے سے ناخوش ہیں، تو آپ یونیورسٹی آف یارک ڈیٹا پروٹیکشن آفیسر سے درج ذیل ای میل پر شکایت کر سکتے ہیں؛

dataprotection@york.ac.uk

اگر آپ مذکورہ بالا حکام کے جواب سے غیر مطمئن ہیں، تو آپ کو انفارمیشن کمشنر کے دفتر میں درج ذیل ویب سائٹ کے ذریعے تشویش کی اطلاع دینے کا حق ہے؛ -

www.ico.org.uk/concerns

اس معلوماتی خط کو پڑھنے کے لیے وقت نکالنے کے لیے آپ کا شکریہ۔

معلوماتی خط برائے شرکاء (صحت کا عملہ)

ہم آپ کو مذکورہ مطالعہ میں حصہ لینے کے لیے مدعو کرنا چاہتے ہیں لیکن اس سے پہلے کہ آپ فیصلہ کریں، براہ کرم درج ذیل معلومات کو پڑھیں۔

اس مطالعہ کا مقصد کیا ہے؟

ہم ایک تحقیقی مطالعہ کر رہے ہیں جس کا مقصد مریضوں، ان کے دیکھ بھال کرنے والوں، اور صحت کے عملے کا نفسیاتی علاج "ہیپورل ایکٹیویشن" اور جسمانی ورزشوں کا ذیابیطس اور ڈپریشن کے علاج میں استعمال کے بارے میں خیالات جاننا ہے۔ "ہیپورل ایکٹیویشن" خوشگوار سرگرمیوں پر مرکوز ہے اور اسے ڈپریشن کے علاج کے لیے استعمال کیا جاسکتا ہے، لیکن اس کا خون میں شوگر کی سطح پر بہت کم یا کوئی اثر نہیں ہوتا ہے۔ دوسری طرف، جسمانی ورزشیں خون میں شوگر کی سطح کو کنٹرول کرنے پر مثبت اثرات مرتب کرتی ہے اور ذہنی صحت کے مسائل سے بھی نمٹ سکتی ہے، تاہم، ذیابیطس اور ڈپریشن کے مریض شاذ و نادر ہی جسمانی سرگرمیوں میں دلچسپی لیتے ہیں۔ "ہیپورل ایکٹیویشن" کا استعمال مریضوں کو جسمانی ورزشیں انجام دینے کی ترغیب دینے کے لیے استعمال کیا جاسکتا ہے۔ لہذا، ہم "ہیپورل ایکٹیویشن" اور جسمانی ورزشوں کو یکجا کرنے کے لیے ایک طریقہ علاج تیار کرنا چاہتے ہیں، جس کے لیے ہمیں ذیابیطس اور ڈپریشن کے علاج کے بارے میں آپ کے تجربات کو بہتر طور پر سمجھنے کی ضرورت ہے۔

مطالعہ کون کر رہا ہے؟

یہ تحقیقی مطالعہ عاتک عرش کریں گے، جو یونیورسٹی آف یارک، برطانیہ میں پی ایچ ڈی کے طالب علم ہیں۔ یہ تحقیقی مطالعہ پی ایچ ڈی ڈگری کی تکمیل کے لیے کیے جانے والے تحقیق کا حصہ ہے۔

مجھے شرکت کے لیے کیوں کہا گیا ہے؟

ذیابیطس اور ڈپریشن کے علاج کے بارے میں مریضوں، ان کے دیکھ بھال کرنے والوں، اور صحت کے عملے کے خیالات، تاثرات اور تجربات کو دریافت کرنے کے لیے، ہم یہ مطالعہ کر رہے ہیں۔ آپ کی شناخت صحت کی دیکھ بھال کرنے والے عملے کے طور پر ہوئی ہے جو ذیابیطس اور ڈپریشن کی تشخیص والے مریضوں کی دیکھ بھال کرتا ہے، اس لیے آپ کو مطالعہ میں شرکت کے لیے مدعو کیا جا رہا ہے۔

کیا اس تحقیقی مطالعہ میں حصہ لینا ضروری ہے؟

اس تحقیقی مطالعہ میں حصہ لینا ضروری نہیں ہے۔ حصہ لینے یا نہ لینے کا فیصلہ آپ پر ہے۔ اگر آپ مطالعہ میں حصہ نہ لینے کا فیصلہ کرتے ہیں تو آپ کی ملازمت پر کوئی اثر نہیں پڑے گا۔ تحقیقی مطالعہ میں آپ کی شرکت رضاکارانہ ہوگی۔ اس معلوماتی خط میں فراہم کردہ معلومات کو سمجھنے کے بعد، ہم ایک رضامندی کا فارم فراہم کریں گے، اگر آپ مطالعہ میں حصہ لینے پر راضی ہیں، تو آپ کو رضامندی کا فارم پُر کرنا ہوگا اور اس پر دستخط کرنا ہوں گے (یا اپنے انگوٹھے کا نشان لگائیں گے)۔

اگر میں اس تحقیقی مطالعہ میں حصہ لوں تو مجھے کیا کرنا پڑے گا؟

رضامندی کے فارم پر دستخط کرنے کے بعد، محقق آپ کے ساتھ 40 سے 60 منٹ کا انٹرویو طے کرے گا۔ یہ انٹرویو خیبر میڈیکل یونیورسٹی پشاور میں ہو سکتا ہے، یا اس ہسپتال میں جہاں سے آپ ذیابیطس کا علاج کر رہے ہیں یا کوئی اور جگہ جو آپ کے لیے آسان ہو۔ ملاقات کی تاریخ اور وقت کا فیصلہ آپ کی سہولت اور

دستیابی کے مطابق کیا جائے گا۔ انٹرویو کے دوران، محقق آپ سے ذیابیطس اور ڈپریشن کے علاج کے حوالے سے آپ کے تجربات کے بارے میں کچھ سوالات پوچھے گا۔ انٹرویو اردو یا پشتو میں لیا جائے گا، جو آپ کے لیے مناسب ہو۔ ملاقات غیر رسمی ہوگی اور اس میں کوئی صحیح یا غلط جواب کا تصور نہیں ہوگا۔ آپ کی اجازت سے انٹرویو آڈیو ریکارڈ کیا جائے گا۔ اگر آپ انٹرویو ریکارڈ نہیں کرنا چاہتے تو پھر بھی آپ مطالعہ میں حصہ لے سکتے ہیں اور ہمیں اپنے تجربات کے بارے میں بتا سکتے ہیں۔ اس صورت میں ہم انٹرویو کے دوران نوٹس لیں گے۔

اس تحقیقی مطالعہ میں حصہ لینے کے کیا فوائد ہیں؟

آپ کو مطالعہ میں حصہ لینے کا کوئی براہ راست فائدہ نہیں ہوگا، تاہم، آپ کو انٹرویو لینے والے کے ساتھ اپنے تجربات پر بات کرنے کا موقع ملے گا۔ اس کے علاوہ، آپ کی فراہم کردہ معلومات کا استعمال ذیابیطس اور ڈپریشن کے علاج کو بہتر بنانے کے لیے کیا جائے گا۔

تحقیقی مطالعہ میں حصہ لینے کے کیا نقصانات یا خطرات ہیں؟

تحقیقی مطالعہ میں حصہ لینے کی صورت میں انٹرویو کے لیے آپ کا وقت درکار ہوگا۔ آپ کو اس جگہ کا سفر کرنا پڑ سکتا ہے، جہاں آپ انٹرویو دینا چاہتے ہیں۔ ہم مطالعہ میں حصہ لینے کے لیے آپ کے کسی بھی اخراجات کی تلافی نہیں کر سکیں گے۔ انٹرویو کے دوران اپنے تجربات پر گفتگو کرتے ہوئے آپ پریشان ہو سکتے ہیں۔ اگر آپ پریشانی محسوس کرتے ہیں یا سوالات سے مطمئن نہیں ہیں، تو آپ کسی بھی وقت انٹرویو روک سکتے ہیں۔ اگر آپ کو مدد کی ضرورت ہو تو آپ انٹرویو لینے والے کو مطلع کر سکتے ہیں۔

کیا میں کسی بھی وقت تحقیقی مطالعہ سے دستبردار ہو سکتا ہوں؟

آپ بغیر وجہ بتائے کسی بھی وقت مطالعہ سے دستبردار ہونے کے لیے آزاد ہیں۔ آپ کو کسی ایسے سوال کا جواب دینے کی ضرورت نہیں ہے جس کا جواب دینے میں آپ پریشانی محسوس کرتے ہیں۔ اگر آپ دستبردار ہو جاتے ہیں، جب تک آپ اعتراض نہ کریں، ہم آپ سے جمع کی گئی معلومات کو اس وقت تک استعمال کر سکتے ہیں، جب تک آپ حصہ لینا بند کر دیں گے۔ حتیٰ کہ آپ انٹرویو مکمل ہونے کے بعد بھی آپ اپنا ڈیٹا واپس لے سکتے ہیں۔ لیکن آپ کے ڈیٹا کا تجزیہ کرنے کے بعد ہم اسے واپس نہیں لے سکیں گے۔

اگر آپ مطالعہ سے خود کو یا اپنے ڈیٹا کو واپس لینے کا فیصلہ کرتے ہیں تو آپ کی ملازمت پر کوئی اثر نہیں پڑے گا۔

میں جو معلومات اور ذاتی ڈیٹا دیتا ہوں اسے کیسے استعمال کیا جائے گا؟

آپ جو بھی معلومات دیں گے ہم اسے رازدارانہ تصور کریں گے۔ ہم آپ کی فراہم کردہ تمام معلومات کو محفوظ طریقے سے سنبھالے گے۔ ہم جمع کردہ ڈیٹا سے تمام قابل شناخت معلومات کو ہٹا دیں گے اور انٹرویو میں موجود مواد جو ممکنہ طور پر آپ کی شناخت کو ظاہر کر سکتا ہے، کو دستاویزات سے ہٹا دیا جائے گا۔ آپ سے جمع کیے گئے دستاویزات کو خیبر میڈیکل یونیورسٹی پشاور میں ایک بند الماری میں رکھا جائے گا۔ الیکٹرانک ڈیٹا کو پاس ورڈ کے ذریعے محفوظ فولڈر میں رکھا جائے گا اور اسے خیبر میڈیکل یونیورسٹی پشاور کے ایک محفوظ کمپیوٹر سرور پر رکھا جائے گا۔ ڈیٹا کو 10 سال تک برقرار رکھا جائے گا اور پھر یونیورسٹی آف یارک کی پالیسی کے مطابق ضائع کر دیا جائے گا۔

براہ کرم نوٹ کریں کہ ہم آپ سے جمع کردہ معلومات کو اس وقت تک رازداری سے رکھیں گے جب تک کہ آپ ایسی معلومات کا انکشاف نہیں کرتے جو آپ کو یا دوسروں کو نقصان پہنچانے کے خطرے کی نشاندہی کرتی ہے۔ اس صورت حال میں ہم آپ کے اعتماد کو برقرار رکھتے ہوئے پی ایچ ڈی سپروائزر کو مطلع کریں گے، جو ضرورت پڑنے پر آپ سے رابطہ کر سکتی ہے۔ مطالعہ کے حصے کے طور پر آپ سے موصول ہونے والی معلومات کو ہم کس طرح استعمال کرتے ہیں اس بارے میں آپ کے کسی بھی سوال کا جواب دینے میں ہمیں خوشی ہوگی۔

درج ذیل لنکس کے ذریعے، آپ ان ویب صفحات تک رسائی حاصل کر سکتے ہیں جن میں جنرل ڈیٹا پروٹیکشن ریگولیشن اور ڈیٹا مینجمنٹ کے بارے میں عمومی معلومات موجود ہیں۔

<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/>

<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/research-participants/>

مزید معلومات کے لیے، آپ درج ذیل ویب صفحات کا مطالعہ کر سکتے ہیں۔

<https://www.york.ac.uk/records-management/dp/>

<https://www.york.ac.uk/records-management/dp/guidance/gdprcompliantresearch/>

<https://www.york.ac.uk/records-management/dp/your-info/generalprivacynotice/>

تحقیقی مطالعہ کے نتائج کا کیا ہوگا؟

تحقیقی مطالعہ کے نتائج تعلیمی جہان میں شائع کیے جائیں گے اور تحقیقی کانفرنسوں میں پیش کیے جائیں گے۔ تحقیقی مطالعہ کے نتائج کو معاشرے کے اراکین کے ساتھ مختصر رپورٹس کے ذریعے پھیلایا جائے گا جو سوشل میڈیا اور مقامی میگزینوں اور اخبارات کے ذریعے شیئر کیے جائیں گے۔ مزید برآں، مطالعہ کے نتائج ذیابیطس اور ڈپریشن کی دیکھ بھال کو بہتر بنانے میں مدد کریں گے۔

کس نے اس مطالعہ کا جائزہ لیا اور اس کی منظوری دی؟

یونیورسٹی آف یارک کی ہیلتھ سائنسز ریسرچ گورننس کمیٹی اور نیبر میڈیکل یونیورسٹی پشاور کے اخلاقیات بورڈ نے اس تحقیقی مطالعہ کا جائزہ لیا اور اسے منظوری دی۔

مطالعہ کے بارے میں مزید معلومات کے لیے میں کس سے رابطہ کروں؟

اگر آپ کو تحقیقی مطالعہ کے بارے میں مزید معلومات درکار ہوں یا آپ کی شرکت کے بارے میں کوئی سوال ہے تو براہ کرم بلا جھجھک ہم سے رابطہ کریں؛ ڈاکٹر عاتک عرش

ای میل: aa2723@york.ac.uk

موبائل نمبر: 0344-6997046

شکایت کی صورت میں، میں کس سے رابطہ کروں؟

عام شکایات کے لیے آپ درج ذیل پی ایچ ڈی سپروائزرز سے رابطہ کر سکتے ہیں۔

پروفیسر نجمہ صدیقی

ای میل: najma.siddiqi@york.ac.uk

ڈاکٹر صائمہ آفاق

ای میل: saima.afaq@york.ac.uk

اگر آپ اپنے ذاتی ڈیٹا کو سنبھالنے کے طریقے سے ناخوش ہیں، تو آپ یونیورسٹی آف یارک ڈیٹا پروٹیکشن آفیسر سے درج ذیل ای میل پر شکایت کر سکتے ہیں؛

dataprotection@york.ac.uk

اگر آپ مذکورہ بالا حکام کے جواب سے غیر مطمئن ہیں، تو آپ کو انفارمیشن کمشنر کے دفتر میں درج ذیل ویب سائٹ کے ذریعے تشویش کی اطلاع دینے کا حق ہے۔

www.ico.org.uk/concerns

اس معلوماتی خط کو پڑھنے کے لیے وقت نکالنے کے لیے آپ کا شکریہ۔

Participant consent form: English version



Participant Consent Form

“Barriers & facilitators to physical activity in people with depression and type 2 diabetes mellitus in Pakistan: A qualitative study to explore perspectives of patient participants, carers and healthcare staff”

	Please confirm agreement to each statement by putting (✓) in the boxes below
I have read and understood the participant information sheet [dated 20 th April 2022, version 1.1]	
I have had the opportunity to ask questions and discuss this study	
I have received satisfactory answers to all of my questions	
I have received enough information about the study	
I understand my participation in the study is voluntary and that I am free to withdraw from the study: At any time Without having to give a reason for withdrawing If I withdraw, unless I object, the researchers can use the information they collected from me up to the point I stop taking part.	
I understand that any information I provide, including personal data, will be kept confidential, stored securely and only accessed by those carrying out the study.	

I understand that any information I give may be included in published documents, but all information will be anonymised.		
I agree to take part in this study		
In addition to these questions please confirm whether you agree with the following statements. Your participation in this research study will not be affected if you do not agree with this statement: Are you happy for the interview to be audio-recorded?		
	Yes	No
Participant Signature 		
Date		
Name of Participant		
Researcher Signature 		
Date		
Name of Researcher		

Date: 20th April 2022

Version 1.1

Participant consent form: Urdu version

UNIVERSITY of York

The Department of Health Sciences

شرکت کنندہ کی رضامندگی کا فارم

براہ کرم ذیل کے خانوں میں نک (✓) کا نشان لگا کر ہر بیان سے اتفاق کی تصدیق کریں۔		
	۱	میں نے شرکاء کی معلوماتی خط پڑھ اور سمجھ لی ہے [تاریخ 20 اپریل 2022، ورژن 1.1]
	۲	مجھے سوالات پوچھنے اور اس مطالعہ پر بحث کرنے کا موقع ملا ہے۔
	۳	مجھے اپنے تمام سوالات کے تسلی بخش جوابات مل چکے ہیں۔
	۴	مجھے مطالعہ کے بارے میں کافی معلومات ملی ہیں۔
	۵	میں سمجھتا ہوں کہ مطالعہ میں میری شرکت رضاکارانہ ہے اور میں مطالعہ سے دستبردار ہونے کے لیے آزاد ہوں: ا۔ کسی بھی وقت ب۔ دستبردار ہونے کی وجہ بتائے بغیر ت۔ اگر میں دستبردار ہوتا/ ہوتی ہوں، جب تک میں اعتراض نہ کروں، محققین مجھ سے جمع کی گئی معلومات کو اس وقت تک استعمال کر سکتے ہیں جب تک میں حصہ لینا بند کر دوں۔
	۶	میں سمجھتا/ سمجھتی ہوں کہ میں جو بھی معلومات فراہم کرتا/ کرتی ہوں، بشمول ذاتی ڈیٹا، کو خفیہ اور محفوظ طریقے سے رکھا جائے گا اور صرف مطالعہ کرنے والے افراد ہی اس تک رسائی حاصل کر سکتے ہیں۔
	۷	میں سمجھتا/ سمجھتی ہوں کہ میں جو بھی معلومات دیتا/ دیتی ہوں اسے شائع شدہ دستاویزات میں شامل کیا جاسکتا ہے لیکن تمام معلومات کو گمنام رکھا جائے گا۔
	۸	میں اس مطالعہ میں حصہ لینے کے لیے راضی ہوں۔

		۹ ان سوالات کے علاوہ براہ کرم تصدیق کریں کہ آیا آپ درج ذیل بیانات سے اتفاق کرتے ہیں۔ اس تحقیقی مطالعہ میں آپ کی
نہیں	ہاں	شرکت متاثر نہیں ہوگی اگر آپ اس بیان سے متفق نہیں ہیں: کیا آپ انٹرویو کے آڈیو ریکارڈ ہونے سے خوش ہیں؟
شرکت کنندہ کے دستخط: تاریخ		
شرکت کنندہ کا نام:		
محقق کا نام اور دستخط: تاریخ		

تاریخ 20 اپریل 2022، ورژن 1.1

Appendix 4: Topic/interview guides

English versions

General instructions

- The questions are a guide to facilitate the interview/discussion; there are prompts to help in asking to questions/ get more information. If answers cover more than one question, no need to ask the additional questions.
- The interviewee has the right to not answer any questions and stop the interview at any time.
- Reassure the interviewee that there are no right or wrong answers, we are really interested in their experiences and views.
- Before starting the interview, turn on recorder.

Before proceeding with the interview please ensure

- The interviewee understands all the information on the information sheet.
- Complete and sign consent form (2 copies, one for researcher and one for participant).
- The interviewee and interviewer are comfortable and are in a private space.

Interview guide for people with diabetes and depression (patient-participants)

Section 1: Current practices for treating depression in type 2 diabetes mellitus

We understand that you have been diagnosed with diabetes. We want to know about your experiences with mental health issues and diabetes.

1. Can you tell me about your mental health and overall well-being?
2. What are the main indicators/symptoms that you may feel when you are depressed? [prompts: mood, feelings, behaviour, physical effects]
3. How does depression impact your life? [prompts: everyday activities, family, relationships]
4. Do you think there is a relationship between diabetes and depression? If YES, why/how are they related?
5. Do you get support from family and friends for your mental health issues? How do they support you? If not, why not?
6. Is there anything that prevents you from seeking help for your depression? [prompts: finance, stigma, logistics]
7. If YES to question 6, is there anything that would encourage you to seek support for mental health issues?

Section 2: Behavioural Activation/talking therapy for treating depression in type 2 diabetes mellitus

I am now going to ask some questions about psychological or talking treatments.

1. Do you think that talking about depression with a friend or a professional can help in improving your mental health? How?
2. Are you aware of 'talking therapies' such as psychotherapy/counselling to manage depression? If YES, what are they and do you think they may be helpful? Why or why not?
3. [If YES to question 2] Have you had any personal experience of talking therapies? If YES, what and delivered by who? Was it helpful? Why or why not? [prompts: details of experience – type of therapy, number of sessions, delivered by who]

I am now going to tell you about Behavioural Activation and then I will ask you some questions about it. [Explanation of Behavioural Activation]

4. Does this explanation of Behavioural Activation make sense to you? What do you think Behavioural Activation is about?
5. Do you think that your behaviour may have changed due to depression? In what way? [prompt: has anyone told you that your behaviour has changed?]
6. Would you be interested in taking part of Behavioural Activation sessions for the management of depression? Why/Why not?
7. What difficulties or challenges may there be in attending Behavioural Activation sessions? How could they be addressed? [prompts: ask about space, time, staff availability]
8. What advantages or benefits could there be of attending Behavioural Activation sessions?

Section 3: Physical activity for treating depression in type 2 diabetes mellitus

I am now going to ask some questions about physical activity.

1. Do you think that changes to your lifestyle can have effect on your mood? Why or why not? [prompts; physical activity, diet]
2. Do you think that physical activity/exercise can help you in improving your mental health and diabetes? Why or why not?
3. Have your family and friends encouraged you to be physically active? If yes, how they encouraged you?
4. Has anyone in health care facility (from which you are taking treatment) advised you to perform physical activity? [prompts: who, type of guidance (verbal, written)]
5. What advantages or benefits could there be to perform physical activity?
6. What difficulties or challenges you might experience when performing physical activity?
7. What would encourage you to take part in physical activity? [prompts: verbal guidance from family member/friend/healthcare worker, written prescription from healthcare worker]
8. Do you think that physical activity type and duration can affect adherence to physical activity? Why/how?

9. Do you think that individualized physical activity protocol according to your needs, preferences and available resources would help you to adhere to physical activity?

[Explain combining Behavioural Activation/talking therapy with physical activity]

10. Do you think that is it possible to combine Behavioural Activation with physical activity? Why/how?
11. What advantages or benefits could there be to combine Behavioural Activation with physical activity?
12. What difficulties or challenges could there be to combine Behavioural Activation with physical activity?

