

TITLE

Behaviour change practices in exercise referral practitioners: A realist evaluation of implementation

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Behaviour change practices in exercise referral practitioners: A realist evaluation of implementation

John Downey

A thesis submitted in fulfilment of the requirements of St Mary's University for the degree of Doctor of Philosophy

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Abstract

Physical activity can prevent and treat multiple diseases. Exercise referral schemes have been used extensively as one healthcare pathway. Schemes typically involve the referral of an inactive individual, with a long term condition, for a time limited exercise programme. Evidence has shown limited benefit, yet the exploration of implementation is under researched. National guidance, in the United Kingdom, recommends that exercise referral schemes should not be commissioned unless behaviour change practices are implemented. Nonetheless, novel evaluations, which are sensitive to the complex nature of behaviour change implementation, have not been undertaken. Therefore, this research sought to answer how, why, and in which circumstances behaviour change practices are implemented by exercise referral practitioners.

Realist evaluation, a form of theory driven evaluation, was adopted to address the research question. Programme theory, the envisaged causal workings of implementation, was developed and tested to advance knowledge on how behaviour change practice can be achieved by exercise referral practitioners. An 8-month focused ethnography was used to develop programme theory. Subsequently, a survey was validated to empirically test programme theory. Adjudication between theory required an assessment of the fidelity to behaviour change practices. Therefore, vignettes were created and validated, which acted as a proxy to observations. The survey was then completed through online, and facilitated interviews, using a 'think aloud' methodology.

The analysis showed that practice frameworks augment motivation when there is congruent practitioner characteristics and practice monitoring is utilised, whereas frameworks improve capability when faced with challenging attendees. Supportive leadership improves motivation when there is an organisational commitment to behaviour change and practitioners are passionate to empower attendees. Supportive leadership improves capability for implementation when a learning climate is created. Partnerships with medical professionals enhance implementation, through changes to motivation, when medical professionals commit and recognise the value of schemes, and partnerships enhance capability where medical professionals reinforce practice via congruent communication. On-going support enhances capability where practitioners are cognizant of their role and have lower behaviour change competencies, conversely, motivation is enhanced as practitioners become more capable.

Exercise referral schemes risk being labelled ineffective without considering the implementation climate and fidelity to best practice guidance. This thesis provides portable and actionable findings, which could lead to a greater translation of behaviour change practices to applied settings in exercise referral and in other medically led community based self-management interventions.

Declaration

I declare that the work in this thesis is original except where indicated by citations in the text. I confirm that work has not been presented as part of another academic award to this University or any other education institution.

John Downey

A handwritten signature in black ink, appearing to read "John Downey". The signature is written in a cursive style with a large initial 'J' and a distinct 'D'.

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Relevant Publications During this Thesis

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Downey, J., Feddersen, N., & McDougall, M., (2023). Getting to know your organisation and its culture, in Borrie, A., Miles, A., Watson, P., Chandler, C., & Hooten, A. *The applied sport and exercise practitioner: Insights into becoming an effective practitioner in sport and exercise disciplines*. Routledge.

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Abbreviations

BCTs	Behaviour change techniques
BCTTv1	Behaviour change technique taxonomy
BECCI	The behaviour change counselling index
CFIR	Consolidated framework for implementation research
CMO	Content mechanism outcome
COM-B	Capability, opportunity, motivation- behaviour
DOH	Department of health
ERS	Exercise referral scheme
GP	General practitioner
LCTs	Long-term Conditions
MI	Motivational interviewing
NCDs	Non-communicable diseases
NICE	National Institute for Health and Care Excellence
PA	Physical activity
PCC	Person Centred Care
TDF	Theoretical domains framework
UK	United Kingdom
WHO	World Health Organization

Chapter 1: Introduction

1.1 Chapter Overview

This chapter provides the background to the forthcoming systematic programme of research which aimed to understand how, why, and in which circumstances, exercise referral practitioners implement behaviour change practices. First, a critical overview of Non-Communicable Disease (NCD) is presented. The dominant discourse is outlined, and challenged, framing the forthcoming body of research. The call for increasing Physical Activity (PA), as an important behaviour for health and wellbeing, is then introduced. Subsequently, the history of Exercise Referral Schemes (ERSs), and the application of behavioural science, as one potential intervention, is explored. To conclude, the role of implementation research is presented as a vital element of contemporary research in this area, providing a prelude to the aims and objectives of this systematic programme of research.

1.2 Burden of Non-Communicable Disease/ Long Term Conditions

Non-communicable diseases are illnesses that are not acquired through transmission. The dominant NCDs are chronic, progressive, require daily management and are a result of a genetic predisposition interacting with individual and environmental factors (World Health Organization [WHO], 2013). The four prominent NCDs, that lead to premature preventable mortality are, cancer, diabetes, cardiovascular disease, and respiratory disease (WHO, 2020). There is overlap in the terms NCDs and Long-Term Conditions (LTCs), and they are often used interchangeably (Adjaye-Gbewonyo & Vaughan, 2019). Yet, the term LTCs also captures interrelated health issues that are not defined as NCDs, which are sometimes known as hidden NCDs (Pearce et al., 2015). The term LTCs provides a more appropriate lexicon for health issues of this nature and will be adopted within this thesis, as illustrated below.

The term NCD privilege's a biomedical model of health and conflates the causes and treatments of LTCs (Pearce et al., 2015). Moreover, the topic of this thesis focuses on the implementation of behaviour change practices and optimal behaviour change practice requires an awareness of the wider determinants of behaviour (National Institute for Health and Care Excellence [NICE], 2014). Assuming lifestyle behaviours are under complete volition places blame on the individual, ignoring the structural drivers of health behaviours. The risk taking behaviours associated with LTCs are

arguably communicable as they are passed across generations and cluster in low socioeconomic groups (Ackland et al., 2003; Adjaye-Gbewonyo & Vaughan, 2019). Lastly, the philosophical orientation of the thesis assumes outcomes occur contingent on the wider context. A reductionist view of health violates the paradigm assumptions of the thesis (see Chapter 3).

The dominant biomedical and health economic perspective positions health as quantifiable, modifiable, and possessing a discrete monetary value, conflating the complexities of health and human behaviour (Heino et al., 2021; Sniehotta et al., 2017). Typical practice, in research and policy, usually illustrates the increasing prevalence of LTCs and the threat to global mortality and economy as a starting point. Long term conditions are responsible for approximately 70% of global deaths, on an annual basis (Bennett et al., 2018; Vos et al., 2020). Long term conditions are also postulated to cost the United States of America alone \$94.9 trillion by 2050 (Chen et al., 2018). Subsequently, the economic viewpoint has generated increasing commitment from global agencies and policy makers (Allen et al., 2021). Noteworthy events include the WHO's first Global Status Report on Non-Communicable Diseases which unanimously outlined the burden of LTCs (WHO, 2011). In 2013, the Global Action Plan for the Prevention and Control of Non-Communicable Diseases provided 193 member states with a menu of policy options, to alleviate the strain of LTCs on society (WHO, 2013). In 2015, a collective target was agreed by member states to reduce avoidable deaths by 30% by 2030 within the Sustainable Development Goals (UN General Assembly, 2015). Subsequent policy guidance has been published in response to calls for more recommendations and the need to progress policy implementation, investment, and recognition (Allen et al. 2021; WHO, 2018; 2020).