Interview guide for carers

Section 1: Current practices for treating depression in type 2 diabetes mellitus

We understand that you provide care to a friend or family member with diagnosis of diabetes and depression. We want to know about your experiences.

1. How did you come to know that the person, you are caring for has depression?
[prompts: health worker diagnosis, any symptoms/signs]
2. How does depression affect the personality of the person you are caring for?
[prompts: mood, feelings, behaviour, physical effects]
3. How does depression impact life of the person you are caring for?
[prompts: everyday activities, family, relationships]
4. Do you think there is a relationship between diabetes and depression? If YES, why/how are they related?
5. Is there anything that prevents the person you are caring for from seeking help for depression and/or diabetes? [prompts: finance, stigma, logistics]
6. If YES to question 5, is there anything that can encourage the person you are caring to seek support for mental health issues?

Section 2: Behavioural Activation//talking therapy for treating depression in in type 2 diabetes mellitus

1. Are you aware of 'talking therapies' such as psychotherapy/counselling to manage depression? If YES, what are they and do you think talking therapies can be helpful to manage depression? Why or why not?
2. [if YES to question 1] Has the person you are caring for received talking therapies? If YES, what and delivered by who? Was it helpful? Why or why not?
[prompts: details of experience – type of therapy, number of sessions, delivered by who]

I am now going to tell you about Behavioural Activation and then I will ask you some questions about it.

[Explanation of Behavioural Activation]

3. Does this explanation of Behavioural Activation make sense to you? What do you think Behavioural Activation is about?

4. Do you think that the behaviour of the person you are caring for may have changed due to depression? In what way?
5. Would you recommend taking part in Behavioural Activation sessions to the person you are caring for? Why/why not?
6. What difficulties or challenges might there be in attending Behavioural Activation sessions? How could they be addressed? [prompts: ask about space, time, staff availability]
7. For the person you are caring for, what advantages or benefits could there be from attending Behavioural Activation sessions?

Section 3: Physical activity for treating depression in type 2 diabetes mellitus

1. Do you think that changes to lifestyle can have effect on mood of the person you are caring for? Why or why not? [prompts; physical activity, diet]
2. Do you think that physical activity/exercise can help in improving mental health and diabetes of the person you are caring for? Why or why not?
3. Do you encourage the person you are caring for to engage in physical activity? If yes, how you encourage?
4. For the person you are caring for, what advantages or benefits can there be to performing physical activity?
5. For the person you are caring for, what difficulties or challenges can there be to performing physical activity?
6. Do you think that the person you are caring for will adhere to physical activity, if his/her healthcare professional tells him/her to perform physical activity? Why/why not?
7. Do you think that physical activity type and duration can affect adherence to physical activity? How/why?
8. Do you think that individualized physical activity protocol according to person needs, preferences and available resources can affect adherence to physical activity? How/why?

[Explain combining Behavioural Activation/talking therapy with physical activity]

9. Do you think that it is possible to combine Behavioural Activation with physical activity? How/ why?

10. What advantages or benefits could there be to combine Behavioural Activation with physical activity?
11. What difficulties or challenges could there be to combine Behavioural Activation with physical activity?

Interview guide for healthcare workers

Section 1: Current practices for treating depression in type 2 diabetes mellitus

We understand that you are a healthcare staff who provides care to patients with diagnosis of diabetes and depression.

1. How often do you see patients that may be depressed? [prompts: rough numbers/percentages of patients with depression]
2. Do you think there is a relationship between diabetes and depression? If YES, what and why?
3. What do you do when you think a patient may be depressed? Do you follow any protocol or checklist?
4. How important do you think it is that patients with diabetes and depression receive support for their mental health? Why?
5. If a patient is depressed, is any help/support offered at the facility you are working? If YES, please give the details of the support. If NO, why not? [prompts: medication, advice etc.; ask for details e.g., what type of medicine, advice etc]

Section 2: Behavioural Activation//talking therapy for treating depression in type 2 diabetes mellitus

1. Are you aware of talking therapies such as psychotherapy such as cognitive behavioural therapy? If YES, what therapies are you aware of?
2. [If YES to question 1] Do you think talking therapies could be helpful for patients with diabetes and depression? Why or why not?
3. Have you ever heard of a therapy called Behavioural Activation? If yes, what do you think Behavioural Activation is about?

[Explanation of Behavioural Activation]

4. Do you think Behavioural Activation can help a patient with diagnosis of diabetes and depression? Why or why not?
5. With the patients you see do you think helping them to engage in activities could affect their mood? Why or why not? [prompt: How do you think it could be helpful?]
6. What can be the benefits or advantages of Behavioural Activation? [prompts; patient, health care facility, community, health care system]

7. What challenges and barriers may there be to implement Behavioural Activation?
And how could they be overcome/what extra support could be given to overcome these challenges?

Section 3: Physical activity for treating depression in type 2 diabetes mellitus

1. Do you advise lifestyle modification to patients with depression and diabetes? Why or why not? [prompts; physical activity, diet]
2. Do you think that physical activity/exercise can help in improving mental health? Why or why not?
3. Do you encourage your patients to be physically active? If yes, how do you encourage your patients? [prompts: type of guidance (verbal, written)]
4. What advantages or benefits could there be to advising/guiding patients about physical activity?
5. What difficulties or challenges could there be to advising/guiding patients about physical activity?
6. Do you have thoughts on the type and duration of physical activity that might be beneficial for the patients with diabetes and depression?
7. Do you think that patients will adhere to physical activity, if you advise/guide them about physical activity protocol? Why/why not?
8. Do you think that physical activity type and duration can affect adherence to physical activity? How/why?
9. Do you think that individualized physical activity protocol according to patient's needs, preferences and available resources can affect adherence to physical activity?

[Explain combining Behavioural Activation/talking therapy with physical activity]

10. Do you think that it is possible to combine Behavioural Activation with physical activity? How?
11. What advantages or benefits could there be to combine Behavioural Activation with physical activity?
12. What difficulties or challenges could there be to combine Behavioural Activation with physical activity?

انٹرویو گائیڈ

عمومی ہدایات

- اس انٹرویو گائیڈ میں موجود سوالات کا مقصد انٹرویو میں معاونت اور رہنمائی فراہم کرنا ہے۔ سوالات پوچھنے اور مزید معلومات حاصل کرنے کے لیے اس انٹرویو گائیڈ میں اشارے دیے گئے ہیں۔ اگر ایک سوال کے جواب میں شرکت کنندہ ایک سے زیادہ سوالات کے جوابات دیتا ہیں، تو اضافی سوالات پوچھنے کی ضرورت نہیں ہے۔
- انٹرویو لینے والے کو کسی بھی سوال کا جواب نہ دینے اور کسی بھی وقت انٹرویو کو روکنے کا حق حاصل ہے۔
- انٹرویو دینے والا شرکت کنندہ کو یقین دلائیں کہ کوئی جواب صحیح یا غلط نہیں ہے، ہم صرف شرکت کنندہ کے ذہنیات اور ڈپریشن کے علاج کے بارے میں تجربات اور خیالات میں دلچسپی رکھتے ہیں۔
- انٹرویو شروع کرنے سے پہلے، ریکارڈ سٹارٹ کر دیں۔

انٹرویو شروع کرنے سے پہلے براہ کرم یقینی بنائیں کہ:

- ۱۔ انٹرویو دینے والا شرکت کنندہ معلوماتی خط پر موجود تمام معلومات کو سمجھتا ہے۔
- ۲۔ انٹرویو دینے والا شرکت کنندہ نے رضامندی فارم مکمل کر لیا ہے اور اس پر دستخط بھی کر لیا ہے (2 کاپیاں، ایک محقق کے لیے اور ایک شرکت کنندہ کے لیے)۔
- ۳۔ انٹرویو دینے والا شرکت کنندہ اور انٹرویو لینے والا محقق آرام دہ جگہ میں ہے، جہاں پر رازداری کے ساتھ انٹرویو لیا جا سکتا ہے۔

ذیابیطس اور ڈپریشن کے مریضوں کے لیے انٹرویو گائیڈ

- حصہ اول: ذیابیطس اور ڈپریشن کے علاج کے لیے استعمال ہونے والے موجودہ طریقے
- ہم سمجھتے ہیں کہ آپ کو ذیابیطس کی تشخیص ہوئی ہے۔ ہم دماغی صحت کے مسائل اور ذیابیطس کے بارے میں آپ کے تجربات کے بارے میں جاننا چاہتے ہیں۔
- 1- کیا آپ مجھے اپنی ذہنی صحت اور جسمانی صحت کے بارے میں بتا سکتے ہیں؟
 - 2- وہ کون سے اہم علامات ہیں جو آپ محسوس کرتے ہیں جب آپ افسردہ ہوتے ہیں؟
[اشارے: مزاج، احساسات، ہنساؤ، جسمانی اثرات]
 - 3- ڈپریشن نے آپ کی زندگی کو کیسے متاثر کیا ہے؟
[اشارے: روزمرہ کی سرگرمیاں، خاندان، تعلقات]
 - 4- کیا آپ کو لگتا ہے کہ ذیابیطس اور ڈپریشن کے درمیان کوئی تعلق ہے؟ اگر ہاں، تو کیوں/کیسے؟
 - 5- کیا آپ کو اپنے دماغی صحت کے مسائل کے بارے میں خاندان اور دوستوں سے مدد ملتی ہے؟
اگر ہاں، تو آپ کو کس قسم کی مدد ملتی ہے اور کس سے؟ اگر نہیں تو کیوں نہیں؟
 - 6- کیا کوئی ایسی چیز ہے جو آپ کو اپنے ڈپریشن کے لیے مدد لینے سے روکتی ہے؟
[اشارے: مالی مشکلات، معاشرتی رکاوٹیں]
 - 7- اگر سوال 6 کا جواب ہاں میں ہے، تو کیا ایسی کوئی چیز ہے جو آپ کو دماغی صحت کے مسائل کے لیے مدد حاصل کرنے کی ترغیب دے سکتی ہیں؟

حصہ دوم: ذیابیطس اور ڈپریشن کے علاج میں نفسیاتی علاج "بہیورل ایکٹیویشن" کا استعمال

- میں اب نفسیاتی یا بات کرنے والے علاج کے بارے میں کچھ سوالات کرنے جا رہا ہوں۔
- 1- کیا آپ کو لگتا ہے کہ کسی دوست یا دماغی صحت کے ماہر سے ڈپریشن کے بارے میں بات کرنے سے آپ کی ذہنی صحت کو بہتر بنانے میں مدد مل سکتی ہے؟
کیسے؟
 - 2- کیا آپ ڈپریشن کے علاج کے لیے استعمال ہونے والے نفسیاتی علاج سے واقف ہیں؟ اگر ہاں، تو وہ کیا ہیں اور کیا آپ کو لگتا ہے کہ وہ آپ کی ذہنی صحت کو بہتر بنانے میں مددگار ہو سکتے ہیں؟ کیوں/کیوں نہیں؟
 - 3- اگر سوال ۲ کا جواب ہاں میں ہے تو کیا آپ کو نفسیاتی طریقہ علاج کا کوئی ذاتی تجربہ ہے؟ اگر ہاں، تو کیا یہ مددگار تھا؟ کیوں/کیوں نہیں؟
[اشارے: نفسیاتی طریقہ علاج کی تفصیلات، سیشنز کی تعداد، کس کے ذریعے فراہم کی گئی]
 - اب میں آپ کو نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کے بارے میں بتانے جا رہا ہوں اور پھر میں آپ سے اس کے بارے میں کچھ سوالات پوچھوں گا۔
[نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کی وضاحت]
 - 4- کیا نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کی یہ وضاحت آپ کے لیے معنی خیز ہے؟ آپ کے خیال میں "بہیورل ایکٹیویشن" کیا ہے؟
 - 5- کیا آپ کو لگتا ہے کہ آپ کا رویہ ڈپریشن کی وجہ سے بدل گیا ہے؟ کس طریقے سے؟
[اشارہ: کیا آپ کو کسی نے بتایا ہے کہ آپ کا رویہ بدل گیا ہے؟]
 - 6- کیا آپ ڈپریشن کے علاج کے لیے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" میں حصہ لینے میں دلچسپی رکھتے ہیں؟ کیوں/کیوں نہیں؟
 - 7- نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" میں شرکت کرنے میں کیا مشکلات یا چیلنجز ہو سکتے ہیں؟ ان کا ازالہ کیسے ہو سکتا ہے؟
[اشارے: جگہ، وقت، عملے کی دستیابی کے بارے میں پوچھیں]

8- نفسیاتی طریقہ علاج "ہیپورل ایکٹیویشن" میں شرکت کے کیا فوائد ہو سکتے ہیں؟

حصہ سوم: ذیابیطس اور ڈپریشن کے علاج میں جسمانی ورزشوں کا استعمال

میں اب ذیابیطس اور ڈپریشن کے علاج میں جسمانی ورزشوں کا استعمال کے بارے میں کچھ سوالات پوچھنے جا رہا ہوں۔

1- کیا آپ کو لگتا ہے کہ طرز زندگی میں تبدیلی آپ کے مزاج پر اثر انداز ہو سکتی ہے؟ کیوں یا کیوں نہیں؟

[اشارے: جسمانی سرگرمی، خوراک]

2- کیا آپ کو لگتا ہے کہ جسمانی ورزشیں آپ کی دماغی صحت اور ذیابیطس کو بہتر بنانے میں آپ کی مدد کر سکتی ہے؟ کیوں یا کیوں نہیں؟

3- کیا آپ کے خاندان اور دوستوں نے آپ کو جسمانی طور پر متحرک رہنے کی ترغیب دی ہے؟ اگر ہاں، تو کیسے ترغیب دی ہے؟

4- کیا صحت کے عملے میں کبھی کسی نے آپ کو جسمانی ورزشیں کرنے کا مشورہ دیا ہے؟

[اشارے: کون، رہنمائی کی قسم (زبانی، تحریری)]

5- جسمانی ورزشوں کو انجام دینے کے کیا فوائد ہو سکتے ہیں؟

6- جسمانی ورزشوں کو انجام دینے میں آپ کو کون کون سے مشکلات آتے ہیں؟

7- کیا چیز آپ کو جسمانی سرگرمیوں ورزشوں میں حصہ لینے کی ترغیب دے سکتی ہیں؟

[اشارے: خاندان کے افراد / دوست / صحت کے عملے کی زبانی رہنمائی، صحت کے عملے کی طرف سے لکھا ہوا نسخہ]

8- کیا آپ کو لگتا ہے کہ جسمانی ورزش کی قسم اور دورانیہ جسمانی ورزشوں کو باقاعدگی سے کرنے کو متاثر کر سکتا ہے؟ کیوں / کیسے۔

9 - کیا آپ کو لگتا ہے کہ آپ کی ضروریات، ترجیحات اور دستیاب وسائل کے مطابق انفرادی جسمانی ورزشوں کا شیڈول، جسمانی ورزشوں کو باقاعدگی سے کرنے میں

آپ کی مدد کر سکتا ہے؟

[ذیابیطس اور ڈپریشن سے نمٹنے کے لیے نفسیاتی علاج "ہیپورل ایکٹیویشن" اور جسمانی ورزشوں کو یکجا کر کے ایک نیا طریقہ علاج تیار کرنے کی وضاحت]

10- کیا آپ کو لگتا ہے کہ نفسیاتی علاج "ہیپورل ایکٹیویشن" اور جسمانی ورزشوں کو یکجا کرنا ممکن ہے؟ کیوں / کیسے۔

11- جسمانی ورزشوں کے ساتھ نفسیاتی علاج "ہیپورل ایکٹیویشن" کو یکجا کرنے کے کیا فوائد ہو سکتے ہیں؟

12- جسمانی ورزشوں کے ساتھ نفسیاتی علاج "ہیپورل ایکٹیویشن" کو یکجا کرنے میں کیا مشکلات یا چیلنجز ہو سکتے ہیں؟

مریضوں کے دیکھ بھال کرنے والوں کے لیے انٹرویو گائیڈ

- حصہ اول: ذیابیطس اور ڈپریشن کے علاج کے لیے استعمال ہونے والے موجودہ طریقے
- ہم سمجھتے ہیں کہ آپ ایک ایسے شخص کی دیکھ بھال کر رہے ہیں، جو ذیابیطس اور ڈپریشن کا شکار ہے۔ ہم آپ کے تجربات کے بارے میں جاننا چاہتے ہیں۔
- 1- آپ کو کیسے پتہ چلا کہ آپ جس شخص کی دیکھ بھال کر رہے ہیں، وہ ڈپریشن کا شکار ہے؟
[اشارے: تشخیص، رویہ میں تبدیلی، ڈپریشن کے علامات]
 - 2- ڈپریشن اس شخص کی شخصیت کو کیسے متاثر کر رہا ہے، جس کی آپ دیکھ بھال کر رہے ہیں؟
[اشارے: مزاج، احساسات، ہتات، جسمانی اثرات]
 - 3- ڈپریشن اس شخص کی زندگی پر کیسے اثر انداز ہو رہا ہے، جس کی آپ دیکھ بھال کر رہے ہیں؟
[اشارے: روزمرہ کی سرگرمیاں، خاندان، تعلقات]
 - 4- کیا آپ کو لگتا ہے کہ ذیابیطس اور ڈپریشن کے درمیان کوئی تعلق ہے؟ اگر ہاں، تو کیوں/کیسے؟
 - 5- آپ کے خیال میں وہ کون سے عوامل ہیں جو ڈپریشن کے مریض کو نفسیاتی علاج لینے سے روک سکتی ہے؟
[اشارے: مالی مشکلات، معاشرتی رکاوٹیں]
 - 6- آپ کے خیال میں وہ کون سے عوامل ہیں جو ڈپریشن کے مریض کو دماغی صحت کے مسائل کے لیے مدد حاصل کرنے کی ترغیب دے سکتے ہیں؟

حصہ دوم: ذیابیطس اور ڈپریشن کے علاج میں نفسیاتی علاج "بہیورل ایکٹیویشن" کا استعمال

- 1- کیا آپ ڈپریشن کے علاج کے لیے استعمال ہونے والے نفسیاتی علاج سے واقف ہیں؟ اگر ہاں، تو وہ کیا ہیں اور کیا آپ کو لگتا ہے کہ وہ ڈپریشن کے مریض کی ذہنی صحت کو بہتر بنانے میں مددگار ہو سکتے ہیں؟ کیوں/کیوں نہیں؟
- 2- اگر سوال کا جواب ہاں میں ہے تو کیا آپ جس شخص کی دیکھ بھال کر رہے ہیں، اس نے کبھی نفسیاتی طریقہ علاج استعمال کیا ہے؟ اگر ہاں، تو کیا یہ مددگار تھا؟ کیوں/کیوں نہیں؟
[اشارے: نفسیاتی طریقہ علاج کی تفصیلات، سیشنز کی تعداد، کس کے ذریعے فراہم کی گئی]
- اب میں آپ کو نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کے بارے میں بتانے جا رہا ہوں اور پھر میں آپ سے اس کے بارے میں کچھ سوالات پوچھوں گا۔
[نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کی وضاحت]
- 3- کیا نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کی یہ وضاحت آپ کے لیے معنی خیز ہے؟ آپ کے خیال میں "بہیورل ایکٹیویشن" کیا ہے؟
- 4- کیا آپ کو لگتا ہے کہ آپ جس شخص کی دیکھ بھال کر رہے ہیں، اس کا رویہ ڈپریشن کی وجہ سے بدل گیا ہے؟ کس طریقے سے؟
- 5- کیا آپ جس شخص کی دیکھ بھال کر رہے ہیں، اس کو مشورہ دیں گے کہ نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" میں حصہ لیں؟ کیوں/کیوں نہیں؟
- 6- نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" میں شرکت کرنے میں کیا مشکلات یا چیلنجز ہو سکتی ہیں؟ ان کا ازالہ کیسے ہو سکتا ہے؟
[اشارے: جگہ، وقت، عملے کی دستیابی کے بارے میں پوچھیں]
- 7- آپ جس شخص کی دیکھ بھال کر رہے ہیں، اس کے لیے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" میں شرکت کے کیا فوائد ہو سکتے ہیں؟

حصہ سوم: ذیابیطس اور ڈپریشن کے علاج میں جسمانی ورزشوں کا استعمال

1- کیا آپ کو لگتا ہے کہ طرز زندگی میں تبدیلی اس شخص کے مزاج پر اثر انداز ہو سکتی ہے، جس کی دیکھ بھال کر رہے ہیں؟ کیوں/کیوں نہیں؟

[اشارے: جسمانی ورزشیں، خوراک]

2- کیا آپ کو لگتا ہے کہ جسمانی ورزشیں اس شخص کی دماغی صحت اور ذیابیطس کو بہتر بنانے میں مدد کر سکتی ہے، جس کی آپ دیکھ بھال کر رہے ہیں؟ کیوں/کیوں نہیں؟

3- کیا آپ اس شخص کو، جس کی آپ دیکھ بھال کر رہے ہیں، جسمانی طور پر متحرک رہنے کی ترغیب دیتے ہیں؟ اگر ہاں، تو کیسے ترغیب دیتے ہیں؟

4- آپ جس شخص کی دیکھ بھال کر رہے ہیں، اس کے لیے جسمانی ورزشیں کرنے کے کیا فوائد ہو سکتے ہیں؟

5- آپ جس شخص کی دیکھ بھال کر رہے ہیں، اس کے لیے جسمانی ورزشوں کو انجام دینے میں کیا مشکلات یا چیلنجز ہو سکتے ہیں؟

6- کیا آپ کو لگتا ہے کہ آپ جس شخص کی دیکھ بھال کر رہے ہیں وہ باقاعدگی سے جسمانی ورزشیں کریں گے، اگر صحت کا عملہ ان کو جسمانی ورزشیں کرنے کو کہے؟ کیوں/کیوں نہیں؟

7- کیا آپ کو لگتا ہے کہ جسمانی ورزش کی قسم اور دورانیہ جسمانی ورزشوں کو باقاعدگی سے کرنے کو متاثر کر سکتا ہے؟ کیوں/کیسے؟

8- کیا آپ کو لگتا ہے کہ آپ جس شخص کی دیکھ بھال کر رہے ہیں، اس کی ضروریات، ترجیحات اور دستیاب وسائل کے مطابق انفرادی جسمانی ورزشوں کا شیڈول، جسمانی ورزشوں کو باقاعدگی سے کرنے کو متاثر کر سکتا ہے؟