Although, global statements of intent are fundamental to energise efforts in tackling LTCs, the economic perspective has notable limitations. Viewing LTCs through a biomedical lens leads to inappropriate recommendations that promote standardised approaches, unrealistic and vague goals, underemphasises the wider drivers of LTCs, underappreciates the role of health inequalities, and prioritises preventable deaths over other measures of wellbeing (Pearce et al., 2015). In addition, the processes involved in approximating the burden of LTCs, and making decisions about resource allocations, through an economic lens are not without challenges. Assumptions about the benefits of specific health provisions are made by using indicators like cost

effectiveness thresholds and quality of life metrics. Some of the assumptions that underpin typical health economics are flawed, as they assume health is the same as the consumption of other goods, yet alternative practices are '*seldom entertained*' (Kelly, 2019, p.167). Decisions about health are more complex as individuals may not have complete knowledge about the factors associated with health outcomes and do not engage with health behaviours due to rational choice alone (Kelly & Barker, 2016; Turner et al., 2021). There is also an assumption that the conceptualisation of good health will be the same for everyone, which ignores individual values and goals. Moreover, many of the assumptions discriminate between groups and disguise issues related to health equity (Turner et al., 2021). Lastly, the measurement of non-fatal outcomes and non-health related benefits are rarely used, creating a narrow view of the potential benefits of various provisions and a reductionist approach (Turner et al., 2021)

Personalised healthcare offers one alternative viewpoint, acknowledging the need to respond to an individual's situation and tailor healthcare accordingly (Nardini et al., 2021). Through this lens, the rights and dignity of the individual are central and there is a recognition that standardised recommendations are ill equipped to support people to prevent and manage LTCs due to the complex interplay of individual, social, and environmental factors (Nardini et al., 2021). Centredness in health is a disparate term and definitions are widespread, yet, fundamentally it is defined as a philosophy that encourages a shared control of care and holism (Feldthusen et al., 2022; Grover et al., 2021). The approach rejects an illness centred approach and values the person's experiences, beliefs, personhood, and identity (Fazio et al., 2018).

Taking a person centred view of healthcare conflicts with an economic perspective as human rights, equity, and communitarianism values are undermined when health is conflated to mortality, suspect metrics of quality of life, and predefined outcomes that oversimplify how care interacts with health outcomes (Rutstein et al., 2017). The importance of a utilitarian approach, which gives primacy to actions that provide the greatest good for all, is still debated and some argue it's superiority when resources are constrained (Marseille & Kahn, 2019; Savulescu et al., 2020). Nevertheless, the same authors suggest that for health decision making to be ethical it should view success as maximising a good life and not just the level of disease. Discerning what constitutes wellbeing remains a challenge for those undertaking health economic

endeavours (Marseille & Kahn, 2019; Savulescu et al., 2020). Without clarity on what wellbeing entails, there has been a tendency to privilege biomedical indicators, as modern medicine has drifted away from healthcare that aspires to promote 'wholeness' (Hetzler & Dugdale, 2018, p.770) Typical economic modelling therefore renders aspects such as flourishing, happiness, social connection, desire fulfilment, and autonomy as less valuable (Hetzler & Dugdale, 2018; Mitchell & Alexandrova, 2021). It is beyond the scope of this thesis to ruminate over the utility and appropriateness of economic, or value driven, perspectives on LTC, however, it is prudent to question routine practices that present epidemiological and economic data without a critical appraisal of the assumptions that underscore these research approaches.

In tandem, with a growing interest in alternative perspectives within LTCs, is the conceptualisation of health services as complex systems (Rutter et al., 2017; Skivington et al., 2021). Unlike the arguments above, which critique the current thinking about how to make decisions about resource allocations and frame LTCs, complexity science is concerned with the nature of systems and understanding patterns of interactions between elements, acknowledging the multiple levels of influence that dictate behaviour (Gear et al., 2018). Complex system thinking creates a challenge for biomedical research as it rejects ideas of generalisability and the counterfactual argument - in brief, that observed results of an intervention, can be compared to what would have happened if it had not taken place (Pawson, 2018; Rutter et al., 2017). Complexity science purports that healthcare is emergent, self-organising, prone to adaptations, and possess fluid boundaries (Braithwaite et al., 2018; Greenhalgh & Papoutsi, 2019). Although correlations can be identified, providing indications of how phenomena interlink, relationships are irreducible to their constituent parts and generalisable findings are not possible as outcomes are contingent on changes to the context (Papoutsi et al., 2020). A stepwise change in LTC research is needed if research desires to understand the driving forces, and variability, of outcomes. Interventions do not produce outcomes, it is their interaction with the environment, the status quo, and human relationships that produce outcomes (De Souza, 2022). There is a need to undertake research to provide insights that are sensitive to context, to advance the field of preventing and treating LTCs (Davidoff, 2019). Continuing to examine LTCs under an economic and biomedical lens alone will

result in '*complexity denial*' which will leave the field unable to attend to the challenges of LTCs (Pearce et al., 2015, p.11).

1.3 Physical Activity and Health

Physical activity is defined as any muscular movement that expends energy above rest (Caspersen et al., 1985). Enacting PA relies on an individual to change their behaviour and move from rest into active states (Rhodes & Nigg, 2011). Physical activity has consistently been shown to improve health and wellbeing (Myers et al., 2015; Rhodes et al., 2017; Wood et al., 2022). Through an economic lens, inactivity is routinely associated with excess healthcare costs (Nguyen et al., 2022) and costs the United Kingdom (UK) health service approximately £0.7 billion a year (Heron et al., 2019). On average, there is a dose response relationship between PA participation and premature mortality, with higher PA conferring a risk reduction of 20-50% when compared to no weekly PA (Arem et al., 2015; Ekelund et al., 2020; Rhodes et al., 2017; Wang et al., 2021). It is known that PA can prevent cardiovascular diseases, obesity, non-insulin dependent diabetes, some cancers, immune issues, cognitive decline, osteoporosis, and psychological disorders (Anderson & Durstine, 2019; Carbone et al., 2019; Katzmarzyk et al., 2022; Ramakrishnan et al., 2021). In addition, PA is therapeutic for a range of LTC's and is a potent secondary prevention strategy (see Dempsey et al., 2022). The extensive evidence illustrating the role of PA for health has led to increasing recognition, commitment, and urgency to address the levels of worldwide PA (WHO, 2018; 2020).