[ذیابیطس اور ڈپریشن سے نمٹنے کے لیے نفسیاتی علاج "بہیورل ایکٹیویشن" اور جسمانی ورزشوں کو یکجا کر کے ایک نیا طریقہ علاج تیار کرنے کی وضاحت]

9- کیا آپ کو لگتا ہے کہ نفسیاتی علاج "بہیورل ایکٹیویشن" اور جسمانی ورزشوں کو یکجا کرنا ممکن ہے؟ کیوں/کیسے؟

10- جسمانی ورزشوں کے ساتھ نفسیاتی علاج "بہیورل ایکٹیویشن" کو یکجا کرنے کے کیا فوائد ہو سکتے ہیں؟

11- جسمانی ورزشوں کے ساتھ نفسیاتی علاج "بہیورل ایکٹیویشن" کو یکجا کرنے میں کیا مشکلات یا چیلنجز ہو سکتے ہیں؟

صحت کے عملے کے لیے انٹرویو گائیڈ

حصہ اول: ذیابیطس اور ڈپریشن کے علاج کے لیے استعمال ہونے والے موجودہ طریقے ہم سمجھتے ہیں کہ آپ صحت کے شعبہ کے ساتھ منسلک ہیں اور ذیابیطس اور ڈپریشن کی تشخیص والے مریضوں کے علاج معالجہ کی سہولیات فراہم کرتے ہیں۔

1- آپ اپنے روزمرہ کی پریکٹس میں عام طور کتنے ڈپریشن کے مریض دیکھتے ہیں؟

[اشارے: ڈپریشن کے مریضوں کی تعداد/ فیصدی]

2- کیا آپ کو لگتا ہے کہ ذیابیطس اور ڈپریشن کے درمیان کوئی تعلق ہے؟ اگر ہاں، تو کیوں/کیسے؟

3- جب آپ کو لگتا ہے کہ کوئی مریض ڈپریشن کا شکار ہے، تو آپ کیا کرتے ہیں؟ کیا آپ کسی خاص پروٹوکول کی پیروی کرتے ہیں؟

4- آپ کے خیال میں یہ کتنا ضروری ہے کہ ذیابیطس کے مریضوں کو ذہنی صحت کے مسائل کے علاج معالجہ کے بارے میں آگاہی ہو؟ کیوں؟

5- اگر کوئی مریض ڈپریشن کا شکار ہو، تو آپ کس طرح اس مریض کی مدد کرتے ہیں، براہ کرم مدد کی تفصیلات دیں۔ اگر نہیں، کیوں نہیں؟

[اشارہ: دوا، مشورہ وغیرہ؛ تفصیلات طلب کریں جیسے کہ کس قسم کی دوا، مشورہ وغیرہ]

حصہ دوم: ذیابیطس اور ڈپریشن کے علاج میں نفسیاتی علاج "بہیورل ایکٹیویشن" کا استعمال

1- کیا آپ نفسیاتی علاج سے واقف ہیں اگر ہاں، تو آپ کن نفسیاتی طریقہ علاجوں سے واقف ہیں؟

2- [اگر سوال 1 کا جواب ہاں میں ہے] کیا آپ کو لگتا ہے کہ نفسیاتی علاج ڈپریشن کے شکار ذیابیطس کے مریضوں کے لیے مددگار ثابت ہو سکتے ہیں؟ کیوں یا کیوں نہیں؟

3- کیا آپ نے کبھی نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کے بارے میں سنا ہے؟ اگر ہاں، تو آپ کے خیال میں "بہیورل ایکٹیویشن" کیا چیز ہے؟

اب میں آپ کو نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کے بارے میں بتانے جا رہا ہوں اور پھر میں آپ سے اس کے بارے میں کچھ سوالات پوچھوں گا۔

[نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کی وضاحت]

4- کیا آپ کو لگتا ہے کہ نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" ڈپریشن کے شکار ذیابیطس کے مریضوں کے لیے مددگار ثابت ہو سکتے ہیں؟ کیوں یا کیوں نہیں؟

5- جن مریضوں کو آپ دیکھتے ہیں کیا آپ کے خیال میں سرگرمیوں میں مشغول ہونے میں ان کی مدد کرنا ان کے مزاج کو متاثر کر سکتا ہے؟ کیوں یا کیوں نہیں؟

[اشارہ: آپ کے خیال میں یہ کیسے مددگار ہو سکتا ہے؟]

6- آپ کے خیال میں نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" میں شرکت کے مریضوں کے لیے کیا فوائد ہو سکتے ہیں؟

7- نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کو فعال کرنے میں کیا چیلنجز اور رکاوٹیں ہو سکتی ہیں؟ اور ان پر کیسے قابو پایا جا سکتا ہے/ان چیلنجز پر قابو پانے کے لیے کیا اضافی مدد دی جا سکتی ہے؟

حصہ سوم: ذیابیطس اور ڈپریشن کے علاج میں جسمانی ورزشوں کا استعمال

1- کیا آپ ڈپریشن اور ذیابیطس کے مریضوں کو طرز زندگی میں تبدیلی کا مشورہ دیتے ہیں؟ کیوں یا کیوں نہیں؟

[اشارے: جسمانی ورزشیں، خوراک]

2- کیا آپ کو لگتا ہے کہ جسمانی ورزش دماغی صحت کو بہتر بنانے میں مدد کر سکتی ہے؟ کیوں یا کیوں نہیں؟

3- کیا آپ اپنے مریضوں کو جسمانی طور پر متحرک رہنے کی ترغیب دیتے ہیں؟ اگر ہاں، تو کیسے ترغیب دیتے ہیں؟

[اشارہ: رہنمائی کی قسم (زبانی، تحریری)]

- 4- جسمانی ورزشوں کے بارے میں مریضوں کو مشورہ دینے/رہنمائی کرنے کے کیا فوائد یا ہو سکتے ہیں؟
- 5- جسمانی ورزشوں کے بارے میں مریضوں کو مشورہ دینے/رہنمائی کرنے میں کیا مشکلات یا چیلنجز ہو سکتے ہیں؟
- 6- کیا آپ کو جسمانی ورزشوں کی قسم اور دورانیہ کے بارے میں کوئی اندازہ ہے، جو ذیابیطس اور ڈپریشن کے مریضوں کے لیے فائدہ مند ہو سکتا ہے؟
- 7- کیا آپ کو لگتا ہے کہ مریض جسمانی ورزشیں کریں گے، اگر آپ انہیں جسمانی ورزشوں کے بارے میں مشورہ/رہنمائی دیتے ہیں؟ کیوں یا کیوں نہیں؟
- 8- کیا آپ کو لگتا ہے کہ جسمانی ورزشوں کی قسم اور دورانیہ جسمانی ورزشوں کو باقاعدگی سے کرنے کو متاثر کر سکتا ہے؟
- 9- کیا آپ سمجھتے ہیں کہ مریض کی ضروریات، ترجیحات اور دستیاب وسائل کے مطابق انفرادی جسمانی سرگرمی کا پروٹوکول جسمانی سرگرمی کی پابندی کو متاثر کر سکتا ہے؟

-[ذیابیطس اور ڈپریشن سے نمٹنے کے لیے نفسیاتی علاج "ہیپورل ایکٹیویشن" اور جسمانی ورزشوں کو یکجا کر کے ایک نیا طریقہ علاج تیار کرنے کی وضاحت]

- 10- کیا آپ کو لگتا ہے کہ نفسیاتی علاج "ہیپورل ایکٹیویشن" اور جسمانی ورزشوں کو یکجا کرنا ممکن ہے؟ کیسے؟
- 11- جسمانی ورزشوں کے ساتھ نفسیاتی علاج "ہیپورل ایکٹیویشن" کو یکجا کرنے کے کیا فوائد ہو سکتے ہیں؟
- 12- جسمانی ورزشوں کے ساتھ نفسیاتی علاج "ہیپورل ایکٹیویشن" کو یکجا کرنے میں کیا مشکلات یا چیلنجز ہو سکتے ہیں؟

Appendix 5: Ethics approval certificates

Health Sciences Research Governance Committee, University of York



DEPARTMENT OF HEALTH SCIENCES

c/o Department of Philosophy
Heslington
York YO10 5DD

Telephone (01904) 323253/1
**Chair, Health Sciences Research
Governance Committee**
www.york.ac.uk/healthsciences

6 May 2022

Mr A Arsh
University of York
Department of Health Sciences
York YO10 5DD

Dear Aatik

HSRGC/2022/498/A: Behavioural activation with physical activity for managing depression in diabetes

Your project was reviewed by the Health Sciences Research Governance Committee on 14 March 2022 and I wrote to you on 29 March with the committee's decision. Thank you for meeting with me on 29 March to discuss the committee's concerns and thank you for yesterday's email including responses to those concerns and a revised submission form.

In light of these revisions I am writing to approve the project by Chair's action.

In addition, please send us a copy of the approval letter from Khyber Medical University Ethics Board when you have it. In the meantime, if you have any queries about this Chair's action, please let me know. Finally, if you intend to submit this letter or any other correspondence from the HSRGC as part of your assessed work (e.g., to demonstrate that your study has ethical approval) please make sure you edit the letter to maintain anonymity.

Yours sincerely

Chair: HSRGC

Ethics board, Khyber Medical University



KHYBER MEDICAL UNIVERSITY

KMU-ETHICS COMMITTEE

PHASE-V, HAYATABAD, KHYBER PAKHTUNKHWA, PESHAWAR, PAKISTAN

☎ 091-9217258,



☎ 091-9217704

No. DIR/KMU-EB/CB/00115

Dated: 23-05-2022

TO WHOM IT MAY CONCERN

Certified that after desk review ethical approval has been granted provisionally to the project title
“Combining behavioral activation with physical activity for the management of depression
among adults with type 2 diabetes mellitus: A qualitative study using interviews and co-
design to inform the development of an intervention” submitted by Dr. Aatik Arsh, PhD
scholar, Institute of Public Health & Social Sciences (IPH&SS), Khyber Medical University,
Peshawar.

Dr. Zohaib Khan,
Secretary KMU-Ethics Committee

Appendix 6: Additional participant quotes from qualitative research study

Theme	Additional participant quotes
Theme 1: Cultural and religious norms and practices influence physical activity behaviours	‘.....this is important to tell you that I go there (for tabligh/ for preaching) for 3 days in month and every day and every week we do gasht (visits other people to invite them towards religion) and I go to shabe juma (Friday night sermon), if I am ill or okay, I try not to skip any of these (activities) and much more than this.....’ [Patient participant, male] ‘.... simply I take her (wife) to my brother house [pause] some half kilometre away from us (from our home), [smile] and I think this walk is enough for her.... we go there (to relative homes) to ask about them (about their health conditions and provide help if needed) if this is an occasion of condolence or of marriage, she will be with me... some week ago, I go there (to village) and we walk there and she was so happy [smile], she tells me to go there again.....’ [Carer, male] ‘.....oh, this is clear [In a bit louder voice], Islam never stop you from doing something for yourself. [pause] [with normal tone] Even it (religion) says that people should be strong (healthy).... just open the Quran and you will see that there are many places where people are guided to prepare yourself [pause] and do activities and take care of your health.... if you are doing it (physical activity) with good intension, it is (considered as) a good deed (according to religious teachings). [pause] If you want to be healthy (if you take care of your health), you will be

	rewarded for that (because taking care of your health is considered as good deed) ...' [Patient participant, male] '..... my husband is always there to help me with my insulin injections, so he can help me in that (to do physical activity) my daughter says to me to go out of home and always willing to go for a walk with me, so they (family) help me to do more and more and remain active.... I know that they (family) are there for me for whatever to good (improve) my mood (mental health) and sugar (diabetes)....' [Patient participant, female] '... the main thing is that when you are with friends, you enjoy it and when walk in group form, it has much deeper effects... I go with childhood friends out and they meet me with many new people...' [Patient participant, male] '.... these patients have links, so when they came here (to clinic) they discuss with each other, what they do and what doctor told them and so on, so if one patient start exercises and he feel its benefits then he will be telling all patients about it....' [Healthcare worker, male] '.... when I see IK (name of a former cricketer/ex-Prime Minister of Pakistan) running in hills at this age, (a bit louder tone) I think I can do this as well...' [Patient participant, male] '..... people help other in community, and it think if they (members of the society/community) that this person can feel good with this (physical activity), they will definitely help, [with smile] even they will supervise him (the patient) whether he is doing it (exercises) or not...' [Healthcare worker, female]

	‘....do you know the condition of my home.... I always suffer due to domestic issues that torn me (have bad effects on my health)... you can say that but it is me to handle the situation, no matter what the case (problem) is... in most of these situations I may not be feeling well as I feel exhausted, (now) in this situation you will still told me to do exercises, it is easy to say but you cannot do it in these (bad) situations (bad household conditions)....’ [Patient participant, female] ‘.... sometime ago, (I observe) people were running on the road and some people standing in market were laughing at them...’ [Healthcare worker, male] ‘...it is bit tragic but, [low tone], we are not in a position to walk here (city/urban area), so how a female living in a remote place (rural area) can come out of home daily.....if it happens, all men will be staring what she is doing....’ [Healthcare worker, female] ‘...in our society, they (women) often feel shy to do it (physical activity) ... you know what, they know that it is not appropriate (to go outside of home for physical activity) despite this doctor tell them do exercise, who will tell them, how to do it’ [Carer, male] ‘.... sometimes I want to do (perform) it (physical activity) and go out (of home) and go to market and [long pause] do what I did before (in the past before the diseases), people say no take rest (as) it (doing physical activity) can worse your condition (diabetes and depression)’ [Patient participant, female] ‘.... (I want to) be clear (regarding it), some (people) say don’t do that (physical activity) and be careful and some

	say walk and do other (activities), [smile] which is better (I am confused about it) ... most people say take rest to rest your mind (reduce depressive symptoms), (I) don't know it is correct (or not)' [Patient participant, male]
Theme 2: Availability of resources and the potential for incorporating physical activity into routine life determines physical activity behaviours	'.... I know I can choose some good work (purposeful activity) and continue it. On Sunday I do many things.... I sometime find it interesting to do some activities that give me happiness (pleasurable activities), this (provide me opportunity to do (physical) activity and (also provide opportunity) to enjoy it as well.... (I) enjoy walking with husband and talking to him or any other (activity) like that....' [Patient participant, female] '.... they (patients) may encounter difficulties to incorporate physical activity into their daily lives....so what I have found that it is helpful if they (patients) do it (physical activity) when doing any enjoyable or (useful) activities....' [Healthcare worker, female] Another participant added: '.....the interesting aspect is that everyone can do physical activity by their own way..... I do exercises in the morning without anyone and I think patients can do it without any supervision..... [Healthcare worker, male] '....so, if (patients) have flexible physical activity schedule, they have more chances to be (physically) active.... why you know, they can choose to be active at times that are easy (and convenient) (for them) and not to tie to a specific time or place....' [Healthcare worker, female] '....it is easy, you can note it in this (pointing towards mobile phone) or in a diary or in workbook, you can check the progress and you can tell them (patients with diabetes

	and depression) how much you did and how much you have to do....' [Healthcare worker, male] '....one of the interesting things about it (physical activity) is that you can grade it.... you know exercises or sports can be competitive which make it more motivating, even it can be competition with your own self, means how much activity you do today or how much will you do tomorrow....' [Healthcare worker, male] '.... (I) can say that they (patients) can choose activities that are appropriate for their (fitness) level and physical limitations....' [Healthcare worker, male] '.... exercise needs (specified) place and other things (equipment's, dressing)' [Patient participant, male] '.... hmmm, so patients here cannot afford the costs related to attending a gym or going to a swimming pool. If they cannot pay for the resources, (I) think it is useless to prescribe (physical activity) to them now a days, gym charges up to 3000 rupees per month, so even I cannot go to gym for exercises, so how I can advise them (patients) for it...' [Healthcare worker, male] '.....they (government) are not responsible for everything, look government provided BRT cycles everywhere [pause], now go there and use it. Is it not helpful to promote physical activity here (in this region) [smile], I say yes because this is first time, we see something is done (by government to promote physical activity)' [Healthcare worker, male] '.... sometimes it (physical activity) looks boring (but) if I go to park and I find some friend there then I am happy (at

	park) and (then) I (stay) there (at park) for long hours...' [Patient participant, female] '....for me anything can be exercise, [pause] let me tell you that (there is) hill in our village, and I go there once in a week, (because) I go to village on every Sunday, [pause] going there (climbing to hill) helps me a lot, [smile] and you know my problems (depressive symptoms) go away (reduce) with that...' [Patient participant, male] '...whenever I visit village, usually I go there in a month [pause], I love to swim the canals there and walk in the fields [smile], you know it isn't possible here (in the city)' [Patient participant, male] '... do you read that (newspaper), everyday there is bad reports (street crimes) related to this area.....how people (can) go outside, if there is fear... and how you can convince a person with disease (diabetes and depression) for going outside in this situation....' [Carer, female] '.... I am afraid of dogs from childhood and here when I came out of home, there are many dogs in the street. [With smile] when they (dogs) see me, they must bark at me, they know they she is afraid from us... and due to these (stray dogs) I don't come out in the evening with my family....' [Patient participant, female] '.... here the summer are long and warm, and it is almost impossible to go outside for physical activity, [smile] when it is so warm outside.... amazing thing is that you cannot go outside in winter (due to cold)' [Healthcare worker, male]
Theme 3: Available healthcare resources	'.... we do it in general practice, but it need to be documented, not sure about other (healthcare

can be used to promote physical activity	professionals) but I talk about it (physical activity) always, (but) simply there is difference in it (verbal discussion) and proper training' [Healthcare worker, female] '.... now even we have physical therapists at secondary level (District Headquarter Hospitals), so is it not sensible that they take the role of physical activity educators....' [Healthcare worker, male] '.... yes, I agree that it is our responsibility to say about exercises to them (patient) because it is part of our duty....' [Healthcare worker, male] '.... (It is) very interesting when (physical activity) is advised by doctor as they (patients) feel that it is part of their treatment. So, we are aware that they (patients) only follow doctors...' [Carer, male] '.... if they (healthcare professionals) guide them about importance of it (physical activity) and tell them why they (patients) should do it and other (lifestyle) activities, they will automatically drift towards it, what I am saying that proper counselling is necessary in this case....' [Carer, male] '... you must check this, how many of us are trained to advise it (physical activity) a general practitioner cannot prescribe a right physical activity to a patient with diabetes, this is a total failure indeed....' [Healthcare worker, female] '.... we all know that they (patients) visit OPD of diabetes doctor for their condition, then why not there is someone who can told them about it (physical activity), they (patients) can be educated about it (physical activity) during their diabetes treatment and even patient can be

	referred to relevant speciality' [Healthcare worker, male] '.... when baji (psychologist) told me that I have to focus on it (physical activity) and that it can help with my mind (mental health), after that I walk every day, I go there (park) with my husband as I know baji will ask from me about it (physical activity) when I will meet her (again for next consultation)' [Patient participant, female] '.... (I think) overlap in work (among healthcare professionals) exists (in healthcare system), so one say he will do that (advise/prescribe physical activity to patient) and second say he will do that [long pause], in the end, none (of the healthcare professionals) tell him (the patients) about it (physical activity)... the problem starts with us as there is communication gap between professionals of different specialities... the referral system is not up to the mark and there are many hurdles in the practice...' [Healthcare worker, female] '..... (you) visit my OPD and see how many patients we have in OPD. We even don't have the time to ask their symptoms, so how do you think we can tell them about exercises which needs a lot of time....' [Healthcare worker, male] '.... we are only 3 (senior healthcare professionals) here (in this department) and we know they (administration) say you are enough and can do all this....' [Healthcare worker, female] '..... I was reading a column (in magazine) [pause], some days before, and it was mentioned that mental problems (mental health issues) have increased too much and that

	Govt. has taken some initiative to consider it at policy level, this is positive thing indeed... why you don't tell them also include these exercises things into policies....' [Carer, male] '.... not in Pakistan but this (prescription of physical activity) is present (practiced) in big (developed) countries... we need to involve them (policymakers) to raise it on upper (policy) level....' [Healthcare worker, female] '.....(I) don't know if we have any policy at any level (national, provincial) about advising physical activity to patients with diabetes and depression, do you not think that we have to focus on it (policies)....' [Healthcare worker, female] '.... yes, yes, they (Govt.) introduced this (Sehat Sahulat Card), but it is only for treatment, and it have nothing for promoting healthy lifestyle (such as physical activity)' [Healthcare worker, female] '.... the concept that exercise is medicine is new here (in Pakistan) [pause] but you know one day you will see to have policy on that to properly prescribe it (physical activity) to patients, but it will take some time....' [Healthcare worker, male]
Theme 4: Patients' individual level characteristics affect their physical activity behaviours	'.... it's simple, if they (patients) are aware of the potential benefits of it (physical activity), they are more likely to be motivated and will be engage in it' [Healthcare worker, male] '.... well, my belly (stomach) is not good (functioning) from [pause] 6 months [pause] and my husband told me that this is because of this (pointing towards medication)

	tell me what I do, if doctor told me that this (physical activity) can do it (manage my diabetes and depression), will surely leave, or reduce the tablets (medications).... we all know that these chemicals (medications) can harm our body....' [Patient participant, female] '.... mean you say, it (routine work) and exercise is same thing, no it is (not).... exercise needs (specified) place and other things (equipment's, dressing)' [Patient participant, male] '.....understanding it (physical activity) is difficult... patients don't know what to do, how often to do it (physical activity), or how to progress...' [Healthcare worker, male] '.....I hate tablets (medications), it can be bad, therefore I always avoid it... (we should always) try to manage diseases with natural things... one year before, I have pain in my back and at that time I didn't take and tablets (medications) and go to a doctor near my home (and)learn some exercises from him and I am fine up to now...' [Patient participant, male] '.... it all depends on them (patients), if they walk it is their benefit, if they have good habits, it will benefit them.... I think behaviour can be changed anyway, if it is positive (behaviour), they will walk more and they will improve...' [Carer, male] '...whenever I walk for 10 to 15 minutes, I experience positive effects on my mood ...' [Patient participant, female] '...so sometime when I am not okay (and) feel like I am down [pause], (I) go (climb) to the hill near my home.... well, I feel very relaxed when I go with my friend and talk

	and go here and there, I cannot say (anything), maybe it is exercising that good (improve) my mind (mental health) ...' [Patient participant, male] '.... I don't want other look (at) me when I do exercise as they will laugh at me and will say look into that old woman and what she is doing...' [Patient participant, female] '.... so, the simplest thing is that severity of existing symptoms of disease (diabetes and depression) is a barrier to it (physical activity) you cannot just educate them (patients) about it until you didn't treat their conditions (diabetes and depression)' [Healthcare worker, male] '.... remember, you have to manage those (physical limitations) first.... okay, you tell me if a person has pain, he says I am not okay with it (exercise), will it be possible to still say to do exercise....' [Healthcare worker, male] '.... (I am) afraid of injuring myself when doing games (sports), even from my childhood.... till now I afraid of getting hurt.... even today, I still sometimes avoid exercise because I fear that I might hurt myself....' [Patient participant, male] '.... literacy is the main challenge here (in Pakistan) ...almost 90% of our patients are illiterate and it is very difficult to explain its (physical activity) benefits to them... (low) education and poverty affects the use of such (lifestyle) intervention in clinical practice in our country.... so, if they (patient) have car, so how you can tell them to walk in routine, yes, it is alright if they don't have, they are compelled to walk, what actually we need to say is one thing is not fit for all...' [Healthcare worker, male]

Theme 5: Technology-based interventions may be used to promote physical activity	‘.... literally, ooh, [long pause], YouTube is my doctor for diet and exercise.... and you know why I am saying it because there are many groups and channels on net (internet) from which I get information related to my condition (diabetes and depression)’ [Patient participant, female] ‘.... you know I follow (name of social medial star) on Facebook and when he posts videos related to exercises and running, then I am also motivated to do exercises....’ [Patient participant, male] ‘...so as far as my thinking is, media use is a way to raise awareness about it (physical activity) you know simple videos in the morning about it on TV can teach people about exercises....’ [Carer, female] ‘....it (media) can help to finish (eradicate) some of the myths and misconceptions about it (mental health/ depression, physical activity)’ [Healthcare worker, male] ‘..... if I tell (of myself), so I do exercise on a treadmill in the morning, for some 30 minutes...’ [Healthcare worker, male] ‘.....how, then if internet is not working then what will be benefit in that case (of technology-based solutions and interventions which need internet connectivity)’ [Carer, male] ‘.....do you think that the video you (are) watching is not noticed (by someone) ...I am too much concerned about my data on the internet (about privacy)’ [Patient participant, male]

	‘..... well, just tell (me) about my experience, once I advise a patient to use mobile to search something to learn about it (exercises), his response (was) shocking [with smile], (the patient) says then why I come here and, you know [pause], I have no answer.... it does not work for all; some have negative time (experience) with communication and relationships with it’ [Healthcare worker, male] ‘...think and think, if I am watching a video and my husband come in and he says what you are doing.... let me tell you that people here (in our culture) think it is bad to watch videos...’ [Patient participant, female]

Appendix 7: Participant information sheets and consent forms of Intervention adaptation study

Participant information sheets: English version



Participant Information Sheet (Patient-Participants)

“Adaptation of a Behavioural Activation intervention to promote physical activity among women with depression and type 2 diabetes mellitus in Pakistan”

We would like to invite you to take part in the above-named study but before you decide, please read the following information.