The role of PA for health has been advocated for centuries, however, the seminal work of Morris and colleagues (1953), who demonstrated that bus conductors were at lower risk of heart issues compared to sedentary bus drivers, was a catalyst for PA research. Since then, evidence has grown rapidly and evolved to understand how the volume, frequency, type and intensity of PA influences health and wellbeing (Gill, 2020). Although research is well established, and policy commitment is strong, 1 in 4 women and 1 in 5 men in the UK are not achieving 30 minutes of moderate PA a week. Moreover, research shows that almost all those with LTCs achieve lower levels of PA compared to healthy populations, and the uptake of PA interventions is low (Aggarwal et al., 2021; Barker et al., 2019). The COVID-19 pandemic magnified the complex relationship between PA and sociodemographic, wellbeing, and medical status. It has been shown that during the COVID-19 restrictions wellbeing and PA levels was

inextricably linked. Some authors showed that the COVID-19 pandemic expanded PA inequalities for gender, medical status, and household income (Sport England, 2020; Marconcin et al., 2022; Puccinelli et al., 2021; Strain et al., 2022) elucidating that subgroups of the population may be underrepresented in the typical PA literature. It has been argued that PA research has largely ignored the importance of cultural and social contexts, emphasised the physiological effects alone, and in perusing legitimacy in the medical sphere has had limited progression in advancing knowledge about PA participation, since Morris and colleagues purported that PA was good for health, in 1954 (Williams & Gibson, 2018).

The current landscape underexplores the social processes to explain why PA behaviour has not occurred on a large scale, underappreciates the diversity of outcomes linked to PA, and disguises how various modes of PA impact different groups. Despite the known ramifications of the social determinants of health, PA behaviour is often conflated to the presence or absence of motivation, without understanding how individual situations influence the impediments to behaviour change (Heino et al., 2021; Williams & Gibson, 2018).

The medicalisation of PA has also rendered aspects of playfulness, emotional arousal and wellbeing defunct, and replaced them with utilitarian health promoting aspirations (Gibson & Malcolm, 2020). Physical activity has a role in self-esteem, self-concept, improving social connectedness, and happiness, which is often not given primacy in health literature (Downey et al., 2021; Eynon et al., 2019). Those with LTCs possess specific challenges to PA and often demonstrate a reduced ability to undertake PA due to a cumulative effect of pain, fatigue, medication side effects, interruptions to their healthcare, and pathophysiology (Abasiyanik et al., 2022; Dasso, 2019). In addition, those with LTCs are more likely to reside in areas that are not amenable to PA, decreasing the opportunity to be active (Dasso, 2019). Physical activity can exacerbate symptoms in people with LTCs, for example, increased pain in those with fibromyalgia and chronic fatigue syndrome (Barhorst et al., 2022). Lastly, the lived experience of those with LTCs shows that disruption to daily functioning is common. Those who have positive experiences learn to maintain agency, adjust fear avoidance behaviours, and find pleasure and a sense of belonging through PA participation, highlighting that the dose, intensity, and mode of PA is less important for generating worthwhile improvements to wellbeing (Hunt & Papathomas, 2020).

1.4 Exercise Referral Schemes

The limitations of viewing PA through a biomedical lens, such as, seeing the body as '*an object for discipline and control*' and removing the person from care (Gray, 2019, p.3) have preceded policy commitments that were reductionist in nature. Yet, the evolution of PA policy in the UK demonstrates an increased focus on the holistic benefits of PA, tackling inequalities, and attempting to bolster the infrastructure needed to address the wider determinants of PA participation as illustrated below.

In 2014, Public Health England published Everybody Active Everyday which produced a framework that aspired to embed PA into all sectors. Since then, the prominence of PA in UK policy has continued to grow, with specific subgroups targeted in the last eight years (Sport England, 2020). The Everybody Active Everyday programme has been independently reviewed and notable system changes are noted. Developments include a greater focus on PA as opposed to sport, greater integration with the transport sector, increased commitment to PA initiatives, and the scaling up of PA surveillance (Ahmad & Rayment, 2020). In addition, Sport England's £250 million commitment to tackle inactivity through the Towards an Active Nation strategy (Sport England, 2016) aspired to realise the five outcomes described in the governments Sport Future- A New Strategy for an Active Nation white paper (HM Government, 2015). Since then it has been noted that Sport England's local delivery pilots have supported innovative system wide programmes to tackle inactivity, which have provided capacity to prioritise PA in local authorities, helping to progress the Everyone Active Everyday agenda (Ahmad & Rayment, 2020). In addition, the current Uniting the Movement campaign aspires to develop diverse networks to disproportionately target those who face the most barriers to PA (Sport England, 2021).

Another notable development within the UK has been a consensus statement, led by the Faculty of Sport and Exercise Medicine, advocating and legitimising PA's role in the treatment of LTCs (Reid et al., 2021). This is seen as an important tool to provide consistent messaging, knowledge, and confidence for UK healthcare professionals to support PA with their patients. The commitment from health agencies is prudent to increase the position of PA in the healthcare system. The Advancing our Health: Prevention in the 2020s document also makes an explicit commitment to personalised care and PA to support LTCs (Department of Health and Social Care, 2019). The National Health Service's 10 year long term plan has made bold commitments to

augment the current health infrastructure to prioritise prevention, self-management, and personalised care, in which, PA is recognised as central to contemporary healthcare (National Health Service, 2019).

Against this backdrop, and the potential of primary care as a trusted source of information to optimise integrated care for a large number of the population (AuYoung et al., 2016), ERSs have been extensively used in the UK and worldwide (Arsenijevic & Groot, 2017). Exercise referral schemes originated in the UK in the 1990s and underwent rapid scale up, with an estimated 600 schemes operating in the UK by 2011 (Pavey et al., 2011). Schemes typically involve inactive attendees with an array of LTCs, receiving a referral by a health professional, to an exercise specialist for a time limited PA programme (Dugdill et al., 2005). Scheme characteristics vary but, in the UK, they are traditionally based in leisure centres, 12 weeks in length, offer a range of biweekly subsidised exercise options and involve pre and post assessment (Rowley et al., 2021). The changing landscape of community care has created adaptations to the delivery of PA schemes. To broaden the conceptualisation of ERSs a recent Delphi study created a taxonomy of ERSs. The study provided a framework to understand the range of options across settings, referral mechanisms, inclusion criteria, organisational matrices, and provision (Hanson et al., 2020). Yet, the central aim of ERSs is to help the *'patient towards an independent, physically active lifestyle'* that can alleviate health issues in the future (Department of Health [DOH], 2001, p.20).

Due to the organic nature of the approach the delivery model has been diverse and the consistency of standards are unknown (Oliver et al., 2016). The lack of reporting and evaluation has created difficulties assessing the impact of ERSs (Hanson et al., 2020). Schemes may be currently misrepresented as there is a partial picture of *'what good looks like'* and conclusions are made due to a lack of comparable data not actual impact (Public Health England, 2014, p.4).