What is the purpose of this study?

We are conducting a research study to adapt a Behavioural Activation intervention to promote physical activity among women with type 2 diabetes mellitus and depression. Women with diabetes and depression are often physically inactive and Behavioural Activation may be used to motivate them to perform physical activity because Behavioural Activation focuses on routine, necessary and enjoyable activities. Therefore, we want to adapt a Behavioural Activation intervention to promote physical activity among women, for which we need to better understand your views and experiences.

Who is doing the study?

The study will be conducted by Aatik Arsh, who is a PhD student at University of York, United Kingdom. The study is being conducted as part of an educational qualification.

Why have I been asked to participate?

We are conducting this study to explore views, perceptions, and experiences of patients, carers, and healthcare staff about the use of Behavioural Activation to promote physical activity among women with diabetes and depression. You have been identified as someone who has been diagnosed with diabetes and depression, therefore you are being invited to participate in the study.

Do I have to take part?

It is up to you to decide whether to participate or not. The care that you receive won't change if you decide not to participate in the study.

Your participation in the study will be voluntary. After reading the information provided in this information sheet, we will provide you with a consent form. If you agree to participate in the study, we will ask you to complete the consent form and sign it (or put your thumb impression).

How do I sign up to the study?

If you wish to sign up to the study, you can contact the lead researcher, 'Dr. Aatik Arsh' using contact number or email address provided in the contact details at the end of this information sheet. You can also use the 'self-addressed envelope' available with this information sheet to sign up to the study.

What will be involved if I take part in this study?

After signing the consent form, the researcher will share the schedule of two workshops which will be conducted at Khyber Medical University Peshawar. Each workshop will be of approximately 4 hours and will be scheduled on any working day in the month of May and June 2023. The schedule for the workshops will be shared in advance. If it is not possible for you to participate in both workshops, you can participate in either first or second workshop. During the workshop, the facilitator will ask some questions and will guide you to perform some written activities. Most of the activities will be in group format and all the activities will be culturally and religiously appropriate. You will be free to skip any question or activity if- you are not comfortable with it. The workshop will be conducted in Urdu and Pashto. You can ask the facilitators questions if you need clarification regarding any question or activity during workshop. The workshop will be informal and there will be no right or wrong answers.

What are the advantages or benefits of taking part?

You may not have any direct benefits of taking part in the study, however, you will have an opportunity to discuss your healthcare experiences during the workshop. In addition, the information you provide will be used to improve the care of diabetes and depression.

What are the disadvantages or risks of taking part?

It will take time to take part in the study. You will have to travel to the location, where the workshops will be conducted. We will not be able to compensate any costs you incurred in taking part in the study.

You may become distressed whilst discussing your experiences during the workshop. If you feel distressed or are not comfortable with the questions, you can leave the workshop at any time. You can inform the workshop facilitators if you need any support during the workshop.

Can I withdraw from the study at any time?

You are free to withdraw from the study at any time, without giving a reason. You do not have to answer any questions or perform any activity that you are not comfortable with. You can leave the workshop at any time, but already collected data will be used in the study. The care that you receive won't change if you decide to withdraw yourself or your data from the study.

How will the information and personal data I give be handled?

We will treat any information you give us as confidential. We will store all your information safely and securely. We will remove all identifiable information from the collected data. The data collected in hard form will be kept in a locked cupboard at Khyber Medical University Peshawar. Electronic data will be password protected and will be held on a secure computer server at Khyber Medical University Peshawar. The data will be retained for 10 years and then will be destroyed according to University of York policy. Please note that we will maintain confidentiality unless you disclose information that identifies a risk of harm to yourself or others. In that situation we will need to inform the PhD supervisor within the trust, who may contact you to arrange support or onward referral where needed. We would be happy to answer any questions you may have about how we use the information we receive from you as part of the study. Through the following links, you can access to webpages which contain generic information about General Data Protection Regulation and data management

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What will happen to the results of the study?

The results of the study will be published in academic journals and will be presented in research conferences. The results of the study will be disseminated with the community members through short reports which will be shared via social media platforms and local magazines and newspapers. Furthermore, the findings of the study will help to improve the care of diabetes and depression.

Who has reviewed and approved this study?

The University of York's Health Sciences Research Governance Committee United Kingdom and Ethics Board of Khyber Medical University Peshawar Pakistan have reviewed and granted ethical approval to the research project.

Who do I contact to sign up to the study or if I need further information about the study?

You can contact on following email address or contact number, if you want to sign up to the study or need any further information about the research study.

Dr. Aatik Arsh

Email: aa2723@york.ac.uk

Contact Number: +92 344 6997046

Who do I contact in the event of a complaint?

For general complaints, you can contact

Prof. Najma Siddiqi

Email: najma.siddiqi@york.ac.uk

Dr. Saima Afaq

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Thank you for taking the time to read this information sheet.

Participant Information Sheet (Carers)

“Adaptation of a Behavioural Activation intervention to promote physical activity among women with depression and type 2 diabetes mellitus in Pakistan”

We would like to invite you to take part in the above-named study but before you decide, please read the following information.

What is the purpose of this study?

We are conducting a research study to adapt a Behavioural Activation intervention to promote physical activity among women with type 2 diabetes mellitus and depression. Women with diabetes and depression are often physically inactive and Behavioural Activation may be used to motivate them to perform physical activity because Behavioural Activation focuses on routine, necessary and enjoyable activities. Therefore, we want to adapt a Behavioural Activation intervention to promote physical activity among women, for which we need to better understand your views and experiences.

Who is doing the study?

The study will be conducted by Aatik Arsh, who is a PhD student at University of York, United Kingdom. The study is being conducted as part of an educational qualification.

Why have I been asked to participate?

We are conducting this study to explore views, perceptions, and experiences of patients, carers, and healthcare staff about the use of Behavioural Activation to promote physical activity among women with diabetes and depression. You have been identified as someone who provides care to a family member with diagnosis of diabetes and depression, therefore you are being invited to participate in the study.

Do I have to take part?

You do not have to participate in the study. It is up to you to decide whether to participate or not. The care that your family member receive won't change if you decide not to participate in the study.

Your participation in the study will be voluntary. After reading the information provided in this information sheet, we will provide you with a consent form. If you agree to participate in the study, we will ask you to complete the consent form and sign it (or put your thumb impression).

How do I sign up to the study?

If you wish to sign up to the study, you can contact the lead researcher, 'Dr. Aatik Arsh' using contact number or email address provided in the contact details at the end of this information sheet. You can also use the 'self-addressed envelope' available with this information sheet to sign up to the study.

What will be involved if I take part in this study?

After signing the consent form, the researcher will share the schedule of two workshops which will be conducted at Khyber Medical University Peshawar. Each workshop will be of approximately 4 hours and will be scheduled on any working day in the month of May and June 2023. The schedule for the workshops will be shared in advance. If it is not possible for you to participate in both workshops, you can participate in either first or second workshop. During the workshop, the facilitator will ask some questions and will guide you to perform some written activities. Most of the activities will be in group format and all the activities will be culturally and religiously appropriate. You will be free to skip any question or activity if- you are not comfortable with it. The workshop will be conducted in Urdu and Pashto. You can ask the facilitators questions if you need clarification regarding any question or activity during workshop. The workshop will be informal and there will be no right or wrong answers.

What are the advantages or benefits of taking part?

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What are the disadvantages or risks of taking part?

It will take time to take part in the study. You will have to travel to the location, where the workshops will be conducted. We will not be able to compensate any costs you incurred in taking part in the study.

You may become distressed whilst discussing your experiences during the workshop. If you feel distressed or are not comfortable with the questions, you can leave the workshop at any time. You can inform the workshop facilitators if you need any support during the workshop.

Can I withdraw from the study at any time?

You are free to withdraw from the study at any time, without giving a reason. You do not have to answer any questions or perform any activity that you are not comfortable with. You can leave the workshop at any time, but already collected data will be used in the study.

The care that your family member receive, won't change if you decide to withdraw yourself or your data from the study.

How will the information and personal data I give be handled?

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What will happen to the results of the study?

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Participant Information Sheet (Healthcare Staff)

“Adaptation of a Behavioural Activation intervention to promote physical activity among women with depression and type 2 diabetes mellitus in Pakistan”

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Why have I been asked to participate?

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Do I have to take part?

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Thank you for taking the time to read this information sheet.

Participant information sheets: Urdu version

UNIVERSITY of York

The Department of Health Sciences

معلوماتی خط برائے شرکاء (مریض شرکاء)

ہم آپ کو مذکورہ مطالعہ میں حصہ لینے کے لیے مدعو کرنا چاہتے ہیں لیکن اس سے پہلے کہ آپ فیصلہ کریں، براہ کرم درج ذیل معلومات کو پڑھیں۔

اس مطالعہ کا مقصد کیا ہے؟

ہم ایک تحقیقی مطالعہ کر رہے ہیں، جس کا مقصد ذیابیطس اور ڈپریشن میں مبتلا خواتین میں جسمانی سرگرمی کو فروغ دینے کے لئے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کا استعمال ہے۔ ذیابیطس اور ڈپریشن میں مبتلا خواتین اکثر جسمانی طور پر غیر فعال ہوتی ہیں اور انہیں جسمانی سرگرمی کرنے کی ترغیب دینے کے لئے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کا استعمال کیا جاسکتا ہے کیونکہ نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" معمول، ضروری اور خوشگوار سرگرمیوں کو فروغ دینے میں معاونت کرتی ہے۔ لہذا، ہم خواتین میں جسمانی سرگرمی کو فروغ دینے کے لئے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کو استعمال کرنا چاہتے ہیں، جس کے لئے ہمیں آپ کے خیالات اور تجربات کو بہتر طور پر سمجھنے کی ضرورت ہے۔

مطالعہ کون کر رہا ہے؟

یہ تحقیقی مطالعہ عاتک عرش کریں گے، جو یونیورسٹی آف یارک، برطانیہ میں پی ایچ ڈی کے طالب علم ہیں۔ یہ تحقیقی مطالعہ پی ایچ ڈی ڈگری کی تکمیل کے لیے کیے جانے والے تحقیق کا حصہ ہے۔

مجھے شرکت کے لیے کیوں کہا گیا ہے؟

ذیابیطس اور ڈپریشن میں مبتلا خواتین میں جسمانی سرگرمی کو فروغ دینے کے لئے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کے استعمال کے بارے میں مریضوں، ان کے دیکھ بھال کرنے والوں، اور صحت کے عملے کے خیالات، تاثرات اور تجربات کو دریافت کرنے کے لیے، ہم یہ مطالعہ کر رہے ہیں۔ آپ کی شناخت ایک ایسے شخص کے طور پر ہوئی ہے جو ذیابیطس اور ڈپریشن میں مبتلا ہے، اس لیے آپ کو مطالعہ میں شرکت کے لیے مدعو کیا جا رہا ہے۔

کیا اس تحقیقی مطالعہ میں حصہ لینا ضروری ہے؟

اس تحقیقی مطالعہ میں حصہ لینا ضروری نہیں ہے۔ حصہ لینے یا نہ لینے کا فیصلہ آپ پر ہے۔ اگر آپ مطالعہ میں حصہ نہ لینے کا فیصلہ کرتے ہیں تو آپ کو ملنے والی دیکھ بھال میں کوئی تبدیلی نہیں آئے گی۔ تحقیقی مطالعہ میں آپ کی شرکت رضاکارانہ ہوگی۔ اس معلوماتی خط میں فراہم کردہ معلومات کو سمجھنے کے بعد، ہم ایک رضامندی کا فارم فراہم کریں گے، اگر آپ مطالعہ میں حصہ لینے پر راضی ہیں، تو آپ کو رضامندی کا فارم پُر کرنا ہوگا اور اس پر دستخط کرنا ہوں گے (یا اپنے انگوٹھے کا نشان لگائیں گے)۔

میں اس تحقیقی مطالعہ میں کیسے شریک ہو سکتا ہوں؟

اگر آپ اس تحقیقی مطالعہ میں شامل ہونا چاہتے ہیں تو آپ اس معلوماتی خط کے آخر میں رابطہ کی تفصیلات میں فراہم کردہ رابطہ نمبر یا ای میل ایڈریس کا استعمال کرتے ہوئے محقق، ڈاکٹر عاتک عرش سے رابطہ کر سکتے ہیں۔ آپ مطالعہ میں شامل ہونے کے لئے اس معلوماتی خط کے ساتھ دستیاب لفافہ بھی استعمال کر سکتے ہیں۔

اگر میں اس تحقیقی مطالعہ میں حصہ لوں تو مجھے کیا کرنا پڑے گا؟

رضامندی فارم پر دستخط کرنے کے بعد محقق، آپ کے ساتھ دو ورکشاپس کا شیڈول شیئر کریں گے جو خیبر میڈیکل یونیورسٹی پشاور میں منعقد کی جائیں گی۔ ہر ورکشاپ تقریباً 4 گھنٹے کا ہوگا اور مئی اور جون 2023 کے مہینے میں ان کا انعقاد کیا جائے گا۔ ورکشاپس کا شیڈول آپ کے ساتھ پیشگی شیئر کیا جائے گا۔ اگر آپ کے لئے دونوں ورکشاپوں میں حصہ لینا ممکن نہیں ہے تو، آپ صرف پہلی یا دوسری ورکشاپ میں بھی حصہ لے سکتے ہیں۔ ورکشاپ کے دوران، سہولت کار آپ سے کچھ سوالات پوچھیں گے اور آپ کو کچھ تحریری سرگرمیاں انجام دینے کے لئے دی جائے گی۔ زیادہ تر سرگرمیاں گروپس میں ہوں گی اور تمام سرگرمیاں ثقافتی اور مذہبی طور پر مناسب ہوں گی۔ آپ کسی بھی سوال یا سرگرمی کو چھوڑنے کے لئے آزاد ہوں گے، اگر وہ سوال یا سرگرمی آپ کے لیے مناسب نہ ہو۔ ورکشاپ کے دوران اردو یا پشتون زبان استعمال کی جائے گی۔ اگر آپ کو ورکشاپ کے دوران کسی بھی سوال یا سرگرمی کے بارے میں وضاحت کی ضرورت ہو تو آپ سہولت کاروں سے سوالات پوچھ سکتے ہیں۔ ورکشاپ غیر رسمی ہوگی اور اس میں کوئی صحیح یا غلط جواب کا تصور نہیں ہوگا۔

اس تحقیقی مطالعہ میں حصہ لینے کے کیا فوائد ہیں؟

آپ کو مطالعہ میں حصہ لینے کا کوئی براہ راست فائدہ نہیں ہوگا، تاہم، آپ کو انٹرویو لینے والے کے ساتھ اپنے صحت کی دیکھ بھال کے تجربات پر بات کرنے کا موقع ملے گا۔ اس کے علاوہ، آپ کی فراہم کردہ معلومات کا استعمال ذیابیطس اور ڈپریشن کے علاج کو بہتر بنانے کے لیے کیا جائے گا۔

تحقیقی مطالعہ میں حصہ لینے کے کیا نقصانات یا خطرات ہیں؟

تحقیقی مطالعہ میں حصہ لینے کی صورت میں آپ کا وقت درکار ہوگا۔ آپ کو اس جگہ کا سفر کرنا پڑے گا، جہاں پر ورکشاپ کا انعقاد کیا جائے گا۔ ہم مطالعہ میں حصہ لینے کے لیے آپ کے کسی بھی اخراجات کی تلافی نہیں کر سکیں گے۔

ورکشاپ کے دوران اپنے تجربات پر گفتگو کرتے ہوئے آپ پریشان ہو سکتے ہیں۔ اگر آپ پریشانی محسوس کرتے ہیں یا سوالات سے مطمئن نہیں ہیں، تو آپ کسی بھی وقت ورکشاپ میں حصہ لینا چھوڑ سکتے ہیں۔ اگر آپ کو ورکشاپ کے دوران کسی بھی مدد کی ضرورت ہو تو آپ ورکشاپ کے سہولت کاروں کو مطلع کر سکتے ہیں۔ کیا میں کسی بھی وقت تحقیقی مطالعہ سے دستبردار ہو سکتا ہوں؟

آپ بغیر وجہ بتائے کسی بھی وقت مطالعہ سے دستبردار ہونے کے لیے آزاد ہیں۔ آپ کو کسی بھی سوال کا جواب دینے یا کوئی ایسی سرگرمی انجام دینے کی ضرورت نہیں ہے جس سے آپ پریشانی محسوس کر سکتے ہیں۔ آپ کسی بھی وقت ورکشاپ چھوڑ کر جا سکتے ہیں، لیکن آپ سے جمع کی گئی معلومات کو مطالعہ میں استعمال کیا جائے گا۔

اگر آپ مطالعہ سے خود کو یا اپنے ڈیٹا کو واپس لینے کا فیصلہ کرتے ہیں تو آپ کو ملنے والی دیکھ بھال میں کوئی تبدیلی نہیں آئے گی۔

میں جو معلومات اور ذاتی ڈیٹا دیتا ہوں اسے کیسے استعمال کیا جائے گا؟

آپ جو بھی معلومات دیں گے ہم اسے رازدارانہ تصور کریں گے۔ ہم آپ کی فراہم کردہ تمام معلومات کو محفوظ طریقے سے سنبھالے گے۔ ہم جمع کردہ ڈیٹا سے تمام قابل شناخت معلومات کو ہٹا دیں گے۔ آپ سے جمع کیے گئے دستاویزات کو خیبر میڈیکل یونیورسٹی پشاور میں ایک بند الماری میں رکھا جائے گا۔ الیکٹرانک ڈیٹا کو پاس ورڈ کے ذریعے محفوظ فولڈر میں رکھا جائے گا اور اسے خیبر میڈیکل یونیورسٹی پشاور کے ایک محفوظ کمپیوٹر سرور پر رکھا جائے گا۔ ڈیٹا کو 10 سال تک برقرار رکھا جائے گا اور پھر یونیورسٹی آف یارک کی پالیسی کے مطابق ضائع کر دیا جائے گا۔

براہ کرم نوٹ کریں کہ ہم آپ سے جمع کردہ معلومات کو اس وقت تک رازداری سے رکھیں گے جب تک کہ آپ ایسی معلومات کا انکشاف نہیں کرتے جو آپ کو یا دوسروں کو نقصان پہنچانے کے خطرے کی نشاندہی کرتی ہے۔ اس صورت حال میں ہم آپ کے اعتماد کو برقرار رکھتے ہوئے پی ایچ ڈی سپروائزر کو مطلع کریں گے، جو ضرورت پڑنے پر آپ سے رابطہ کر سکتی ہے۔ مطالعہ کے حصے کے طور پر آپ سے موصول ہونے والی معلومات کو ہم کس طرح استعمال کرتے ہیں اس بارے میں آپ کے کسی بھی سوال کا جواب دینے میں ہمیں خوشی ہوگی۔

درج ذیل لنکس کے ذریعے، آپ ان ویب صفحات تک رسائی حاصل کر سکتے ہیں جن میں جنرل ڈیٹا پروٹیکشن ریگولیشن اور ڈیٹا مینجمنٹ کے بارے میں عمومی معلومات موجود ہیں۔

<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/>
<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/research-participants/>
مزید معلومات کے لیے، آپ درج ذیل ویب صفحات کا مطالعہ کر سکتے ہیں۔