Despite the recognition that ERSs are diverse, and applied practice routinely providing poor and non-comparable data, literature continues to adopt positivist paradigms showing equivocal outcomes (Campbell et al., 2015; O'Brien et al., 2021; Pavey et al., 2011). Consistently, ERSs yield small or no improvements to PA compared to usual care and, through a medical lens, fail to augment modifiable risk factors (Rowley et al., 2018; Taylor et al., 2020). In 2014, NICE undertook a review of the effectiveness

literature and economic modelling to establish the impact of cost utility of ERSs, generating recommendations for ERS research and practice. It was noted, by the NICE team, that comparably little evidence of effectiveness existed, that the environment may not be well suited for some attendees, and that the economic modelling dealt poorly with multimorbidity (NICE, 2014). It was recommended that ERSs should not be funded unless attendees are inactive, have existing health conditions, services incorporate a suite of behaviour change techniques (BCTs), and evaluation is undertaken that aligns with the Standard Evaluation Framework for Physical Activity Interventions (NICE, 2014). Some authors have argued that the current view of ERSs is inaccurate as the research standards needed to inform NICE guidance are not appropriate in ERSs due to their pragmatic and complex nature (Oliver et al., 2016). ERSs are tailored to the resources and needs at a given time, operate outside of statutory regulation, and are shaped by pragmatic and local decisions, meaning it is unlikely Cochrane style criteria will ever be satisfied (Oliver et al., 2016). Inferences drawn from experimental literature also fail to advance an understanding of how schemes can work, for different groups, and the conditions needed to facilitate success (Pawson, 2018). Thus relying on experimental data, or pre/post designs, ignores the black box of implementation and increases the chance of a type III error (Basch et al., 1985; Ridde et al., 2020). Type III errors draw conclusions about programme outcomes without understanding what is being delivered (Schwartz & Carpenter, 1999).

The application of ERSs in other countries may offer insight on how ERSs are delivered, and what practices maximise PA and wellbeing, which is largely unknown in the fitness industry (Stevens et al., 2022). The Swedish version of ERSs has comparable features to the UK systems, yet, Swedish ERSs have achieved superior PA outcomes compared to other countries (Rödger et al., 2016). The accumulating evidence on the role of PA for health led to the development of, Sweden on the Move, a large-scale health promotion campaign. The Swedish Physical Activity on Prescription was part of the campaign. Unlike the UK, referees/ General Practitioners (GPs) are required to be knowledgeable on exercise, the ERS procedures, and behaviour change practices. The referral can be followed independently or by visiting a ERS provider which has a range of exercise choices. There is also a national ERS education programme and 600 page handbook to inform practice (Raustorp &

Sundberg, 2014). Despite the effectiveness of the scheme, the scale up has been challenging and utilisation has been low (Gustavsson et al., 2018). Several implementation barriers are noted including poor healthcare and provider integration, awareness of schemes, leadership, and behaviour change competencies of practitioners (Gustavsson et al., 2018). Although the UK system has not achieved a formal, and integrated, system like in the Swedish model, there are similar implementation barriers evident. Issues identified, through a scoping review of policy documents, include poor integration between healthcare and fitness industry, low standards of practice by exercise specialists, limited use of behaviour change practices across professionals, and poor management (Downey & Golder, 2021). These barriers have been verified by primary research in UK settings, although evidence exploring the factors that influence outcomes is underdeveloped (Duda et al., 2014; Henderson et al., 2018).

Contextual factors, as outlined above, may help explain the limited effectiveness and variable referral, uptake, and retention, within ERSs. Typical review studies show variable uptake (28-100%) and dropout (12-93%) in ERSs (Campbell et al., 2015; NICE, 2014; Pavey et al., 2011). Although ERSs seems to have stagnated since the NICE (2014) guidance, contemporary reviews, which focus on subsets of ERSs, are showing positive outcomes (O'Brien et al., 2021; Onerup et al., 2019; Rowley et al., 2018; Tomlinson-Perez et al., 2022). Yet, authors still privilege positivist assumptions and lament at the heterogenous designs, poor availability of objectively measured PA, and insufficient reporting of intervention content (O'Brien et al., 2021). Continuing to give primacy to positivist research, which values experimental data, will not provide information on why variability exists, what is being delivered, and what works for whom, in what circumstances and why (Oliver et al., 2016).

Complementary approaches, of a translational design, are needed to capture the active ingredients of PA programmes for those with LTCs (Law et al., 2021; Lobelo et al., 2014). The negative discourse of ERSs has been challenged and innovative recommendations for the design, delivery, and evaluation of ERSs have been provided (Oliver, et al., 2021). A complexity perspective provides scope to understand how policy, culture, education, and personal values influence outcomes (Rutter et al., 2017). Successful implementation of ERS requires an awareness of the socio-ecological climate and the motivation and capability of those within the system

(Börjesson & Sundberg, 2013). Therefore, to accumulate an understanding of how PA improvements are achieved in ERSs, more context sensitive research is required (Buckley et al., 2020; Henderson et al., 2018; Sallis, 2019). Unpicking the tacit theory that guides a complex intervention, and the implementation processes, can provide nuanced understanding on how outcomes are achieved (May et al., 2016; Slade et al., 2016). This is salient as the interest in ERSs has not diminished and Ireland, England, and Scotland have shown renewed interest in PA provisions (Health Service Executive, 2016; Public Health Scotland, 2022). Moreover, GPs continue to show interest in having a qualified exercise specialist as part of a referral pathway indicating the opportunity for integration with the medical agenda (Fowles et al., 2018; Law et al., 2021; O'Brien et al., 2017).

1.5 The Role of Behaviour Change Practices

A concern in the NICE guidance was the assumed inadequate implementation of behaviour change practices by practitioners. Yet, behaviour change practices in ERSs are underexplored and delivery practices are underreported (Shore et al., 2019, 2022; Oliver et al., 2021). Without understanding the implementation of behaviour change practices, a rejection of a programme's effectiveness may be made when *'the programme itself is inadequate in terms of design or delivery'* (Green, 2000, p. 126). This means attendees may not be exposed to the delivery model as intended, diluting the outcomes of interest.

As the aim of ERSs is to facilitate long term PA changes in attendees, the primary element of practice should be behaviour change orientated. As mentioned previously, NICE recommended that ERSs should not be commissioned unless behaviour change practices are implemented and ongoing evaluation provides feedback about which delivery approaches work for specific groups (NICE, 2014). Despite many viewing ERS as a panacea to the challenge of LTCs (Shore et al., 2021), there is no allegiance with an, exercise as medicine, agenda (Gray, 2019) and policy guidance, attendees, and practitioners advocate for a person centred approach as a basis for supporting long term behaviour change (DOH, 2001; Eynon et al., 2019; Raustorp & Sundberg, 2014; Shore et al., 2022).

The conceptualisation of Person Centred Care (PCC) in ERS is however not well defined. This corresponds with the wider literature, where no agreed definition of PCC

exists (Grover et al., 2021). Although contested, and spanning multiple fields, centeredness aspires to encapsulate the values, preferences, and experiences of an individual, to forge a partnership between the practitioner and attendee (Feldthusen et al., 2022). Person centred care can be broadly defined as a philosophy that encourages a shared control of care and holism (Grover et al., 2021). Fundamentally, the approach rejects an illness centred approach and aspires to maintain an individual's personhood and identity (Fazio et al., 2018). In PCC, the partnership combines the person's values and experiences with the practitioner's expertise to develop a collaborative care plan (Coulter et al., 2013).

Person centred care is a fundamental practice to activate people in the management of their LTCs (Coleman et al., 2009). '*Patient activation*' involves people acquiring the knowledge, skills, and confidence to adopt healthy behaviours (Hibbard & Greene, 2013). The attendee should be at the heart of the delivery system; however, PCC is more than a practice checklist and a whole systems approach is needed, which recognises the interdependence of organisational processes, responsive commissioning, attendee engagement, and practitioner commitment (Coulter et al., 2013, 2016). Tackling inequalities should also be fundamental to PCC and programmes should consider how to identify those who struggle to engage with their health issues and usual care (Coulter et al., 2013).

Achieving '*patient activation*' leads to better health outcomes, improved care experiences, and decreased health resource wastage (Hibbard & Greene, 2013). Specifically, PCC has been shown to improve PA and explains much of the between study variation in outcomes (Samdal et al., 2017). More recently, it has been shown that PCC is perceived to positively influence physical, behavioural, cognitive, and psychosocial health in PA interventions, primarily through individuals feeling treated as unique and the quality of the therapeutic relationship (Chu et al., 2021).

Achieving the implementation of PCC remains elusive, which may explain the equivocal results in PA programmes and in other health services. Despite the development of numerous conceptual frameworks and essential competencies, PCC in healthcare is rare (Ogden et al., 2017). One potential explanation of the poor translation of PCC is the challenge of an applied setting. Services like ERSs rely on human interpretation, volition, interpersonal characteristics, and organisational context

(Pawson, 2018). For the most part, PCC lacks an awareness of self and relies heavily on unconscious processes (Owen, 1999). This contrasts with many conceptual frameworks which omit context and reduce practice to a set of guidelines (Dewing & McCormack, 2017; Green, 2000). Furthermore, the style of PCC behaviour change counselling, or the implementation process, is less considered within behaviour change science. Yet the way in which the intervention is undertaken is arguably more important than the intervention content (Dombrowski et al., 2016; Downey et al., 2021; Hilton & Johnston, 2017). The biomedical history of ERSs, informal nature, and lack of clarity on what PCC entails, may influence the implementation of core practices and subsequently explain the variability in PA outcomes. Although evidence is lacking to verify these ideas in ERSs, which will be undertaken in this thesis, it has been shown that practitioners beliefs, educational experience, perceived role, and a biomedical ontology hinder the application of PCC principles in practice (Bansal et al., 2022).

The explicit outline of what PCC entails in exercise referral guidance is lacking although tailoring, collaboration, continuity of care and '*motivational communication skills*' are highlighted as important (DOH, 2001, p. 38). In practice, several terms are used including behavioural counselling, Motivational Interviewing (MI), behavioural support, and supervision (see Chapter 2). Behavioural counselling has various interpretations complicating what is envisaged to be delivered to successfully translate PCC to practice (Wattanapisit et al., 2021). Specifically in ERSs, authors have drawn parallels between effective motivational communication, as encouraged in UK national guidance, and MI (Birtwistle et al., 2019). The use of MI to operationalise PCC in ERSs is now widespread (Galbraith et al., 2021; Murphy et al., 2012; Scott et al., 2019; Sjöling et al., 2011; Wade et al., 2020).

Motivational interviewing is a person centred, guiding, counselling style which focuses on collaborative conversations to strengthen an individual's own motivation and commitment to change (Miller & Rollnick, 2013, p.12-21). The approach requires a complex set of skills and MI is not a simple application of tools (Miller & Rollnick, 2009). Despite having an established body of evidence, MI, like ERSs, is impinged by poor fidelity assessment, intervention description, and training provisions (Hurlocker et al., 2020; Lambert et al., 2017; Makin et al., 2021).

Due to the increasing prevalence of MI within ERSs, and congruence with best practice guidance, it could be a useful approach to operationalise PCC in ERSs. Nevertheless, due to the challenges with developing competent MI practices, an adapted version may be useful (Lane et al., 2005). Furthermore, within ERSs policy it is encouraged to adopt BCTs not associated with MI, further confirming the need for an augmented view of MI in ERS practice. Behaviour change counselling may be more realistic and representative of how PCC can be operated in ERSs (Beck et al., 2016; Lane et al., 2005). There is, however, a lack of clarity on what practices of PCC are delivered or expected in ERSs (Shore et al., 2019, 2021). A clear conceptualisation of PCC is important as it provides a menu of principles, strategies, and interaction styles to guide ERS practice. Table 1.1 provides a summary of reoccurring ideas from ERS policy guidance, behaviour change counselling, adaptations of MI, and the PCC literature to consolidate what PCC practice may entail in ERSs (BHF, 2014; Bikker et al., 2015; Breckon et al., 2008; DOH, 2001 Hurlocker et al., 2020; Lane et al., 2005; NICE, 2014; Santana et al., 2019; Slater et al., 2017). There is a need to verify what ERSs see as PCC practice, however, the augmented version of MI developed by Lane and colleagues (2005) is a useful framework which encapsulates core principles and practices from the consultation task undertaken above.

Table 1.1 A summary of expected principles of PCC in ERSs

Core principle of PCC
Collaboration
Genuine caring
Sensitivity
Respect
Continuity of care
Reflective listening
Holism
Autonomy supportive
Open questioning
Supporting conversations and planning for change

1.6 The Role of Behaviour Change Theory

The UK guidance for ERSs recommends that practitioners '*should understand and apply a proven model of behaviour change in interactions with referred patients participating in the referral scheme*' to optimise the chance of PA behaviour change (DOH, 2001, p.38). Guidance also refers to identifying '*motivational processes*', assessing an individual's '*readiness to change*' and supporting PA self-efficacy (DOH, 2001, p.20; NICE, 2014). The guidance clearly evidences the need to identify current and past impediments to behaviour change and redescribe them using established psychological theories.

Physical activity epidemiology continues to advance and package correlates, and potential determinants, of PA into ecological frameworks (Bauman et al., 2012; Rhodes et al., 2017). As the evidence was developing it became clear that simple messaging was insufficient to initiate changes in PA, and in the 1980's a critical pivot was made. The ecological frameworks provide information on factors associated with PA, but are unable to explain how and why factors are linked to PA. The emergence of psychological theories provided constructs to explain behaviour and a lexicon to design PA interventions (Rhodes et al., 2019). The frameworks advanced thinking by providing putative psychosocial impediments to behaviour change which could be modified, resulting in increased motivation and capacity for behaviour change (Sheeran et al., 2017).