<https://www.york.ac.uk/records-management/dp/>
<https://www.york.ac.uk/records-management/dp/guidance/gdprcompliantresearch/>
<https://www.york.ac.uk/records-management/dp/your-info/generalprivacynotice/>
تحقیقی مطالعہ کے نتائج کا کیا ہوگا؟

تحقیقی مطالعہ کے نتائج تعلیمی جرائد میں شائع کیے جائیں گے اور تحقیقی کانفرنسوں میں پیش کیے جائیں گے۔ تحقیقی مطالعہ کے نتائج کو معاشرے کے اراکین کے ساتھ مختصر رپورٹس کے ذریعے پھیلا دیا جائے گا جو سوشل میڈیا اور مقامی میگزینوں اور اخبارات کے ذریعے شیئر کیے جائیں گے۔ مزید برآں، مطالعہ کے نتائج ڈیٹابیس اور ڈپریشن کی دیکھ بھال کو بہتر بنانے میں مدد کریں گے۔

کس نے اس مطالعہ کا جائزہ لیا اور اس کی منظوری دی؟
یونیورسٹی آف یارک کی ہیلتھ سائنسز ریسرچ گورننس کمیٹی اور خیبر میڈیکل یونیورسٹی پشاور کے اخلاقیات بورڈ نے اس تحقیقی مطالعہ کا جائزہ لیا اور اسے منظوری دی۔

اگر میں مطالعہ میں شامل ہونا چاہتے ہوں یا مجھے مطالعہ کے بارے میں مزید معلومات درکار ہوں، تو میں کس سے رابطہ کروں؟
اگر آپ تحقیقی مطالعہ میں شامل ہونا چاہتے ہیں یا آپ کو اس تحقیقی مطالعہ کے بارے میں مزید معلومات درکار ہوں تو آپ مندرجہ ذیل ای میل ایڈریس یا رابطہ نمبر پر رابطہ کر سکتے ہیں۔

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شکایت کی صورت میں، میں کس سے رابطہ کروں؟

عام شکایات کے لیے آپ درج ذیل پی ایچ ڈی سپروائزر سے رابطہ کر سکتے ہیں۔
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اگر آپ اپنے ذاتی ڈیٹا کو سنبھالنے کے طریقے سے ناخوش ہیں، تو آپ یونیورسٹی آف یارک ڈیٹا پروٹیکشن آفیسر سے درج ذیل ای میل پر شکایت کر سکتے ہیں؛

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اگر آپ مذکورہ بالا حکام کے جواب سے غیر مطمئن ہیں، تو آپ کو انفارمیشن کمشنر کے دفتر میں درج ذیل ویب سائٹ کے ذریعے تشویش کی اطلاع دینے کا حق ہے۔

www.ico.org.uk/concerns

اس معلوماتی خط کو پڑھنے کے لیے وقت نکالنے کے لیے آپ کا شکریہ۔

معلوماتی خط برائے شرکاء (مریضوں کے دیکھ بھال کرنے والے شرکاء)

ہم آپ کو مذکورہ مطالعہ میں حصہ لینے کے لیے مدعو کرنا چاہتے ہیں لیکن اس سے پہلے کہ آپ فیصلہ کریں، براہ کرم درج ذیل معلومات کو پڑھیں۔

اس مطالعہ کا مقصد کیا ہے؟

ہم ایک تحقیقی مطالعہ کر رہے ہیں، جس کا مقصد ذیابیطس اور ڈپریشن میں مبتلا خواتین میں جسمانی سرگرمی کو فروغ دینے کے لئے نفسیاتی طریقہ علاج "ہیپورل ایکٹیویشن" کا استعمال ہے۔ ذیابیطس اور ڈپریشن میں مبتلا خواتین اکثر جسمانی طور پر غیر فعال ہوتی ہیں اور انہیں جسمانی سرگرمی کرنے کی ترغیب دینے کے لئے نفسیاتی طریقہ علاج "ہیپورل ایکٹیویشن" کا استعمال کیا جاسکتا ہے کیونکہ نفسیاتی طریقہ علاج "ہیپورل ایکٹیویشن" معمول، ضروری اور خوشگوار سرگرمیوں کو فروغ دینے میں معاونت کرتی ہے۔ لہذا، ہم خواتین میں جسمانی سرگرمی کو فروغ دینے کے لئے نفسیاتی طریقہ علاج "ہیپورل ایکٹیویشن" کو استعمال کرنا چاہتے ہیں، جس کے لئے ہمیں آپ کے خیالات اور تجربات کو بہتر طور پر سمجھنے کی ضرورت ہے۔

مطالعہ کون کر رہا ہے؟

یہ تحقیقی مطالعہ عاتک عرش کریں گے، جو یونیورسٹی آف یارک، برطانیہ میں پی ایچ ڈی کے طالب علم ہیں۔ یہ تحقیقی مطالعہ پی ایچ ڈی ڈگری کی تکمیل کے لیے کیے جانے والے تحقیق کا حصہ ہے۔

مجھے شرکت کے لیے کیوں کہا گیا ہے؟

ذیابیطس اور ڈپریشن میں مبتلا خواتین میں جسمانی سرگرمی کو فروغ دینے کے لئے نفسیاتی طریقہ علاج "ہیپورل ایکٹیویشن" کے استعمال کے بارے میں مریضوں، ان کے دیکھ بھال کرنے والوں، اور صحت کے عملے کے خیالات، تاثرات اور تجربات کو دریافت کرنے کے لیے، ہم یہ مطالعہ کر رہے ہیں۔ چونکہ آپ ایک ایسے شخص کی دیکھ بھال کر رہے ہیں، جو ذیابیطس اور ڈپریشن کا شکار ہے، اس لیے آپ کو اس تحقیقی مطالعہ میں شرکت کے لیے مدعو کیا جا رہا ہے۔

کیا اس تحقیقی مطالعہ میں حصہ لینا ضروری ہے؟

اس تحقیقی مطالعہ میں حصہ لینا ضروری نہیں ہے۔ حصہ لینے یا نہ لینے کا فیصلہ آپ پر ہے۔ اگر آپ مطالعہ میں حصہ نہ لینے کا فیصلہ کرتے ہیں تو آپ کے خاندان کے رکن کو ملنے والی دیکھ بھال میں کوئی تبدیلی نہیں آئے گی۔

تحقیقی مطالعہ میں آپ کی شرکت رضاکارانہ ہوگی۔ اس معلوماتی خط میں فراہم کردہ معلومات کو سمجھنے کے بعد، ہم ایک رضامندی کا فارم فراہم کریں گے، اگر آپ مطالعہ میں حصہ لینے پر راضی ہیں، تو آپ کو رضامندی کا فارم پُر کرنا ہوگا اور اس پر دستخط کرنا ہوں گے (یا اپنے انگوٹھے کا نشان لگائیں گے)۔

میں اس تحقیقی مطالعہ میں کیسے شریک ہو سکتا ہوں؟

اگر آپ اس تحقیقی مطالعہ میں شامل ہونا چاہتے ہیں تو آپ اس معلوماتی خط کے آخر میں رابطے کی تفصیلات میں فراہم کردہ رابطہ نمبر یا ای میل ایڈریس کا استعمال کرتے ہوئے محقق، ڈاکٹر عاتک عرش سے رابطہ کر سکتے ہیں۔ آپ مطالعہ میں شامل ہونے کے لئے اس معلوماتی خط کے ساتھ دستیاب لفافہ بھی استعمال کر سکتے ہیں۔

اگر میں اس تحقیقی مطالعہ میں حصہ لوں تو مجھے کیا کرنا پڑے گا؟

رضامندی فارم پر دستخط کرنے کے بعد محقق، آپ کے ساتھ دو ورکشاپس کا شیڈول شیئر کریں گے جو خیبر میڈیکل یونیورسٹی پشاور میں منعقد کی جائیں گی۔ ہر ورکشاپ تقریباً 4 گھنٹے کا ہوگا اور مئی اور جون 2023 کے مہینے میں ان کا انعقاد کیا جائے گا۔ ورکشاپس کا شیڈول آپ کے ساتھ پیشگی شیئر کیا جائے گا۔ اگر آپ کے لئے دونوں ورکشاپوں میں حصہ لینا ممکن نہیں ہے تو، آپ صرف پہلی یا دوسری ورکشاپ میں بھی حصہ لے سکتے ہیں۔ ورکشاپ کے دوران، سہولت کار آپ سے کچھ سوالات پوچھیں گے اور آپ کو کچھ تحریری سرگرمیاں انجام دینے کے لئے دی جائے گی۔ زیادہ تر سرگرمیاں گروپس میں ہوں گی اور تمام سرگرمیاں ثقافتی اور مذہبی طور پر مناسب ہوں گی۔ آپ کسی بھی سوال یا سرگرمی کو چھوڑنے کے لئے آزاد ہوں گے، اگر وہ سوال یا سرگرمی آپ کے لیے مناسب نہ ہو۔ ورکشاپ کے دوران اردو یا پشتون زبان استعمال کی جائے گی۔ اگر آپ کو ورکشاپ کے دوران کسی بھی سوال یا سرگرمی کے بارے میں وضاحت کی ضرورت ہو تو آپ سہولت کاروں سے سوالات پوچھ سکتے ہیں۔ ورکشاپ غیر رسمی ہوگی اور اس میں کوئی صحیح یا غلط جواب کا تصور نہیں ہوگا۔

اس تحقیقی مطالعہ میں حصہ لینے کے کیا فوائد ہیں؟

آپ کو مطالعہ میں حصہ لینے کا کوئی براہ راست فائدہ نہیں ہوگا، تاہم، آپ کو انٹرویو لینے والے کے ساتھ اپنے تجربات پر بات کرنے کا موقع ملے گا۔ اس کے علاوہ، آپ کی فراہم کردہ معلومات کا استعمال ذیابیطس اور ڈپریشن کے علاج کو بہتر بنانے کے لیے کیا جائے گا۔

تحقیقی مطالعہ میں حصہ لینے کے کیا نقصانات یا خطرات ہیں؟

تحقیقی مطالعہ میں حصہ لینے کی صورت میں آپ کا وقت درکار ہوگا۔ آپ کو اس جگہ کا سفر کرنا پڑے گا، جہاں پرو ورکشاپ کا انعقاد کیا جائے گا۔ ہم مطالعہ میں حصہ لینے کے لیے آپ کے کسی بھی اخراجات کی تلافی نہیں کر سکیں گے۔

ورکشاپ کے دوران اپنے تجربات پر گفتگو کرتے ہوئے آپ پریشان ہو سکتے ہیں۔ اگر آپ پریشانی محسوس کرتے ہیں یا سوالات سے مطمئن نہیں ہیں، تو آپ کسی بھی وقت ورکشاپ میں حصہ لینا چھوڑ سکتے ہیں۔ اگر آپ کو ورکشاپ کے دوران کسی بھی مدد کی ضرورت ہو تو آپ ورکشاپ کے سہولت کاروں کو مطلع کر سکتے ہیں۔ کیا میں کسی بھی وقت تحقیقی مطالعہ سے دستبردار ہو سکتا ہوں؟

آپ بغیر وجہ بتائے کسی بھی وقت مطالعہ سے دستبردار ہونے کے لیے آزاد ہیں۔ آپ کو کسی بھی سوال کا جواب دینے یا کوئی ایسی سرگرمی انجام دینے کی ضرورت نہیں ہے جس سے آپ پریشانی محسوس کر سکتے ہیں۔ آپ کسی بھی وقت ورکشاپ چھوڑ کر جاسکتے ہیں، لیکن آپ سے جمع کی گئی معلومات کو مطالعہ میں استعمال کیا جائے گا۔

اگر آپ مطالعہ سے اپنے آپ کو یا اپنے ڈیٹا کو واپس لینے کا فیصلہ کرتے ہیں تو آپ یا آپ کے خاندان کے ممبر کو جو دیکھ بھال ملتی ہے، اس میں کوئی تبدیلی نہیں آئے گی۔

میں جو معلومات اور ذاتی ڈیٹا دیتا ہوں اسے کیسے استعمال کیا جائے گا؟

آپ جو بھی معلومات دیں گے ہم اسے رازدارانہ تصور کریں گے۔ ہم آپ کی فراہم کردہ تمام معلومات کو محفوظ طریقے سے سنبھالے گے۔ ہم جمع کردہ ڈیٹا سے تمام قابل شناخت معلومات کو ہٹا دیں گے۔ آپ سے جمع کیے گئے دستاویزات کو خیبر میڈیکل یونیورسٹی پشاور میں ایک بند الماری میں رکھا جائے گا۔ الیکٹرانک ڈیٹا کو پاس ورڈ کے ذریعے محفوظ فولڈر میں رکھا جائے گا اور اسے خیبر میڈیکل یونیورسٹی پشاور کے ایک محفوظ کمپیوٹر سرور پر رکھا جائے گا۔ ڈیٹا کو 10 سال تک برقرار رکھا جائے گا اور پھر یونیورسٹی آف یارک کی پالیسی کے مطابق ضائع کر دیا جائے گا۔

براہ کرم نوٹ کریں کہ ہم آپ سے جمع کردہ معلومات کو اس وقت تک رازداری سے رکھیں گے جب تک کہ آپ ایسی معلومات کا انکشاف نہیں کرتے جو آپ کو یا دوسروں کو نقصان پہنچانے کے خطرے کی نشاندہی کرتی ہے۔ اس صورت حال میں ہم آپ کے اعتماد کو برقرار رکھتے ہوئے پی ایچ ڈی سپروائزر کو مطلع کریں گے، جو ضرورت پڑنے پر آپ سے رابطہ کر سکتی ہے۔ مطالعہ کے حصے کے طور پر آپ سے موصول ہونے والی معلومات کو ہم کس طرح استعمال کرتے ہیں اس بارے میں آپ کے کسی بھی سوال کا جواب دینے میں ہمیں خوشی ہوگی۔

درج ذیل لنکس کے ذریعے، آپ ان ویب صفحات تک رسائی حاصل کر سکتے ہیں جن میں جنرل ڈیٹا پروٹیکشن ریگولیشن اور ڈیٹا مینجمنٹ کے بارے میں عمومی معلومات موجود ہیں۔

<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/>
<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/research-participants/>
مزید معلومات کے لیے، آپ درج ذیل ویب صفحات کا مطالعہ کر سکتے ہیں۔

<https://www.york.ac.uk/records-management/dp/>
<https://www.york.ac.uk/records-management/dp/guidance/gdprcompliantresearch/>
<https://www.york.ac.uk/records-management/dp/your-info/generalprivacynotice/>
تحقیقی مطالعہ کے نتائج کا کیا ہوگا؟

تحقیقی مطالعہ کے نتائج تعلیمی جرائد میں شائع کیے جائیں گے اور تحقیقی کانفرنسوں میں پیش کیے جائیں گے۔ تحقیقی مطالعہ کے نتائج کو معاشرے کے اراکین کے ساتھ مختصر رپورٹس کے ذریعے پھیلا دیا جائے گا جو سوشل میڈیا اور مقامی میگزینوں اور اخبارات کے ذریعے شیئر کیے جائیں گے۔ مزید برآں، مطالعہ کے نتائج ڈیٹابیس اور ڈپریشن کی دیکھ بھال کو بہتر بنانے میں مدد کریں گے۔

کس نے اس مطالعہ کا جائزہ لیا اور اس کی منظوری دی؟
یونیورسٹی آف یارک کی ہیلتھ سائنسز ریسرچ گورننس کمیٹی اور خیبر میڈیکل یونیورسٹی پشاور کے اخلاقیات بورڈ نے اس تحقیقی مطالعہ کا جائزہ لیا اور اسے منظوری دی۔
اگر میں مطالعہ میں شامل ہونا چاہتے ہوں یا مجھے مطالعہ کے بارے میں مزید معلومات درکار ہوں، تو میں کس سے رابطہ کروں؟
اگر آپ تحقیقی مطالعہ میں شامل ہونا چاہتے ہیں یا آپ کو اس تحقیقی مطالعہ کے بارے میں مزید معلومات درکار ہوں تو آپ مندرجہ ذیل ای میل ایڈریس یا رابطہ نمبر پر رابطہ کر سکتے ہیں۔

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شکایت کی صورت میں، میں کس سے رابطہ کروں؟

عام شکایات کے لیے آپ درج ذیل پی ایچ ڈی سپروائزر سے رابطہ کر سکتے ہیں۔
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اگر آپ اپنے ذاتی ڈیٹا کو سنبھالنے کے طریقے سے ناخوش ہیں، تو آپ یونیورسٹی آف یارک ڈیٹا پروٹیکشن آفیسر سے درج ذیل ای میل پر شکایت کر سکتے ہیں؛

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اگر آپ مذکورہ بالا حکام کے جواب سے غیر مطمئن ہیں، تو آپ کو انفارمیشن کمشنر کے دفتر میں درج ذیل ویب سائٹ کے ذریعے تشویش کی اطلاع دینے کا حق ہے؛ -

www.ico.org.uk/concerns

اس معلوماتی خط کو پڑھنے کے لیے وقت نکالنے کے لیے آپ کا شکریہ۔

معلوماتی خط برائے شرکاء (صحت کا عملہ)

ہم آپ کو مذکورہ مطالعہ میں حصہ لینے کے لیے مدعو کرنا چاہتے ہیں لیکن اس سے پہلے کہ آپ فیصلہ کریں، براہ کرم درج ذیل معلومات کو پڑھیں۔

اس مطالعہ کا مقصد کیا ہے؟

ہم ایک تحقیقی مطالعہ کر رہے ہیں، جس کا مقصد ذیابیطس اور ڈپریشن میں مبتلا خواتین میں جسمانی سرگرمی کو فروغ دینے کے لئے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کا استعمال ہے۔ ذیابیطس اور ڈپریشن میں مبتلا خواتین اکثر جسمانی طور پر غیر فعال ہوتی ہیں اور انہیں جسمانی سرگرمی کرنے کی ترغیب دینے کے لئے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کا استعمال کیا جاسکتا ہے کیونکہ نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" معمول، ضروری اور خوشگوار سرگرمیوں کو فروغ دینے میں معاونت کرتی ہے۔ لہذا، ہم خواتین میں جسمانی سرگرمی کو فروغ دینے کے لئے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کو استعمال کرنا چاہتے ہیں، جس کے لئے ہمیں آپ کے خیالات اور تجربات کو بہتر طور پر سمجھنے کی ضرورت ہے۔

مطالعہ کون کر رہا ہے؟

یہ تحقیقی مطالعہ عاتک عرش کریں گے، جو یونیورسٹی آف یارک، برطانیہ میں پی ایچ ڈی کے طالب علم ہیں۔ یہ تحقیقی مطالعہ پی ایچ ڈی ڈگری کی تکمیل کے لیے کیے جانے والے تحقیق کا حصہ ہے۔

مجھے شرکت کے لیے کیوں کہا گیا ہے؟

ذیابیطس اور ڈپریشن میں مبتلا خواتین میں جسمانی سرگرمی کو فروغ دینے کے لئے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کے استعمال کے بارے میں مریضوں، ان کے دیکھ بھال کرنے والوں، اور صحت کے عملے کے خیالات، تاثرات اور تجربات کو دریافت کرنے کے لیے، ہم یہ مطالعہ کر رہے ہیں۔ آپ کی شناخت صحت کی دیکھ بھال کرنے والے عملے کے طور پر ہوئی ہے جو ذیابیطس اور ڈپریشن کی تشخیص والے مریضوں کی دیکھ بھال کرتا ہے، اس لیے آپ کو مطالعہ میں شرکت کے لیے مدعو کیا جا رہا ہے۔

کیا اس تحقیقی مطالعہ میں حصہ لینا ضروری ہے؟

اس تحقیقی مطالعہ میں حصہ لینا ضروری نہیں ہے۔ حصہ لینے یا نہ لینے کا فیصلہ آپ پر ہے۔ اگر آپ مطالعہ میں حصہ نہ لینے کا فیصلہ کرتے ہیں تو آپ کی ملازمت پر کوئی اثر نہیں پڑے گا۔ تحقیقی مطالعہ میں آپ کی شرکت رضاکارانہ ہوگی۔ اس معلوماتی خط میں فراہم کردہ معلومات کو سمجھنے کے بعد، ہم ایک رضامندی کا فارم فراہم کریں گے، اگر آپ مطالعہ میں حصہ لینے پر راضی ہیں، تو آپ کو رضامندی کا فارم پُر کرنا ہوگا اور اس پر دستخط کرنا ہوں گے (یا اپنے انگوٹھے کا نشان لگائیں گے)۔

میں اس تحقیقی مطالعہ میں کیسے شریک ہو سکتا ہوں؟

اگر آپ اس تحقیقی مطالعہ میں شامل ہونا چاہتے ہیں تو آپ اس معلوماتی خط کے آخر میں رابطے کی تفصیلات میں فراہم کردہ رابطہ نمبر یا ای میل ایڈریس کا استعمال کرتے ہوئے محقق، 'ڈاکٹر عاتک عرش' سے رابطہ کر سکتے ہیں۔ آپ مطالعہ میں شامل ہونے کے لئے اس معلوماتی خط کے ساتھ دستیاب لفافہ بھی استعمال کر سکتے ہیں۔

اگر میں اس تحقیقی مطالعہ میں حصہ لوں تو مجھے کیا کرنا پڑے گا؟

رضامندی فارم پر دستخط کرنے کے بعد محقق، آپ کے ساتھ دو ورکشاپس کا شیڈول شیئر کریں گے جو خیبر میڈیکل یونیورسٹی پشاور میں منعقد کی جائیں گی۔ ہر ورکشاپ تقریباً 4 گھنٹے کا ہوگا اور مئی اور جون 2023 کے مہینے میں ان کا انعقاد کیا جائے گا۔ ورکشاپس کا شیڈول آپ کے ساتھ پیشگی شیئر کیا جائے گا۔ اگر آپ کے لئے دونوں ورکشاپوں میں حصہ لینا ممکن نہیں ہے تو، آپ صرف پہلی یا دوسری ورکشاپ میں بھی حصہ لے سکتے ہیں۔ ورکشاپ کے دوران، سہولت کار آپ سے کچھ سوالات پوچھیں گے اور آپ کو کچھ تحریری سرگرمیاں انجام دینے کے لئے دی جائے گی۔ زیادہ تر سرگرمیاں گروپس میں ہوں گی اور تمام سرگرمیاں ثقافتی اور مذہبی طور پر مناسب ہوں گی۔ آپ کسی بھی سوال یا سرگرمی کو چھوڑنے کے لئے آزاد ہوں گے، اگر وہ سوال یا سرگرمی آپ کے لیے مناسب نہ ہو۔ ورکشاپ کے دوران اردو یا پشتون زبان استعمال کی جائے گی۔ اگر آپ کو ورکشاپ کے دوران کسی بھی سوال یا سرگرمی کے بارے میں وضاحت کی ضرورت ہو تو آپ سہولت کاروں سے سوالات پوچھ سکتے ہیں۔ ورکشاپ غیر رسمی ہوگی اور اس میں کوئی صحیح یا غلط جواب کا تصور نہیں ہوگا۔