Although seminal theories provided direction to understand and improve PA, the utilisation of behaviour change theory has since been fragmented (Michie & Prestwich, 2010). Dominant theories are social-cognitive which privilege individual choice, underpinned by one's values, conflating other drivers of human behaviour (Kelly & Barker, 2016). Traditional frameworks largely ignore aspects like habit, emotion, circumstance, and calculation or structural drivers of behaviour (Greenhalgh, 2018, p. 30-50). Moreover, a review of health behaviour theory identified 82 theories in the literature, however, just four theories accounted for 63% of articles. Without clear guidance on how to select theory; the unique characteristics of theories, or the appropriateness of a theory for a specific setting, implementation will be subpar (Davis et al., 2015).

Yet, behaviour change science has progressed substantially in recent years. The recognition of behaviour as a complex interplay of attitudinal, environmental, humanistic and affective components is noteworthy as it increases the completeness of understanding PA behaviour (Rhodes et al., 2019). Furthermore, the unification of overlapping theoretical constructs has been achieved and a shared definition of BCTs, linked to psychological impediments to change, has been established (Cane et al., 2015; Carey et al., 2018; Michie et al., 2008, 2018). These advancements have increased the accessibility of theory, which is envisaged to advance the implementation of techniques by targeting prudent ingredients for behaviour change (McEwan et al., 2019). This has been helped, in part, by the publication of a BCT taxonomy which provides a definition of 93 evidence based individual techniques (Michie et al., 2011).

The UK guidance encourages tailoring the following BCTs based on individual needs: goal setting, self-monitoring, education, reviews, and feedback (DOH, 2001; NICE, 2014, BHF, 2014). The NICE (2014) guidance formalised the inclusion of BCTs and extended the suggestions to include action planning, relapse prevention planning, and facilitating social support (BHF, 2014; DOH, 2001). Additionally, NICE (2014) signposted to the general behaviour change guidance (NICE, 2007; updated 2014) which encouraged considering digital interventions and a diverse application of BCTs (NICE, 2014). Despite the advancements in behavioural science, and commitment to BCTs and theory in ERS guidance documents, the focus on the implementation of behaviour change practices in ERSs (Hanson et al., 2020; Shore et al., 2019), and in other health services, (Presseau et al., 2021; Toomey et al., 2020) is underdeveloped. A fundamental issue with the adoption of behaviour change practices in ERSs may be the issues with translating behaviour change science to practice, namely the challenges of attendee expectations, the therapeutic relationship, organisational issues and the flexibility required for practice (Bishop et al., 2015). Moreover, the conceptualisation of PA within healthcare may create a difficult implementation climate as it reinforces a biomedical and paternalistic viewpoint (Speake et al., 2016, 2019). Prescribing a dose of PA to treat a medical issue does not address enduring psychosocial factors that lead to sedentary behaviour. The focus, through this medical lens, is on the outcome and not the impediments to PA (Hutchison & Johnston, 2013).

1.7 The Need for Implementation Research

The research to practice gap is well recognised in healthcare, leading to unnecessary practice, resource wastage, and potentially harmful outcomes (Grol, 2001). Examining the implementation of behaviour change practices by ERSs practitioners is needed to advance the field and contribute to the debates about the utility of ERSs, the translation of behaviour change science to practice, and how implementation is influenced by the climate where practice takes place. There is a need to evaluate the processes that occur within complex interventions to provide portable ideas about the conditions needed for scaling up, to strengthen claims about effectiveness (Moore et al., 2015).

Implementation science is a member of a consortium of fields examining the spread and uptake of research findings (Toms et al., 2019). During the last 15 years there has been a rapid expansion in the development, perceived value, and utilisation of implementation science (Braithwaite et al., 2018). There are now numerous multilevel frameworks that provide abstract predictors of implementation (Nilsen, 2015). Despite this, critiques of implementation research remain due to the reliance on measuring and establishing relationships based on pipeline thinking, and an insufficient focus on how context interacts with implementation efforts (Dryden-Palmer et al., 2020). Originally, implementation science possessed naïve assumptions of fidelity, that centred on linear steps to achieve implementation (Braithwaite et al., 2018). Despite an accumulation of the theoretical aspects of implementation, research tends to possess a low ecological awareness and the evidence of implementation processes is lacking (May et al., 2016). Contemporary implementation science acknowledges the need to explore actors contributions to expand theory in action and understand how local context shapes self-organisation (May et al., 2016; Pfadenhauer et al., 2017). In line with conceptualising ERSs as a complex system, the implementation of behaviour change practices will be underscored by sensemaking and responses to interdependencies (Greenhalgh & Papoutsis, 2019). Combining implementation with complexity thinking provides a nuanced examination of implementation, and offers an antidote to historical issues, by valuing the iterative, relational, multilevel, recursive, and interactive features of implementation attempts (Braithwaite et al., 2018).

It is largely unknown to what extent behaviour change practices are used in routine health services (Presseau et al., 2021). Although some have outlined that behaviour

change practices are subpar in ERSs (Beck et al., 2016; Duda et al., 2014) it is not known what research to practice gap exists, which is an important first step in implementation research (Presseau et al., 2021). Outside of ERSs the focus on behaviour change implementation has been impinged by a multitude of factors, primarily the unbalanced investment in, and value of, effectiveness research over translational designs (Moore et al., 2015). A recent narrative review described the commonly cited methodological issues in behaviour change trial based research. Table 1.2 outlines six salient dimensions of methodological issues in behaviour change research (Toomey et al., 2020). The inherent assumptions of trial based designs compounds many of the issues highlighted by Toomey and colleagues (2020). Fundamentally, trying to achieve standardisation, measuring fidelity quantitatively, and a lack of focus on the causal chain generating implementation outcomes is untenable in implementation research (Braithwaite et al., 2018). Alternatively, implementation research should adopt mixed methods, conceptualise implementation as undergoing local adaptation, and explore how practitioners achieve implementation success in specific conditions (Braithwaite et al., 2018; Sarkies et al., 2022).

Psychological theories are increasingly being applied to understand implementation issues (Geng et al., 2022), which can attend to some of the challenges outlined in Table 1.2 by shifting the emphasis to explain how implementation is achieved or fails (Nilsen, 2015; Pfadenhauer et al., 2017). Theoretical constructs provide potential mediators of practitioner behaviour that should be considered against the contextual factors influencing individual responses (Nilsen & Bernhardsson, 2019). The scope of implementation frameworks is well illustrated by Nilsen (2015), who distinguished frameworks by their primary function. Nilsen categorises process models where the aim is to describe research translation; determinant frameworks which outline barriers and facilitators; classic theory which describe causal mechanisms of implementation; implementation theory which centres on explaining implementation and the interaction between concepts; and evaluation frameworks which provide structure for evaluation endeavours. As with general behavioural science, the guidance on how to choose specific frameworks is lacking, however, evidence is emerging, providing decision tools to navigate the cornucopia of choices (Birken et al., 2018; Davidoff et al., 2015). Furthermore, typical implementation frameworks, and policy guidance often fail to specify important information about implementation behaviours. Implementation

behaviours require delineating who should do what, where, when, and how to support practice adoption (Presseau et al., 2019). Therefore, there is a need to examine ecologically valid scenarios to contextualise behaviour change practices in ERS, which is currently lacking.