اس تحقیقی مطالعہ میں حصہ لینے کے کیا فوائد ہیں؟

آپ کو مطالعہ میں حصہ لینے کا کوئی براہ راست فائدہ نہیں ہوگا، تاہم، آپ کو انٹرویو لینے والے کے ساتھ اپنے تجربات پر بات کرنے کا موقع ملے گا۔ اس کے علاوہ، آپ کی فراہم کردہ معلومات کا استعمال ذیابیطس اور ڈپریشن کے علاج کو بہتر بنانے کے لیے کیا جائے گا۔

تحقیقی مطالعہ میں حصہ لینے کے کیا نقصانات یا خطرات ہیں؟

تحقیقی مطالعہ میں حصہ لینے کی صورت میں آپ کا وقت درکار ہوگا۔ آپ کو اس جگہ کا سفر کرنا پڑے گا، جہاں پر ورکشاپ کا انعقاد کیا جائے گا۔ ہم مطالعہ میں حصہ لینے کے لیے آپ کے کسی بھی اخراجات کی تلافی نہیں کر سکیں گے۔

ورکشاپ کے دوران اپنے تجربات پر گفتگو کرتے ہوئے آپ پریشان ہو سکتے ہیں۔ اگر آپ پریشانی محسوس کرتے ہیں یا سوالات سے مطمئن نہیں ہیں، تو آپ کسی بھی وقت ورکشاپ میں حصہ لینا چھوڑ سکتے ہیں۔ اگر آپ کو ورکشاپ کے دوران کسی بھی مدد کی ضرورت ہو تو آپ ورکشاپ کے سہولت کاروں کو مطلع کر سکتے ہیں۔

کیا میں کسی بھی وقت تحقیقی مطالعہ سے دستبردار ہو سکتا ہوں؟

آپ بغیر وجہ بتائے کسی بھی وقت مطالعہ سے دستبردار ہونے کے لیے آزاد ہیں۔ آپ کو کسی بھی سوال کا جواب دینے یا کوئی ایسی سرگرمی انجام دینے کی ضرورت نہیں ہے جس سے آپ پریشانی محسوس کر سکتے ہیں۔ آپ کسی بھی وقت ورکشاپ چھوڑ کر جا سکتے ہیں، لیکن آپ سے جمع کی گئی معلومات کو مطالعہ میں استعمال کیا جائے گا۔

اگر آپ مطالعہ سے خود کو یا اپنے ڈیٹا کو واپس لینے کا فیصلہ کرتے ہیں تو آپ کی ملازمت پر کوئی اثر نہیں پڑے گا۔

میں جو معلومات اور ذاتی ڈیٹا دیتا ہوں اسے کیسے استعمال کیا جائے گا؟

آپ جو بھی معلومات دیں گے ہم اسے رازدارانہ تصور کریں گے۔ ہم آپ کی فراہم کردہ تمام معلومات کو محفوظ طریقے سے سنبھالے گے۔ ہم جمع کردہ ڈیٹا سے تمام قابل شناخت معلومات کو ہٹا دیں گے۔ آپ سے جمع کیے گئے دستاویزات کو خیبر میڈیکل یونیورسٹی پشاور میں ایک بند الماری میں رکھا جائے گا۔ الیکٹرانک ڈیٹا کو پاس ورڈ کے ذریعے محفوظ فولڈر میں رکھا جائے گا اور اسے خیبر میڈیکل یونیورسٹی پشاور کے ایک محفوظ کمپیوٹر سرور پر رکھا جائے گا۔ ڈیٹا کو 10 سال تک برقرار رکھا جائے گا اور پھر یونیورسٹی آف یارک کی پالیسی کے مطابق ضائع کر دیا جائے گا۔

براہ کرم نوٹ کریں کہ ہم آپ سے جمع کردہ معلومات کو اس وقت تک رازداری سے رکھیں گے جب تک کہ آپ ایسی معلومات کا انکشاف نہیں کرتے جو آپ کو یا دوسروں کو نقصان پہنچانے کے خطرے کی نشاندہی کرتی ہے۔ اس صورت حال میں ہم آپ کے اعتماد کو برقرار رکھتے ہوئے پی ایچ ڈی سپروائزر کو مطلع کریں گے، جو ضرورت پڑنے پر آپ سے رابطہ کر سکتی ہے۔ مطالعہ کے حصے کے طور پر آپ سے موصول ہونے والی معلومات کو ہم کس طرح استعمال کرتے ہیں اس بارے میں آپ کے کسی بھی سوال کا جواب دینے میں ہمیں خوشی ہوگی۔

درج ذیل لنکس کے ذریعے، آپ ان ویب صفحات تک رسائی حاصل کر سکتے ہیں جن میں جنرل ڈیٹا پروٹیکشن ریگولیشن اور ڈیٹا مینجمنٹ کے بارے میں عمومی معلومات موجود ہیں۔

<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/>
<https://www.york.ac.uk/healthsciences/research/trials/trials-gdpr/research-participants/>
مزید معلومات کے لیے، آپ درج ذیل ویب صفحات کا مطالعہ کر سکتے ہیں۔

<https://www.york.ac.uk/records-management/dp/>
<https://www.york.ac.uk/records-management/dp/guidance/gdprcompliantresearch/>
<https://www.york.ac.uk/records-management/dp/your-info/generalprivacynotice/>
تحقیقی مطالعہ کے نتائج کا کیا ہوگا؟

تحقیقی مطالعہ کے نتائج تعلیمی جرائد میں شائع کیے جائیں گے اور تحقیقی کانفرنسوں میں پیش کیے جائیں گے۔ تحقیقی مطالعہ کے نتائج کو معاشرے کے اراکین کے ساتھ مختصر رپورٹس کے ذریعے پھیلا دیا جائے گا جو سوشل میڈیا اور مقامی میگزینوں اور اخبارات کے ذریعے شیئر کیے جائیں گے۔ مزید برآں، مطالعہ کے نتائج ڈیٹابیس اور ڈپریشن کی دیکھ بھال کو بہتر بنانے میں مدد کریں گے۔

کس نے اس مطالعہ کا جائزہ لیا اور اس کی منظوری دی؟
یونیورسٹی آف یارک کی ہیلتھ سائنسز ریسرچ گورننس کمیٹی اور خیبر میڈیکل یونیورسٹی پشاور کے اخلاقیات بورڈ نے اس تحقیقی مطالعہ کا جائزہ لیا اور اسے منظوری دی۔
اگر میں مطالعہ میں شامل ہونا چاہتے ہوں یا مجھے مطالعہ کے بارے میں مزید معلومات درکار ہوں، تو میں کس سے رابطہ کروں؟
اگر آپ تحقیقی مطالعہ میں شامل ہونا چاہتے ہیں یا آپ کو اس تحقیقی مطالعہ کے بارے میں مزید معلومات درکار ہوں تو آپ مندرجہ ذیل ای میل ایڈریس یا رابطہ نمبر پر رابطہ کر سکتے ہیں۔

ڈاکٹر عاتک عرش

ای میل: aa2723@york.ac.uk

موبائل نمبر: +92 344-6997046

شکایت کی صورت میں، میں کس سے رابطہ کروں؟

عام شکایات کے لیے آپ درج ذیل پی ایچ ڈی سپروائزر سے رابطہ کر سکتے ہیں۔
پروفیسر نجمہ صدیقی

ای میل: najma.siddiqi@york.ac.uk

ڈاکٹر صائمہ آفاق

ای میل: saima.afaq@york.ac.uk

اگر آپ اپنے ذاتی ڈیٹا کو سنبھالنے کے طریقے سے ناخوش ہیں، تو آپ یونیورسٹی آف یارک ڈیٹا پروٹیکشن آفیسر سے درج ذیل ای میل پر شکایت کر سکتے ہیں؛

dataprotection@york.ac.uk

اگر آپ مذکورہ بالا حکام کے جواب سے غیر مطمئن ہیں، تو آپ کو انفارمیشن کمشنر کے دفتر میں درج ذیل ویب سائٹ کے ذریعے تشویش کی اطلاع دینے کا حق ہے۔

www.ico.org.uk/concerns

اس معلوماتی خط کو پڑھنے کے لیے وقت نکالنے کے لیے آپ کا شکریہ۔

Participant consent form: English version



Participant Consent Form

**“Adaptation of a Behavioural Activation intervention to promote physical activity
among women with depression and type 2 diabetes mellitus in Pakistan”**

	Please confirm agreement to each statement by putting your initials in the boxes below
I have read and understood the participant information sheet [dated 18 th April 2023, version 1.2]	
I have had the opportunity to ask questions and discuss this study	
I have received satisfactory answers to all of my questions	
I have received enough information about the study	
I understand my participation in the study is voluntary and that I am free to withdraw from the study: - At any time Without having to give a reason for withdrawing If I withdraw, the already collected data will be used in the study	
I understand that any information I provide, including personal data, will be kept confidential, stored securely and only accessed by those carrying out the study.	
I understand that any information I give may be included in published documents, but all information will be anonymised.	
I agree to take part in this study	

Participant	Signature	
Date		
Name of Participant		
Researcher	Signature	
Date		
Name of Researcher		

Date: 18th April 2023

Version 1.2

Participant consent form: Urdu version

UNIVERSITY of York
The Department of Health Sciences

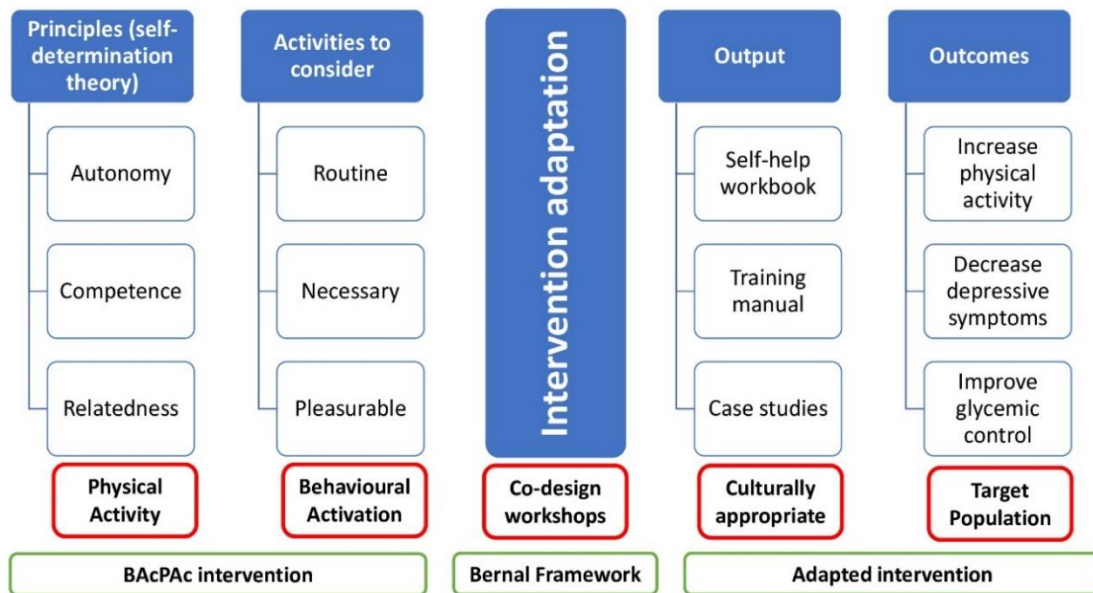
شرکت کنندہ کی رضامندی کا فارم

براہ کرم ذیل کے خانوں میں نک (✓) کا نشان لگا کر ہر بیان سے اتفاق کی تصدیق کریں۔		
	۱	میں نے شرکت کی معلوماتی خط پڑھ اور سمجھ لی ہے [تاریخ 18 اپریل 2023، ورژن 1.2]
	۲	مجھے سوالات پوچھنے اور اس مطالعہ پر بحث کرنے کا موقع ملا ہے۔
	۳	مجھے اپنے تمام سوالات کے تسلی بخش جوابات مل چکے ہیں۔
	۴	مجھے مطالعہ کے بارے میں کافی معلومات ملی ہیں۔
	۵	میں سمجھتا ہوں کہ مطالعہ میں میری شرکت رضاکارانہ ہے اور میں مطالعہ سے دستبردار ہونے کے لیے آزاد ہوں: ا۔ کسی بھی وقت ب۔ دستبردار ہونے کی وجہ بتائے بغیر ت۔ اگر میں دستبردار ہوتا/ ہوتی ہوں، محققین مجھ سے جمع کی گئی معلومات کو استعمال کر سکتے ہیں۔
	۶	میں سمجھتا/ سمجھتی ہوں کہ میں جو بھی معلومات فراہم کرتا/ کرتی ہوں، بشمول ذاتی ڈیٹا، کو خفیہ اور محفوظ طریقے سے رکھا جائے گا اور صرف مطالعہ کرنے والے افراد ہی اس تک رسائی حاصل کر سکتے ہیں۔
	۷	میں سمجھتا/ سمجھتی ہوں کہ میں جو بھی معلومات دیتا/ دیتی ہوں اسے شائع شدہ دستاویزات میں شامل کیا جاسکتا ہے لیکن تمام معلومات کو گمنام رکھا جائے گا۔
	۸	میں اس مطالعہ میں حصہ لینے کے لیے راضی ہوں۔

شرکت کنندہ کے دستخط:----- تاریخ
شرکت کنندہ کا نام:-----
محقق کا نام اور دستخط:----- تاریخ

تاریخ 18 اپریل 2023، ورژن 1.2

Appendix 8: Logic model for intervention adaptation



Appendix 9: Stirman levels and types of adaptation

Level of adaptation

1. Individual recipient level: The intervention is modified for a particular recipient (e.g., simplifying language if a patient has cognitive impairment or if language barriers exist; changes to increase cultural relevance for an individual recipient).
2. Cohort level: The intervention is modified for individuals grouped within the intervention setting into a treatment group, a class, or another type of cohort (e.g., a specific psychotherapy group, grade, or classroom).
3. Population-level: The intervention is modified for application to a particular cultural, ethnic, clinical, or social group (e.g., repetition of intervention components for all patients with cognitive impairments; development of culturally relevant vignettes to be used with all individuals of a particular ethnic identity).
4. Provider/facilitator level: Modifications are made by a clinician/facilitator for all of their participants (e.g., 'I never set an agenda when I do cognitive therapy').
5. Unit level: A modification is made by all of the facilitators in a unit (e.g., clinic/department/grade) within a larger organisation (e.g., 'We can only do 60-minute intervention sessions instead of 90-minute sessions in our clinic').
6. Hospital/Organisation level: Modifications are made by an entire organisation.
7. Network/Community level: Modifications are applied by an entire network or system of hospitals/ clinics/schools (e.g., a Veterans Affairs; school district) or community.

Types of adaptations

1. Tailoring/tweaking/refining: This code was assigned to any minor change to the intervention that leaves all of the major intervention principles and techniques intact while making the intervention more appropriate, applicable, or acceptable (e.g., modifying language, creating slightly different versions of handouts or homework assignments, cultural adaptations).
2. Adding elements (intervention modules or activities): Additional materials or activities are inserted that are consistent with the fundamentals of the intervention (e.g., adding role play exercises to a unit on assertiveness in a substance abuse prevention intervention).
3. Removing elements (removing/skipping intervention modules or components): Particular elements of the intervention are not included (e.g., leaving out a demonstration on condom use in an HIV prevention intervention for adolescents).
4. Shortening/condensing (pacing/timing): A shorter amount of time than prescribed is used to complete the intervention or intervention sessions (e.g., shorter spacing between sessions, or shortening sessions, offering fewer sessions, or going through particular modules or concepts more quickly without skipping material).
5. Lengthening/extending (pacing/timing): A longer amount of time than prescribed by the manual/ protocol is spent to complete intervention or intervention sessions (e.g., greater spacing between sessions, longer sessions, more sessions, or spending more time on one or more modules/activities or concepts).
6. Substituting elements: A module or activity is replaced with something that is different in substance (e.g., replacing a module on condoms with one on abstinence in an HIV prevention program).
7. Reordering elements: Modules/activities or concepts are completed in a different order from what is recommended in the manual/protocol. This code would not be applied if the protocol allows flexibility in the order in which specific modules or interventions occur.
8. Integrating another approach into the intervention: The intervention of interest is used as the starting point, but aspects of different therapeutic approaches or interventions are also used (e.g., integrating an 'empty chair' exercise into a 'CBT for Depression' treatment protocol).

Appendix 10: Adapted intervention materials

Intervention manual

جسمانی ورزشوں اور نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کے ذریعے ڈپریشن

اور ذیابیطس (شوگر) کا علاج

ڈپریشن اور ذیابیطس (شوگر) میں مبتلا خواتین میں جسمانی سرگرمی کو فروغ دینے کے لئے کتابچہ

فعال ہو جاؤ!

اچھا محسوس کرو

کیا آپ چاہتے ہیں کہ آپ ڈپریشن اور شوگر کو شکست دے کر فاتح ڈپریشن اور شوگر کہلائیے۔ اگر آپ کا جواب ہاں میں ہے، تو ڈپریشن اور شوگر کی اس جنگ میں ہم آپ کے ساتھ ہیں۔ آئیے دیکھتے ہیں کہ ہم شوگر اور ڈپریشن کو کس طرح شکست دے سکتے ہیں۔ یاد رکھیے، کسی بھی کام کو سرانجام دینے میں سب سے مشکل مرحلہ پہلا قدم اٹھانا ہیں۔ اگر آپ یہ کتنا بچہ پڑھ رہے ہیں، تو مبارک ہو، آپ ڈپریشن اور شوگر کی جنگ میں اپنا پہلا قدم اٹھا چکے ہیں۔ اب ضرورت اس امر کی ہے کہ آپ اپنے معالج کی ہدایات کی روشنی میں اس طریقہ علاج کو مکمل کریں۔

اب آئیے ہم آپ کو اس طریقہ علاج کے بارے میں بتاتے ہیں۔

اس طریقہ علاج کا اہم مقصد آپ کو جسمانی ورزشوں کی ترغیب دلانا ہے۔ جسمانی ورزشیں ذہنی صحت پر مثبت اثرات مرتب کرتی ہے۔ اس کے علاوہ جسمانی ورزشیں خون میں شوگر کی سطح کو کنٹرول کرنے میں بھی کردار ادا کرتی ہیں۔ اس طرح جسمانی ورزشیں نہ صرف ڈپریشن کے علاج میں مددگار ہیں بلکہ شوگر کے علاج میں بھی مؤثر ہیں۔ تاہم، ڈپریشن اور شوگر کے مریض شاذ و نادر ہی جسمانی سرگرمیوں میں دلچسپی لیتے ہیں۔ تحقیق سے پتہ چلتا ہے کہ نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" مریضوں کو جسمانی ورزشوں میں دلچسپی لینے کے لیے استعمال کیا جاسکتا ہے۔

"بہیورل ایکٹیویشن" خوشگوار سرگرمیوں پر مرکوز ہے اور اسے ڈپریشن کے علاج کے لیے استعمال کیا جاتا ہے۔ لیکن ہم "بہیورل ایکٹیویشن" کو نہ صرف ڈپریشن کے علاج بلکہ جسمانی ورزشوں میں دلچسپی لینے کے لیے بھی استعمال کریں گے۔ اس طرح "بہیورل ایکٹیویشن" اور جسمانی ورزشوں کے دوسرے فوائد سے مستفید ہونے کا موقع مل سکے گا۔ یہ طریقہ علاج نہ صرف شوگر اور ڈپریشن کے علاج میں معاون ہے، بلکہ باقاعدگی سے جسمانی ورزشیں شروع کرنے سے دیگر جسمانی اور ذہنی صحت کے مسائل کا تدارک بھی ہو سکے گا۔

اس طریقہ علاج کا دورانیہ تقریباً چار ہفتے یعنی ایک مہینہ ہے۔ آپ نے ٹوٹل پانچ سیشن پورے کرنے ہیں۔ پہلے سیشن میں معالج آپ کو اس طرح طریقہ علاج کے بارے میں مکمل رہنمائی فراہم کرے گا۔ مزید برآں معالج آپ سے آپ کے معمولات زندگی کے بارے میں آگاہی حاصل کرے گا تاکہ آپ کے لیے علاج کا موثر پلان بنا سکے۔ پہلے سیشن کا دورانیہ 45 سے ایک گھنٹے تک ہوگا۔ پہلے سیشن کے بعد، چار ہفتے لگاتار آپ نے ہفتے میں ایک بار اپنے معالج سے ملنا ہوگا تاکہ آپ معالج کو علاج میں پیش رفت کے بارے میں آگاہ کر سکے۔ ان سیشنز کا دورانیہ 30 سے 45 منٹ تک ہوگا۔ آخری سیشن میں معالج آپ کو رہنمائی فراہم کرے گا کہ آپ کس طرح بغیر معالج کے اپنے علاج کو جاری رکھ سکتے ہیں اور کس طرح جسمانی ورزشوں کو موثر انداز میں استعمال کر سکتے ہیں۔ مزید برآں معالج آپ کو یہ رہنمائی بھی فراہم کرے گا کہ کس طرح آپ اپنی ذہنی صحت کا خود جائزہ لے سکتے ہیں اور اگر آپ کو اندازہ ہو رہا ہو کہ آپ کی ذہنی صحت اور ڈپریشن کے علامات بگڑ رہے ہو تو آپ کون سے اقدامات کریں گے۔ یاد رکھیے، علاج مکمل کرنے کے بعد بھی آپ معالج سے مشورہ کر سکتے ہیں۔

سیشن 1: معالج کے ساتھ پہلی ملاقات

پہلی ملاقات میں معالج آپ سے ڈپریشن اور شوگر کے بارے میں معلومات حاصل کرنے کے بعد آپ کو تین ورک شیٹس کے بارے میں بتایے گا۔ یہ ورک شیٹس آپ خود بھی مکمل کر سکتے ہیں یا آپ کی فراہم کردہ معلومات کی بنا پر آپ کا معالج یا خاندان کا کوئی فرد مکمل کر سکتا ہے۔