The breakthroughs in behaviour change science are not routinely transitioning into real world settings. The advances in behaviour change science have not led to increased effectiveness in behaviour change research, and the use of theory versus non theory programmes is contested (McEwan et al., 2019). Moreover, the effectiveness of individual BCTs is inconclusive, which may be explained by poor fidelity. There is a dearth of research exploring how the process of using behavioural science to guide the identification and description of impediments to change using theory and the subsequent linking of impediments to BCTs can be achieved in practice (Luszczynska, 2020). There are also issues with testing behaviour change implementation in trials which are magnified in real world settings which are unable to be standardised complicating typical effectiveness research (Bishop et al., 2015; Presseau et al., 2021). Against a backdrop of behaviour change implementation broadly, the examination of ERS practice is even more underdeveloped. There has been no research examining the how, why, and in which circumstances behaviour change implementation occurs in ERSs. To progress the ERS research, and behaviour change more generally, a theory informed, context sensitive evaluation of the causal mechanisms of implementation is required.

Table 1.2 A description of common methodological issues regarding fidelity to behaviour change practice

Issue theme	Issue description
Lack of standardisation regarding how fidelity is conceptualised and defined	There is diverse nomenclature making it difficult to appraise the utilisation of, and processes undertaken, within behaviour change fidelity research.
Limited focus beyond assessing fidelity of delivery	Fidelity research often focuses on the delivery of the intervention alone. Nevertheless, each step of the causal chain requires examination to increase confidence about which element of the system leads to implementation issues.
Limited use of existing fidelity frameworks or guidance	The use of implementation frameworks is sparse, limiting the potential to understand implementation issues, measure processes and outcomes in a robust fashion, and target salient barriers using theory informed implementation strategies.
Lack of focus on quality and comprehensiveness of fidelity assessment strategies	There is an overreliance on quantitative measures of fidelity and many lack established psychometric properties. There should be preliminary planning about the comprehensiveness and feasibility of measuring fidelity processes and outcomes. The use of mixed methods is encouraged to overcome the current weaknesses of the evidence base.
Lack of explicit focus on the balance between fidelity and adaptation	Behaviour change practices are dynamic, and adaptation is a crucial element of practice. Despite debate on the level of standardisation that is needed, a clear definition on what appropriate level of deviation is acceptable is required.
Poor reporting of how intervention fidelity is addressed	The availability of fidelity information in publications is low. Reporting templates compound this issue as many dominant protocols do not allude to fidelity reporting. When information is present, it rarely provides information of what was found, limiting the field, and defeating the purpose of the fidelity assessment.

1.8 Purpose of the Thesis

The purpose of this thesis is to explore how, why, and in which circumstances behaviour change practices are implemented by ERSs practitioners. The specific aims and objectives are:

Aim

- To produce consolidated, verified, theory informed ideas explaining how behaviour change practices can be implemented by ERSs practitioners.

Objectives

- Identify how behaviour change is used by ERS practitioners uncovering the research to practice gap.
- Unearth ecologically valid priority areas, influencing the implementation of behaviour change practices.
- Evaluate the legitimacy of priority areas by testing ideas to verify and refine ideas about implementation.

1.9 Thesis Structure

Chapter 2: The implementation of behaviour change practices in exercise referral schemes: A narrative review

Chapter two provides a critical examination of behaviour change implementation and attempts to situate the work within ERSs. The purpose of the chapter is to provide a critical integrative overview of the topic and key interpretations centred on behaviour change implementation.

Chapter 3: Methodology and approach

Chapter three provides the philosophical underpinning of the thesis. The orientation of the work, key conceptual assumptions, implications for practices and subsequent methodological traditions will be explained and justified. The ability of the approach to answer the research question will also be explained.

Chapter 4: Behaviour change practices in exercise referral schemes: Developing realist programme theory of implementation

Chapter four presents the first phase of the research, which employs focused ethnography to inform the development of initial ideas on how behaviour change can be successfully implemented in ERSs. The research involves experiencing the implementation climate, observing practitioners, co-theorising with them, and attempting to implement behaviour change practices as a researcher/practitioner.

Chapter 5: Developing and pretesting a mixed methods survey to test programme theory

Chapter five explains the creation of a proxy measure of behaviour change practice and a survey to empirically test the initial ideas. Alternatives to direct observation of behaviour change practice have numerous benefits but require extensive pretesting which is undertaken in this research. The conceptualisation of validity is discussed in relation to the overarching research paradigm. Subsequently the methods used to establish the construct validity of PA behaviour change vignettes and survey items are described.

Chapter 6: Behaviour change practices in exercise referral practitioners: Testing programme theory of implementation

Chapter six presents the testing of the initial theories to refine the first phase of the research. The realist survey is a focal point to refine the ideas about implementation using a diverse sample of ERS practitioners. Physical activity vignettes provide a measure of fidelity which is corresponded to the levels of agreement and disagreement with implementation ideas outlining what is linked to greater implementation outcomes and verified explanations on how successful behaviour change practices are achieved.

Chapter 7: Discussion, original contributions to the research, implications, and conclusion

The last chapter summaries the main findings and original contributions of the research. Key recommendations and implications are provided, based on the results of the research. Reflections on the strengths and limitations of the work are also provided.

Chapter 2: The implementation of behaviour change practices in exercise referral schemes: A narrative review

2.1 Chapter Overview

This chapter presents an integrative narrative review of the evidence exploring the implementation of behaviour change practices in ERSs. Initially, an overview of the key concepts relating to behaviour change and implementation science are provided, framing the narrative review. The rationale for, and description of, the selected narrative review approach will then be outlined, which is followed by a critical interpretive discussion of the current literature describing the current discourse and limitations of the literature. Lastly, a summary of what is currently known about the implementation of behaviour change practices in exercise settings is presented.

2.2 Chapter Introduction

As discussed in Chapter 1 behaviour changes practices consist of tailoring the application of psychological theory, form of delivery, and BCTs to specific scenarios (Dombrowski et al., 2016). Behaviour change practices are prudent within exercise settings to ensure attendees have a positive experience and the chances of long term PA change and improvements to wellbeing are optimised (Grimmett et al., 2021). Behavioural science also involves principles to operationalise PCC, a widely recognised essential philosophy of care, to empower people, personalise care, and work through an holistic lens (Grover et al., 2021). Within this thesis the implementation of behaviour change practices is viewed as occurring within a complex system, meaning behaviour change practices are likely to be disparate and adapted to individual scenarios. Therefore, it is important to acknowledge the influence of contextual factors on how practitioners modify practices in naturalistic settings (Bishop et al., 2015; Heino et al., 2021). Consequently, the term implementation will be instead of treatment fidelity, replacing ideas about the '*faithful replication*' of predesignated practice (Ghate, 2016, p.813) with a recognition that practice should retain an allegiance to core components but engage with local adaptation to meet the needs of specific scenarios (Braithwaite et al., 2018).