ورک شیٹ 1: آپ کا معالج آپ سے ان کاموں اور جسمانی سرگرمیاں کے بارے میں معلومات حاصل کرے گا، جو آپ پہلے کر سکتے تھے یا اب کر رہے ہیں، نمبر لیکن اب ان کو کرنے میں آپ کو دشواری محسوس ہوتی ہے۔ سب سے پہلے آپ نے کسی کام یا جسمانی سرگرمی کا تعین کرنا ہے جس کو کرنے میں آپ کو دشواری محسوس ہوتی ہو اور اس کے بعد یہ طے کرنا ہے کہ اس کام کے کرنے میں آپ کو کتنی دشواری محسوس ہوتی ہے۔ اس کے لیے آپ نے 0 سے 10 تک کسی ایک نمبر کا انتخاب کرنا ہے۔ 0 کا مطلب یہ ہے کہ آپ یہ کام بالکل نہیں کر سکتی جبکہ 10 کا مطلب یہ ہے کہ اس کام کے کرنے میں آپ کو کوئی دشواری نہیں۔ آپ کی رہنمائی کے لیے ورک شیٹ میں مختلف اشارات کے ذریعے نشاندہی کی گئی ہے کہ کون سے نمبر کا کیا مطلب ہے۔ آپ کا معالج آپ کو اس ورک شیٹ کو مکمل کرنے میں مدد کرے گا۔ آپ اپنے خاندان کے کسی فرد یا اپنے دوست کی مدد لے سکتے ہیں۔

ورک شیٹ نمبر 1

وہ کون سے ایسے کام اور جسمانی سرگرمیاں ہے جو آپ پہلے کر سکتے تھے یا اب کر رہے ہیں، لیکن اب ان کو کرنے میں آپ کو دشواری محسوس ہوتی ہے۔

آج کی تاریخ:										
کام نمبر 1:										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 2 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 3 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 4 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 5 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں

کام نمبر 6 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 7 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 8 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 9 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 10 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں

(ضرورت پڑنے پر مزید شیٹس بھی استعمال کی جا سکتی ہے)

ورک شیٹ 2: جو کام اور جسمانی سرگرمیاں آپ نے ورک شیٹ نمبر 1 میں بیان کی ہے، یا اس کے علاوہ آپ کے ذہن میں اگر کوئی اور ایسے کام اور جسمانی سرگرمیاں ہے جو آپ کو روزمرہ زندگی میں کرنا پڑتے ہیں، یا جن کے کرنے سے آپ کو خوشی محسوس ہوتی ہو، یا جن کا کرنا آپ کے لئے ضروری ہے، تو ان کاموں کی درجہ بندی آپ نے اس ورک شیٹ میں کرنی ہیں۔ اس کے لیے آپ نے معمول کی سرگرمیوں، خوشگوار سرگرمیوں اور ضروری سرگرمیوں کا تعین کرنا ہے۔ آپ کا معالج آپ کو اس ورک شیٹ کو مکمل کرنے میں مدد کرے گا۔ آپ اپنے خاندان کے کسی فرد یا اپنے دوست کی مدد لے سکتے ہیں۔

اشارے



اس کتابچہ میں معمول کی سرگرمیوں کے لیے نشان معمول کی سرگرمیاں استعمال کیا گیا ہے، جس سے پتہ چلتا ہے کہ معمول کی سرگرمیوں سے مراد وہ کام ہے جو آپ کو اپنی پوچھیں گھنٹے کی روزمرہ زندگی میں کرنے پڑتے ہیں۔



اس کتابچہ میں خوشگوار سرگرمیوں کے لیے نشان خوشگوار سرگرمیاں استعمال کیا گیا ہے، جس سے پتہ چلتا ہے کہ خوشگوار سرگرمیوں سے مراد وہ کام ہے جن کے کرنے سے آپ کو خوشی محسوس ہوتی ہو۔



اس کتابچہ میں ضروری سرگرمیوں کے لیے نشان ضروری سرگرمیاں استعمال کیا گیا ہے، جس سے پتہ چلتا ہے کہ ضروری سرگرمیوں سے مراد وہ کام ہے جن کا کرنا آپ کے لیے ضروری ہو۔

معمول کی سرگرمیاں

معمول کی سرگرمیوں سے مراد وہ کام ہے جو آپ کو اپنی پوئیس گھنٹے کی روزمرہ زندگی میں کرنے پڑتے ہیں۔ مثال کے طور پر گھر کی صفائی کرنا، کھانا پکانا، برتن دھونا، کپڑے دھونا، کپڑے استری کرنا، نماز پڑھنا۔

گھر کی صفائی کرنا



کھانا پکانا



برتن دھونا



کپڑے دھونا



کپڑے استری کرنا



نماز پڑھنا



خوشگوار سرگرمیاں

خوشگوار سرگرمیوں سے مراد وہ کام ہے جن کے کرنے سے آپ کو خوشی محسوس ہوتی ہو۔ مثال کے طور پر بچوں کے ساتھ کھیلنا، رشتے داروں اور دوستوں کے گھر جانا، شادی بیاہ اور دیگر خوشیوں کے پروگرامز میں شامل ہونا، پارک یا کھلی جگہ پر بلکی پھلکی چل قدمی کرنا، سیر و تفریح کے لیے جانا، شاپنگ کے لیے بازار جانا۔

بچوں کے ساتھ کھیلنا



رشتے داروں اور دوستوں کے گھر جانا



شادی بیاہ اور دیگر خوشیوں کے پروگرامز میں شامل ہونا



پارک یا کھلی جگہ پر بلکی پھلکی چل قدمی کرنا



سیر و تفریح کے لیے جانا



شاہنگ کے لیے بازار جانا



ضروری سرگرمیاں

ضروری سرگرمیوں سے مراد وہ کام ہے جن کا کرنا آپ کے لیے ضروری ہو۔ مثال کے طور پر مال مویشیوں کی دیکھ بھال کرنا، گھر کے مردوں کے ساتھ ان کے کاموں میں ہاتھ بٹانا، بل جمع کرنا اور بینک جانا وغیرہ، کام پر جانا اور کام سے متعلق ذمہ داریوں کو پورا کرنا، ڈاکٹر کے پاس چیک اپ کے لیے جانا، گھر کے لیے سودا سلف لانا۔

مال مویشیوں کی دیکھ بھال کرنا



گھر کے مردوں کے ساتھ ان کے کاموں میں ہاتھ بٹانا



بل جمع کرنا اور بینک جانا وغیرہ



کام پر جانا اور کام سے متعلق ذمہ داریوں کو پورا کرنا



ڈاکٹر کے پاس چیک اپ کے لیے جانا



گھر کے لیے سودا سلف لانا



ورک شیٹ نمبر 2

جو کام اور جسمانی سرگرمیاں آپ نے ورک شیٹ نمبر 1 میں بیان کی ہے، یا اس کے علاوہ آپ کے ذہن میں اگر کوئی اور ایسے کام اور جسمانی سرگرمیاں ہے جو آپ کو روزمرہ زندگی میں کرنا پڑتے ہیں، یا جن کے کرنے سے آپ کو خوشی محسوس ہوتی ہو، یا جن کا کرنا آپ کے لئے ضروری ہے، تو ان کاموں کی درجہ بندی درج ذیل ٹیبل کے مطابق کرے۔

ضروری سرگرمیاں (وہ کام، جن کا کرنا ضروری ہوتا ہے)	خوشگوار سرگرمیاں (وہ کام، جن کے کرنے سے خوشی محسوس ہوتی ہو)	معمول کی سرگرمیاں (وہ کام، جو روزمرہ زندگی میں کرنا پڑتے ہیں)
		
ضروری سرگرمیاں	خوشگوار سرگرمیاں	معمول کی سرگرمیاں

ورک شیٹ 3 : اس ورک شیٹ کو معالج کے ساتھ پہلی ملاقات میں سمجھنا انتہائی ضروری ہے کیونکہ اس طرح کا ورک شیٹ آپ نے اپنے علاج کے دوران ہر ہفتے مکمل کرنا ہے۔ معالج کے ساتھ پہلی ملاقات میں آپ نے پچھلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات مہیا کرنا ہو گی۔ ہم سمجھ سکتے ہیں کہ پچھلے ہفتے کی سرگرمیوں کی تفصیلات مہیا کرنے میں آپ کو دشواری پیش آسکتی ہے، کیونکہ آپ کو شاید پچھلے ہفتے کی جسمانی سرگرمیوں کی تفصیلات یاد نہ ہو۔ لیکن معالج کے ساتھ پہلی ملاقات میں اس ورک شیٹ کو مکمل کرنے کے دو فائدے ہیں؛ پہلا فائدہ یہ ہے کہ آپ اس ورک شیٹ کو آسانی سے سمجھ جائیں گے کیونکہ معالج کے ساتھ پہلی ملاقات میں آپ اس ورک شیٹ کو معالج کے سامنے مکمل کریں گے اور اگر آپ کو کوئی رہنمائی درکار ہو تو معالج آپ کی رہنمائی کرے گا۔ اس سے آپ کی پریکٹس بھی ہو جائے گی اور اس ورک شیٹ کو آنے والے ہفتوں میں مکمل کرنے میں آپ کے لئے مشکلات نہیں ہوں گی۔ دوسرا فائدہ یہ ہے کہ آپ کے معالج کو آپ کی موجودہ سرگرمیوں کا اندازہ ہو جائے گا، جس کی بنیاد پر معالج آپ کے علاج کے لئے موزوں پلان مرتب کرے گا۔

اگر آپ ورک شیٹ نمبر 3 کا غور سے مطالعہ کریں، تو آپ کو اندازہ ہو گا کہ یہ آپ سے آپ کے پورے ہفتے کی تفصیلات مانگ رہا ہے۔ مثلاً پیر کے دن آپ نے صبح، دوپہر اور شام کو کونسی سرگرمی سرانجام دی۔ کام کے خانے میں آپ نے لکھنا ہے کہ آپ نے کون سا کام کیا۔ نوعیت کے خانے میں آپ نے لکھنا ہے کہ اس سرگرمی کی نوعیت کیا تھی، مطلب یہ معمول کی سرگرمی تھی یا خوشگوار سرگرمی تھی یا ضروری سرگرمی تھی۔ دورانہ کے خانے میں آپ نے لکھنا ہے کہ اس سرگرمی کو کرنے میں آپ کو کتنا نائیم لگا۔

ورک شیٹ نمبر 3: پچھلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات

تجزیہ / تبصرہ	شام	دوپہر	صبح		
				کام	پیر
				نوعیت	
				دورانیہ	
				کام	منگل
				نوعیت	
				دورانیہ	
				کام	بدھ
				نوعیت	
				دورانیہ	
				کام	جمعرات
				نوعیت	
				دورانیہ	
				کام	جمعہ
				نوعیت	
				دورانیہ	

				کام	ہفتہ
				نوعیت	
				دورانیہ	
				کام	اتوار
				نوعیت	
				دورانیہ	

پچھلے ہفتے کی سرگرمیوں کی تفصیلات مہیا کرنے کے بعد معالج آپ کو ایک خالی ورک شیٹ نمبر 3 فراہم کرے گا جس میں آپ نے علاج کے پہلے ہفتے کی سرگرمیوں کی تفصیلات فراہم کرنی ہیں۔ اس ورک شیٹ میں آپ پورے ہفتے کی سرگرمیوں کو نوٹ کریں گے۔ اس ورک شیٹ کو مکمل کرنے میں آپ اپنے خاندان کے کسی فرد یا اپنے دوست کی مدد لے سکتے ہیں۔ معالج کے ساتھ دوسری ملاقات کے لئے آتے وقت آپ نے ”پہلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات“ والی ورک شیٹ نمبر 3 اپنے ساتھ لانی ہے تاکہ معالج جانچ سکے کہ معالج کے ساتھ پہلی ملاقات کے بعد آپ کی سرگرمیوں میں کوئی تبدیلی آئی ہے یا نہیں۔

ورک شیٹ نمبر 3: پہلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات

تجزیہ / تبصرہ	شام	دوپہر	صبح		
				کام	پیر
				نوعیت	
				دورانیہ	
				کام	منگل
				نوعیت	
				دورانیہ	
				کام	بدھ
				نوعیت	
				دورانیہ	
				کام	جمعرات
				نوعیت	
				دورانیہ	
				کام	جمعہ
				نوعیت	
				دورانیہ	

				کام	ہفتہ
				نوعیت	
				دورانیہ	
				کام	اتوار
				نوعیت	
				دورانیہ	

سیشن 2: معالج کے ساتھ دوسری ملاقات

معالج کے ساتھ دوسری ملاقات میں آپ نے ”پہلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات“ والی ورک شیٹ نمبر 3 اپنے ساتھ لانی ہے تاکہ معالج جانچ سکے کہ معالج کے ساتھ پہلی ملاقات کے بعد آپ کی سرگرمیوں میں کوئی تبدیلی آئی ہے یا نہیں۔ مزید برآں اس ورک شیٹ میں تعین کردہ سرگرمیوں کی بنیاد پر معالج آپ کی رہنمائی کرے گا کہ کس طرح آپ جسمانی سرگرمیوں کو بڑھا سکتے ہیں اور کونسی جسمانی سرگرمیاں آپ کی ذہنی اور جسمانی صحت کو مزید بہتر کرنے میں مدد دے سکتے ہیں۔ پہلے ہفتے کی سرگرمیوں کی تفصیلات مہیا کرنے کے بعد معالج آپ کو ایک خالی ورک شیٹ نمبر 3 فراہم کرے گا جس میں آپ نے علاج کے دوسرے ہفتے کی سرگرمیوں کی تفصیلات فراہم کرنی ہیں۔

ورک شیٹ نمبر 3: دوسرے ہفتے کے جسمانی سرگرمیوں کی تفصیلات

تجزیہ / تبصرہ	شام	دوپہر	صبح		
				کام	پیر
				نوعیت	
				دورانیہ	
				کام	منگل
				نوعیت	
				دورانیہ	
				کام	بدھ
				نوعیت	
				دورانیہ	
				کام	جمعرات
				نوعیت	
				دورانیہ	
				کام	جمعہ
				نوعیت	
				دورانیہ	

				کام	ہفتہ
				نوعیت	
				دورانیہ	
				کام	اتوار
				نوعیت	
				دورانیہ	

سلیش 3: معالج کے ساتھ تیسری ملاقات

معالج کے ساتھ تیسری ملاقات میں آپ نے "دوسرے ہفتے کے جسمانی سرگرمیوں کی تفصیلات" والی ورک شیٹ نمبر 3 اپنے ساتھ لانی ہے تاکہ معالج جانچ سکے کہ معالج کے ساتھ دوسری ملاقات کے بعد آپ کی سرگرمیوں میں کوئی تبدیلی آئی ہے یا نہیں۔ مزید برآں اس ورک شیٹ میں تعین کردہ سرگرمیوں کی بنیاد پر معالج آپ کی رہنمائی کرے گا کہ کس طرح آپ جسمانی سرگرمیوں کو بڑھا سکتے ہیں اور کونسی جسمانی سرگرمیاں آپ کی ذہنی اور جسمانی صحت کو مزید بہتر کرنے میں مدد دے سکتے ہیں۔ دوسرے ہفتے کی سرگرمیوں کی تفصیلات مہیا کرنے کے بعد معالج آپ کو ایک خالی ورک شیٹ نمبر 3 فراہم کرے گا جس میں آپ نے علاج کے تیسرے ہفتے کی سرگرمیوں کی تفصیلات فراہم کرنی ہیں۔

ورک شیٹ نمبر 3: تیسرے ہفتے کے جسمانی سرگرمیوں کی تفصیلات

تجزیہ / تبصرہ	شام	دوپہر	صبح		
				کام	پیر
				نوعیت	
				دورانیہ	
				کام	منگل
				نوعیت	
				دورانیہ	
				کام	بدھ
				نوعیت	
				دورانیہ	
				کام	جمعرات
				نوعیت	
				دورانیہ	
				کام	جمعہ
				نوعیت	
				دورانیہ	

				کام	ہفتہ
				نوعیت	
				دورانیہ	
				کام	اتوار
				نوعیت	
				دورانیہ	

سلیشن 4: معالج کے ساتھ چوتھی ملاقات

معالج کے ساتھ چوتھی ملاقات میں آپ نے "تیسرے ہفتے کے جسمانی سرگرمیوں کی تفصیلات" والی ورک شیٹ نمبر 3 اپنے ساتھ لائی ہے تاکہ معالج جانچ سکے کہ معالج کے ساتھ تیسری ملاقات کے بعد آپ کی سرگرمیوں میں کوئی تبدیلی آئی ہے یا نہیں۔ مزید برآں اس ورک شیٹ میں تعین کردہ سرگرمیوں کی بنیاد پر معالج آپ کی رہنمائی کرے گا کہ کس طرح آپ جسمانی سرگرمیوں کو بڑھا سکتے ہیں اور کونسی جسمانی سرگرمیاں آپ کی ذہنی اور جسمانی صحت کو مزید بہتر کرنے میں مدد دے سکتے ہیں۔ تیسرے ہفتے کی سرگرمیوں کی تفصیلات مہیا کرنے کے بعد معالج آپ کو ایک خالی ورک شیٹ نمبر 3 فراہم کرے گا جس میں آپ نے علاج کے چوتھے ہفتے کی سرگرمیوں کی تفصیلات فراہم کرنی ہیں۔

ورک شیٹ نمبر 3: چوتھے ہفتے کے جسمانی سرگرمیوں کی تفصیلات

تجزیہ / تبصرہ	شام	دوپہر	صبح		
				کام	پیر
				نو عیت	
				دورانیہ	
				کام	منگل
				نو عیت	
				دورانیہ	
				کام	بدھ
				نو عیت	
				دورانیہ	
				کام	جمعرات
				نو عیت	
				دورانیہ	
				کام	جمعہ
				نو عیت	

				دورانيه	
				كام	هفته
				نوعيت	
				دورانيه	
				كام	اتوار
				نوعيت	
				دورانيه	

سیشن 5: معالج کے ساتھ پانچویں اور آخری ملاقات

معالج کے ساتھ پانچویں اور آخری ملاقات میں آپ نے "پوتھے ہفتے کے جسمانی سرگرمیوں کی تفصیلات" والی ورک شیٹ نمبر 3 اپنے ساتھ لانی ہے تاکہ معالج جانچ سکے کہ معالج کے ساتھ پوتھی ملاقات کے بعد آپ کی سرگرمیوں میں کوئی تبدیلی آئی ہے یا نہیں۔ مزید برآں اس ورک شیٹ میں تعین کردہ سرگرمیوں کی بنیاد پر معالج آپ کی رہنمائی کرے گا کہ کس طرح آپ جسمانی سرگرمیوں کو بڑھا سکتے ہیں اور کونسی جسمانی سرگرمیاں آپ کی ذہنی اور جسمانی صحت کو مزید بہتر کرنے میں مدد دے سکتے ہیں۔ چونکہ اس علاج کے بارے میں آج معالج کے ساتھ آپ کی آخری ملاقات ہوگی، تو آپ کا معالج آپ سے ورک شیٹ نمبر 1 دوبارہ مکمل کروائے گا تاکہ ہم جان سکے کہ علاج کے آغاز میں میں آپ کو جن کاموں اور جسمانی سرگرمیوں میں دشواری محسوس ہوتی تھی، کیا علاج کے بعد ان میں کوئی بہتری آئی ہے۔

اس ملاقات میں معالج آپ کو ورک شیٹ نمبر 4 کے بارے میں رہنمائی فراہم کرے گا، جس کا مقصد یہ ہے کہ کس طرح آپ اپنی ذہنی صحت کا خود جائزہ لے سکتے ہیں اور اگر آپ کو اندازہ ہو رہا ہو کہ آپ کی ذہنی صحت اور ڈپریشن کے علامات بگڑ رہے ہو تو آپ کون سے اقدامات کریں گے۔ ہمیں قوی امید ہے کہ اس طریقہ علاج کو مکمل کرنے کے بعد آپ کی ذہنی صحت کافی حد تک بہتر ہو جائیے گی اور اسی لئے آپ کا معالج آپ کو یہ طریقہ علاج بغیر کسی کے رہنمائی کے جاری رکھنے کے طریقے سکھائیں گے تاکہ آپ کی ذہنی اور جسمانی صحت مزید بہتر ہو سکے۔ لیکن اس بات کا بھی امکان ہے کہ علاج مکمل ہونے کے کچھ عرصہ بعد آپ کو دوبارہ ذہنی صحت کے مسائل اور ڈپریشن کے علامات ظاہر ہو سکتے ہیں۔ اس بات کو مد نظر رکھتے ہوئے آپ کے معالج آپ کو ورک شیٹ نمبر 4 کے ذریعے سکھائیں گے کہ آپ کس طرح آپ اپنی ذہنی صحت کا خود جائزہ لے سکتے ہیں اور اگر آپ کو ذہنی تناؤ یا ڈپریشن کے علامات دوبارہ ظاہر ہو رہے ہو تو آپ کس طرح جسمانی سرگرمیوں کے ذریعے اس کا بر وقت تدارک کر سکتے ہیں۔ یاد رکھیے، علاج مکمل کرنے کے بعد بھی آپ معالج سے مشورہ کر سکتے ہیں۔

ورک شیٹ نمبر 1

آپ نے علاج کے آغاز میں جن کاموں اور جسمانی سرگرمیوں کی نشاندہی کی تھی جن کے کرنے میں آپ کو دشواری محسوس ہوتی تھی، ان کاموں اور جسمانی سرگرمیوں کو دوبارہ لکھیں اور بتائیں کہ اب علاج کے بعد ان کے کرنے میں آپ کو کتنی دشواری محسوس ہوتی ہے۔

آج کی تاریخ:										
کام نمبر 1:										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 2 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 3 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 4 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 5 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں

کام نمبر 6 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر	کوئی دشواری نہیں	
کام نمبر 7 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر	کوئی دشواری نہیں	
کام نمبر 8 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر	کوئی دشواری نہیں	
کام نمبر 9 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر	کوئی دشواری نہیں	
کام نمبر 10 :										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر	کوئی دشواری نہیں	

(ضرورت پڑنے پر مزید شیٹس بھی استعمال کی جا سکتی ہے)

ورک شیٹ نمبر 4

دوبارہ ذہنی تناؤ یا ڈپریشن کے علامات کا ظاہر ہونا اور جسمانی سرگرمیوں کے ذریعے اس کا بروقت تدارک

پچھلی بار جب مجھے ذہنی تناؤ تھا تو میں نے مندرجہ ذیل چیزیں مختلف طریقے سے کی یا انہیں مکمل طور پر کرنا چھوڑ دیا۔

پچھلی بار جب مجھے ذہنی تناؤ تھا تو میرے دماغ میں مندرجہ ذیل خیالات گردش کر رہے تھے۔

پچھلی بار جب مجھے ذہنی تناؤ تھا تو میں نے مندرجہ ذیل جسمانی علامات محسوس کی۔

پچھلی بار جب مجھے ذہنی تناؤ تھا، مندرجہ ذیل جسمانی سرگرمیاں کرنے سے واقعی مدد ملی۔

Case study

صبا کی کہانی، اُن کی زبانی

صبا ایک سکول ٹیچر ہیں، جن کی عمر تقریباً 58 سال ہے۔ صبا نے ایجوکیشن میں ماسٹر کیا ہے اور اپنے گاؤں کے سکول میں پڑھاتی ہے۔ صبا کے چار بچے ہیں جن کی شادیاں ہو چکی ہیں۔ صبا ایک مڈل کلاس فیملی سے تعلق رکھتی ہے، اور اپنے شوہر اور بچوں کے ساتھ ایک گھر میں رہتی ہے۔

صبا کو 2010 میں دل کا دورہ پڑا، اور اس وقت سے بلڈ پریشر کا علاج کر رہی ہے۔ 2015 میں صبا کو شوگر کی علامات ظاہر ہونا شروع ہوئی اور ڈاکٹر سے معائنہ کرنے کے بعد صبا کو پتہ چلا کہ اسے شوگر (ڈیابیطس) کا مرض لاحق ہو گیا ہے۔ شوگر اور بلڈ پریشر کی تشخیص ہونے کے باوجود صبا اپنے معمولات زندگی اچھے طریقے سے ادا کر رہی تھی۔ لیکن تقریباً تین سال پہلے صبا نے اپنے معمولات زندگی میں تبدیلی محسوس کرنا شروع کیا۔ پہلے صبا کا خیال تھا کہ یہ عمر کے ساتھ ہونے والی معمول کی تبدیلی ہے۔ لیکن وقت گزرنے کے ساتھ یہ تبدیلیاں اور بھی نمایاں ہونا شروع ہوئی، حتیٰ کہ صبا کے خاندان کے افراد کے علاوہ صبا کے ساتھ عام میل جول رکھنے والے افراد کو بھی صبا کی صورتحال کا اندازہ ہو گیا۔

خاندان والوں اور چاہنے والوں کے کہنے کے باوجود بھی صبا نے اس کی طرف توجہ نہیں دی لیکن تقریباً دو ماہ پہلے اچانک صبا نے دنیا سے اپنے آپ کو الگ کرنا شروع کر دیا۔ اب صبا کو ان کاموں میں خوشی محسوس نہیں ہوتی، جن کے کرنے سے پہلے صبا کو خوشی محسوس ہوتی تھی۔ اس کا اثر صبا کی معمولات زندگی پر بھی ہوا کیونکہ صبا اب اپنے کاموں پر توجہ نہیں دے سکتی ہے۔ صبا نے سکول جانا چھوڑ دیا ہے اور وہ زیادہ تر ٹائم گھر پر ہی گزارتی ہے۔ روز مرہ زندگی کے کام مثلاً تلاوت کرنا، عبادت کرنا اور گھر کے کام کاج کرنے میں بھی صبا کو مشکلات درپیش ہے۔ صبا نے اپنے علاج معالجہ پر بھی توجہ دینا چھوڑ دیا ہے اور اب صبا باقاعدگی سے ادویات بھی نہیں لیتی، جس کی وجہ سے ان کے شوگر اور بلڈ پریشر کے ساتھ منسلک مسائل بھی بڑھنا شروع ہو گئے ہیں۔

صبا کے شوہر اور اس کے بیٹوں نے صبا کو آمادہ کیا کہ اسے کسی ماہر نفسیات کے ساتھ مشورہ کرنا چاہیے۔ اس کے بعد کیا ہوا، صبا کی زبانی سنئے۔

سیشن 1: صبا کا معالج کے ساتھ پہلی ملاقات

یہ ایک خوشگوار دن تھا، اور سورج آب و تاب کے ساتھ نکلا ہوا تھا۔ بہت دن بعد سورج کی کرنیں مجھ پر پڑی، تو میرے جسم میں جیسے جان آگئی ہو۔ میرا دل کر رہا تھا کہ میں بہت دیر تک دھوپ میں کھڑی رہوں لیکن یکدم میرے کانوں میں بیٹے کی آواز آئی اور کہا، امی جلدی کیجیے ہم پیلے ہی سے لیٹ ہو رہے ہیں۔ بیٹے اور شوہر کی گفتگو سے مجھے اندازہ ہوا کہ وہ مجھے ڈاکٹر کے پاس لے کر جا رہے ہیں۔ میں بو جھل قدموں سے گاڑی کی طرف آگے بڑھیں۔ مجھے اس بات کا ڈر تھا کہ آج ڈاکٹر مجھے پانچ جھے قسم کی مزید دوائیاں تجویز کریں گا۔ میں پیلے سے آٹھ دس قسم کی گولیاں کھا رہی ہو اور میں ان سے تنگ آگئی ہو۔ مجھے لگ رہا تھا کہ یہ دوائیاں میرے لئے عذاب بن گئی ہے کیونکہ صبح و شام مجھے دس پندرہ قسم کی دوائیاں کھانا پڑتی۔ میں یہی سوچ رہی تھی کہ میرے بیٹے نے آواز دی کہ ہم پہنچ گئے ہیں اور اس نے گاڑی روک دی۔

ہسپتال میں کچھ دیر انتظار کرنے کے بعد میری باری آئی، اور میں باری قدموں سے ڈاکٹر کے کمرے کی طرف لپکی۔ جیسے ہی میں نے کمرے کا دروازہ کھولا تو ایک چپیس یا تیس سال کی ڈاکٹر صاحبہ بیٹھی ہوئی تھی۔ ڈاکٹر صاحبہ نے مسکراتے ہوئے میری طرف دیکھا اور کہا اماں جی، آئیے بیٹھے۔ اس کے بعد ڈاکٹر صاحبہ نے مجھ سے کچھ سوالات پوچھیں اور میرے جوابات کو اپنے ساتھ کاغذ پر لکھتی گئیں۔ پانچ دس منٹ کے پوچھ گچھ کے بعد ڈاکٹر صاحبہ نے مجھے بتایا کہ کوئی پریشانی کی بات نہیں ہے، بس آپ کو ذہنی تناؤ یعنی ڈیپریشن ہے، جس کا علاج موجود ہے اور علاج کے بعد آپ بالکل ٹھیک ٹھاک ہو جائیں گی۔ میں نے ڈاکٹر صاحبہ کو صاف صاف بتا دیا کہ میں مزید گولیاں یا ادویات نہیں لے سکتی کیونکہ میں پیلے ہی سے بہت ادویات لے رہی ہوں۔ ڈاکٹر صاحبہ نے مسکراتے ہوئے جواب دیا، اماں جی فکر نہ کیجیے، ہم آپ کے نفسیاتی مسائل کا حل بغیر ادویات اور گولیوں کے کریں گے۔

ڈاکٹر صاحبہ مجھے ایک دوسرے کمرے میں لے کر گئی۔ یہ انتہائی خاموش اور پرسکون کمرہ تھا۔ ڈاکٹر صاحبہ نے مجھے بتایا کہ اگر آپ اپنے معمولات زندگی دوبارہ سے شروع کر دے اور ساتھ میں کچھ جسمانی سرگرمیاں شروع کر دیں تو اس سے آپ کا ذہنی تناؤ کم ہو سکتا ہے اور اس طرح آپ کا علاج بغیر ادویات کے ممکن ہے۔ میں نے ڈاکٹر صاحبہ کو بتایا کہ ہزار بار کوشش کرنے کے باوجود نہ تو مجھے جسمانی سرگرمیوں میں دلچسپی ہے اور نہ ہی میں اپنے پرانے معمولات زندگی کی طرف آسکتی ہوں۔ میں چاہتی ہوں کہ میں پھر سے اپنی سکول ڈیوٹی شروع کروں اور اپنے گھر کے روزمرہ کے کام کروں، لیکن یہ میرے بس کی بات نہیں ہے۔ آج کل میرا زیادہ تر ناظم کمرے ہی میں گزارتا ہے کیونکہ میرا کسی چیز میں دل نہیں لگتا۔

یہی موقع تھا کہ ڈاکٹر صاحبہ نے مجھے نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کا تعارف کروایا۔ ڈاکٹر صاحبہ نے بتایا کہ یہ ایک ایسا طریقہ علاج ہے جس کے ذریعے میں اپنے معمولات زندگی کی طرف دوبارہ آسکتی ہوں، اور یہ مجھے جسمانی سرگرمیاں کرنے میں بھی مدد دے گی۔ ڈاکٹر صاحبہ نے مزید بتایا کہ روزمرہ زندگی کے کام اور جسمانی سرگرمیوں سے نہ صرف میرا ذہنی تناؤ کم ہوگا بلکہ یہ شوگر اور بلڈ پریشر کو کنٹرول کرنے میں بھی مددگار ثابت ہوگا۔ ڈاکٹر صاحبہ نے مجھ سے اجازت لینے کے بعد نفسیاتی طریقہ علاج "بہیورل ایکٹیویشن" کا آغاز کیا۔ ڈاکٹر صاحبہ نے مجھ سے میرے پچھلے معمولات زندگی کے بارے میں سوالات کیے اور مجھ سے پوچھا کہ وہ کون سے ایسے کام ہے جو میں پیلے کر سکتی تھی یا اب کر رہی ہوں، لیکن اب ان کو کرنے میں مجھے دشواری محسوس ہوتی ہے۔ اس کے بعد ڈاکٹر صاحبہ نے مجھ سے ان جسمانی سرگرمیوں کے بارے میں پوچھا، جو یا تو مجھے روزمرہ زندگی میں کرنا پڑتے ہیں، یا جن کے کرنے سے مجھے خوشی محسوس ہوتی ہو، یا جن کا کرنا میرا لئے ضروری ہے۔ ڈاکٹر صاحبہ نے یہ سب کچھ ایک کتاچے میں اپنے ساتھ نوٹ کیا، اور مجھے دکھایا کہ کس طرح انہوں نے مجھ سے لی گئی معلومات کو ورک شیٹ نمبر 1 اور 2 میں محفوظ کیا۔ ڈاکٹر صاحبہ نے مجھے بتایا کہ یہ آپ کی ڈائری ہے اور اس کتاچے کے اوپر ڈاکٹر صاحبہ نے لکھا، "صبا کی ڈائری"۔

ورک شیٹ نمبر 1: معالج کے ساتھ پہلی ملاقات

وہ کون سے ایسے کام اور جسمانی سرگرمیاں ہے جو آپ پہلے کر سکتے تھے یا اب کر رہے ہیں، لیکن اب ان کو کرنے میں آپ کو دشواری محسوس ہوتی ہے۔

آج کی تاریخ:										
کام نمبر 1: سکول جانا اور وہاں پر ڈیوٹی سرانجام دینا										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 2: گھر کے کام کاج کرنا										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 3: بچوں اور شوہر کے ساتھ ان کے کاموں میں مدد کرنا اور ان کے ساتھ کھیلنا وغیرہ										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 4: غم اور خوشی کے مواقع پر رشتے داروں اور دوستوں کے گھر جانا وغیرہ										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 5: گھر کے لیے سودا سلف لانا، بل جمع کرنا وغیرہ										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں

(ضرورت پڑنے پر مزید شیٹس بھی استعمال کی جا سکتی ہے)

ورک شیٹ نمبر 2

جو کام اور جسمانی سرگرمیاں آپ نے ورک شیٹ نمبر 1 میں بیان کی ہے، یا اس کے علاوہ آپ کے ذہن میں اگر کوئی اور ایسے کام اور جسمانی سرگرمیاں ہے جو آپ کو روزمرہ زندگی میں کرنا پڑتے ہیں، یا جن کے کرنے سے آپ کو خوشی محسوس ہوتی ہو، یا جن کا کرنا آپ کے لئے ضروری ہے، تو ان کاموں کی درجہ بندی درج ذیل ٹیبل کے مطابق کرے۔

معمول کی سرگرمیاں (وہ کام، جو روزمرہ زندگی میں کرنا پڑتے ہیں)	خوشگوار سرگرمیاں (وہ کام، جن کے کرنے سے خوشی محسوس ہوتی ہو)	ضروری سرگرمیاں (وہ کام، جن کا کرنا ضروری ہوتا ہے)
 معمول کی سرگرمیاں	 خوشگوار سرگرمیاں	 ضروری سرگرمیاں
گھر کی صفائی کرنا	بچوں کے ساتھ کھیلنا	سکول جانا اور وہاں پر ڈیوٹی سرانجام دینا
کھانا پکانا	رشتے داروں اور دوستوں کے گھر جانا	شوہر کے ساتھ ان کے کاموں میں ہاتھ بٹانا
برتن دھونا	شادی بیاہ پروگرامز میں شامل ہونا	بل جمع کرنا اور بینک جانا وغیرہ
کپڑے دھونا	کھلی جگہ پر ہلکی پھلکی چھل قدمی کرنا	ڈاکٹر کے پاس چیک اپ کے لیے جانا
کپڑے استری کرنا	سیر و تفریح کے لیے جانا	گھر کے لیے سودا سلف لانا
نماز پڑھنا	شاپنگ کے لیے بازار جانا	گھر میں موجود مرغیوں و غیرہ کا خیال رکھنا

ورک شیٹ نمبر 1 اور 2 مکمل کرنے کے بعد ڈاکٹر صاحبہ نے مجھے ایک اور ورک شیٹ بھرنے کے لئے کہا۔ ڈاکٹر صاحبہ نے مجھے بتایا کہ اس ورک شیٹ میں پچھلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات لکھنی ہیں۔ ڈاکٹر صاحبہ نے مزید بتایا کہ اس طرح کا ورک شیٹ آپ نے ہر ہفتہ مکمل کرنا ہے اور ان ورک شیٹس کے بھرنے میں آپ کے خاندان کے افراد یا آپ کے دوست و احباب آپ کی مدد کر سکتے ہیں۔

ڈاکٹر صاحبہ نے ”پچھلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات“ کے ورک شیٹ کے بارے میں بتایا کہ اس کی مدد سے ہم صرف آپ کے پچھلے ہفتے کے جسمانی سرگرمیوں کا اندازہ لگانا چاہتے ہیں۔ مزید برآں اس ورک شیٹ کو مکمل کرنے سے آپ کی پریکٹس بھی ہو جائے گی، اور آپ کو آئندہ ہفتوں کی ورک شیٹس مکمل کرنے میں آسانی ہوگی۔ ہمیں اس بات کا احساس ہے کہ شاید آپ کو کچھ سرگرمیاں یاد نہ ہو یا ان کی تفصیلات یاد نہ ہو لیکن پھر بھی جہاں تک ممکن ہو، آپ اس ورک شیٹ کو مکمل کریں۔

ورک شیٹ نمبر 3: پچھلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات

تجزیہ / تبصرہ	شام	دوپہر	صبح		
				کام	پیر
				نوعیت	
				دورانیہ	
				کام	منگل
				نوعیت	
				دورانیہ	
				کام	بدھ
				نوعیت	
				دورانیہ	
				کام	جمعرات
				نوعیت	
				دورانیہ	
				کام	جمعہ
				نوعیت	
				دورانیہ	

				کام	ہفتہ
				نوعیت	
				دورانیہ	
				کام	اتوار
				نوعیت	
				دورانیہ	

”پچھلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات“ کے ورک شیٹ کو مکمل کرنے کے بعد ڈاکٹر صاحبہ نے اس ورک شیٹ کا بغور تجزیہ کیا۔ ڈاکٹر صاحبہ نے ان سرگرمیوں کی نشاندہی میں میری مدد کی، جو میرے جسمانی سرگرمیوں کو فروغ دے سکتی تھی اور میرا ذہنی تناؤ اور دیگر جسمانی اور ذہنی مسائل کو حل میں کرنے میں مددگار ثابت ہو سکتی تھی۔ ڈاکٹر صاحبہ نے ان سرگرمیوں کی بھی نشاندہی کی، جو مجھ پر منفی اثرات مرتب کر سکتی تھی۔

ڈاکٹر صاحبہ نے مجھے سمجھایا کہ مجھے ان کاموں کو زیادہ سے زیادہ کرنا ہے، جو میرے لئے فائدہ مند ہیں اور ان سرگرمیوں کو ترک کرنا ہے، جو میرے صحت کے لئے نقصان دہ ثابت ہو سکتے ہیں۔ ڈاکٹر صاحبہ نے مجھے یہ بھی سمجھایا کہ کس طرح میں نے ”پہلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات“ کی ورک شیٹ کو مکمل کرنا ہے۔ ڈاکٹر صاحبہ نے مجھے بتایا کہ میں نے کم از کم چار ہفتے متواتر سیشن کے لئے آنا ہے۔ اس کے بعد ڈاکٹر صاحبہ سے میں نے اجازت لی اور میں ہسپتال سے گھر چلی گئی۔

ورک شیٹ نمبر 3: پہلے ہفتے کے جسمانی سرگرمیوں کی تفصیلات

تجزیہ / تبصرہ	شام	دوپہر	صبح		
				کام	پیر
				نوعیت	
				دورانیہ	
				کام	منگل
				نوعیت	
				دورانیہ	
				کام	بدھ
				نوعیت	
				دورانیہ	
				کام	جمعرات
				نوعیت	
				دورانیہ	
				کام	جمعہ
				نوعیت	

				دورانيه	
				ڪام	هفته
				نوعيت	
				دورانيه	
				ڪام	اتوار
				نوعيت	
				دورانيه	

سیشن 2: صبا کا معالج کے ساتھ دوسری ملاقات

ورک شیٹ نمبر 3: دوسرے ہفتے کے جسمانی سرگرمیوں کی تفصیلات

تجزیہ / تبصرہ	شام	دوپہر	صبح		
				کام	پیر
				نو عیت	
				دورانیہ	
				کام	منگل
				نو عیت	
				دورانیہ	
				کام	بدھ
				نو عیت	
				دورانیہ	
				کام	جمعرات
				نو عیت	
				دورانیہ	
				کام	جمعہ
				نو عیت	

				دورانيه	
				كام	هفته
				نوعيت	
				دورانيه	
				كام	اتوار
				نوعيت	
				دورانيه	

سیشن 3: صبا کا معالج کے ساتھ تیسری ملاقات

ورک شیٹ نمبر 3: تیسرے ہفتے کے جسمانی سرگرمیوں کی تفصیلات

تجزیہ / تبصرہ	شام	دوپہر	صبح		
				کام	پیر
				نوعیت	
				دورانیہ	
				کام	منگل
				نوعیت	
				دورانیہ	
				کام	بدھ
				نوعیت	
				دورانیہ	
				کام	جمعرات
				نوعیت	
				دورانیہ	
				کام	جمعہ
				نوعیت	

				دورانيه	
				ڪام	هفته
				نوعيت	
				دورانيه	
				ڪام	اتوار
				نوعيت	
				دورانيه	

سیشن 4: صبا کا معالج کے ساتھ چوتھی ملاقات

ورک شیٹ نمبر 3: چوتھے ہفتے کے جسمانی سرگرمیوں کی تفصیلات

تجزیہ / تبصرہ	شام	دوپہر	صبح		
				کام	پیر
				نوعیت	
				دورانیہ	
				کام	منگل
				نوعیت	
				دورانیہ	
				کام	بدھ
				نوعیت	
				دورانیہ	
				کام	جمعرات
				نوعیت	
				دورانیہ	
				کام	جمعہ

				نوعیت	
				دورانیہ	
				کام	ہفتہ
				نوعیت	
				دورانیہ	
				کام	اتوار
				نوعیت	
				دورانیہ	

سیشن 5: صبا کا معالج کے ساتھ پانچویں اور آخری ملاقات

ورک شیٹ نمبر 1

آپ نے علاج کے آغاز میں جن کاموں اور جسمانی سرگرمیوں کی نشاندہی کی تھی جن کے کرنے میں آپ کو دشواری محسوس ہوتی تھی، ان کاموں اور جسمانی سرگرمیوں کو دوبارہ لکھے اور بتائیں کہ اب علاج کے بعد ان کے کرنے میں آپ کو کتنی دشواری محسوس ہوتی ہے۔

آج کی تاریخ:										
کام نمبر 1: سکول جانا اور وہاں پر ڈیوٹی سرانجام دینا										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 2: گھر کے کام کاج کرنا										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 3: بچوں اور شوہر کے ساتھ ان کے کاموں میں مدد کرنا اور ان کے ساتھ کھیلنا وغیرہ										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 4: غم اور خوشی کے مواقع پر رشتے داروں اور دوستوں کے گھر جانا وغیرہ										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں
کام نمبر 5: گھر کے لیے سودا سلف لانا، بل جمع کرنا وغیرہ										
آج کل میں یہ کام کر سکتی ہوں (نمبر کے گرد دائرہ لگائیں)										
0	1	2	3	4	5	6	7	8	9	10
بلکل نہیں		بسا اوقات		کبھی کبھار		بیشتر اوقات		اکثر		کوئی دشواری نہیں

ورک شیٹ نمبر 4

دوبارہ ذہنی تناؤ یا ڈپریشن کے علامات کا ظاہر ہونا اور جسمانی سرگرمیوں کے ذریعے اس کا بروقت تدارک

پچھلی بار جب مجھے ذہنی تناؤ تھا تو میں نے مندرجہ ذیل چیزیں مختلف طریقے سے کی یا انہیں مکمل طور پر کرنا چھوڑ دیا۔

پچھلی بار جب مجھے ذہنی تناؤ تھا تو میرے دماغ میں مندرجہ ذیل خیالات گردش کر رہے تھے۔

پچھلی بار جب مجھے ذہنی تناؤ تھا تو میں نے مندرجہ ذیل جسمانی علامات محسوس کی۔

پچھلی بار جب مجھے ذہنی تناؤ تھا، مندرجہ ذیل جسمانی سرگرمیاں کرنے سے واقعی مدد ملی۔

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