2.3 Literature Review Design

Critically synthesising evidence on complex topics that require insight on the state of the field, and the historical nature of knowledge in an area of interest, cannot be answered adequately by adopting Cochrane systematic procedures (Greenhalgh et al., 2018). The translation of evidence to practice requires the disruption of usual practice, necessary shifts to organisational support, individual perspectives and the capability to innovate (Huijg et al., 2015; Reed et al., 2018). Adopting principles of exhaustive identification, rigid inclusion, privileging experimental designs, appraising replication, and calculating effect sizes are not congruent with implementation endeavours as traditional data cannot discern how successful implementation occurs and the conditions needed for success (Greenhalgh et al., 2018). Systematic reviews fail to *'tell the story'* of phenomena (Johnson, 2021, p.6) and are rarely transparent, superior, or exhaustive, contradicting the assumed hierarchy of evidence synthesis (Booth & Carroll, 2015; Furley & Goldschmied, 2021; Greenhalgh et al., 2018).

The following evidence review adopts a narrative design, of which, there are many underscored by the aspiration to provide an *'authoritative argument'* on a topic (Furley & Goldschmied, 2021, p.2). The goal of narrative design is normally to provide an interpretive critique and summary of the literature (Greenhalgh et al., 2018). The forthcoming narrative review will adopt a systematic identification of citations, which is sometimes adopted in narrative reviews (Toronto & Remington, 2020). The approach in this thesis broadly aligns with an integrative narrative review which provides a critical and thorough account of complex phenomena (Whittemore & Knafl, 2005). Importantly, unlike narrative reviews, an integrative narrative review gathers and makes sense of a topic from a variety of perspectives and contrasts insight to accumulate knowledge (Cronin & George, 2020). This is prudent as the heterogeneity of settings is hypothesised to be of relevance in the implementation of behaviour change practice in ERSs. Nevertheless, integrative reviews maintain elements of systematic approaches which are not congruent, or practical, within this thesis. There are established guidelines and expectations for integrative reviews outlining suggested completion timelines, number of team members, data analysis procedures, and quality appraisal procedures (Toronto & Remington, 2020). Published integrative review guidelines demonstrate the clinical origins of the approach which can lead to misleading ideas about narrative reviews (Greenhalgh et al., 2018). The current

approach was therefore informed by more pragmatic suggestions for reviewing evidence within complex interventions (Booth et al., 2013). The stages of the review borrowed guidance from several authors which is consolidated in Figure 2.1 (Booth et al., 2013; Cronin & George, 2020; Toronto & Remington, 2020; Whitemore & Knaf, 2005).



Figure 2.1. The stages adopted during the narrative review

2.4 Literature Search Strategy

Two electronic databases, Pubmed and Scopus, were used to identify citations and they were chosen to optimise coverage while retaining relevancy (Falagas et al., 2008). The adoption of a pre-structured question formulation (e.g. PICO, SPIDER, SPICE) was not used due to the poor fit with the narrative review aim. Despite the perceived utility of pre-specified search formulations, they are more suited for clinical research and the application of formula does not demonstrate increased search sensitivity or quality (Eriksen & Frandsen, 2018). Nonetheless, the awareness of various formulae (Booth, 2016) helped to arrange the electronic search using Boolean operators. A previous systematic review, which I was involved with (Eynon et al., 2019), and ongoing reading of the field, provided the search terms. This ensured the terms were relevant by including the diverse terminology applied in the research (Booth et al., 2018). Search terms were orientated around three areas namely implementation, behaviour change practices, and ERSs (Table 2.1).

Table 2.1. Topic based search terms and arrangement of Boolean operators for the narrative review

Topic	Search terms
Implementation	Implement* OR fidelity OR deliver* OR translat* OR practice* OR utilis* OR use OR appl* OR evaluat* OR assessment OR compliance OR audit OR competence OR identification OR uptake OR improve*
Behaviour change practices	<p>AND</p> <p>"Behaviour change" OR "motivational interviewing" OR "physical activity counselling" OR "physical activity coaching" OR "delivery style" OR "person centred" OR "motivational communication" OR "behaviour change theory" OR interpersonal OR counselling OR CBT OR "cognitive behavioural therapy" OR "patient centred" OR "behavioural support" OR "social support" OR "goal setting" OR "stages of change" OR "transtheoretical"</p> <p>AND</p>
Exercise referral schemes	"Exercise referral" OR "exercise on referral" OR "exercise on prescription" OR "physical activity referral" OR "physical activity prescription" OR "exercise prescription" OR "physical activity on prescription" OR "GP referral" OR "personal train*" OR "exercise professionals" OR fitness OR leisure OR "exercise is medicine"

An initial search of title and abstract fields returned an extremely high number of manuscripts with the majority lacking relevance. Due to the specific interest in the implementation of behaviour change practices in ERSs, the search was repeated using only the title field. There was a paucity of titles covering the review aim which is not surprising given the dearth of implementation studies and the origins of ERSs which are organic and funding constrained (Dryden-Palmer et al., 2020; Dugdill et al., 2005; Shore et al., 2019). There were however manuscripts that had the potential to contribute to the understanding of behaviour change implementation in ERSs (e.g. process evaluations) which did not have the search terms in the title. To mitigate any omissions, two supplementary approaches were undertaken. An electronic search was repeated (PubMed, Scopus, Google Scholar) using only the ERS terms, to ensure manuscripts with the potential to provide insight could be screened for inclusion. Secondly, a menu of iterative techniques was applied from the CLUSTER approach which involves taking '*pearl citations*' and aiming to maximise the identification of linked '*kinship studies*' (Booth et al., 2013). Berry picking, pursuing related projects, and following automated citation suggestions on publisher websites were used to increase the scope of the citation retrieval. Berry picking is an organic process where the reviewer forages for relevant manuscripts through citation searching, checking reference lists, searching relevant journal authors and keywords, and looking for proximate information (Bates, 1989).

2.5 Eligibility Criteria

The review question had three features broadly defined as implementation, behaviour change practices, and ERSs. There were no limits on study design, however, to balance the levels of comprehensiveness with relevance, several filters were adopted, and the specific inclusion and exclusion criteria are outlined in Table 2.2. Initially the general filtering screened citations and included only those in the English language, peer reviewed manuscripts, and citations with an overt label of ERS (or variations of the term). Manuscripts were included from 2001 onwards, as the publication of UK ERS quality standards occurred in 2001 and explicitly outlined the need for behaviour change practices at that time (DOH, 2001).

The citation information from the electronic, and supplementary, searches were imported into a Microsoft Excel matrix. During the first screening phase the search

criteria were used to assess the relevance of titles and articles which did not include key search terms, but looked relevant, were kept for a second screen. Subsequent screening examined the abstract, and if necessary, the full text. Omitted citations were stored in the Excel matrix in another tab to trace decision making and enhance transparency of the approach.

2.6 Study Selection

The initial electronic database search yielded 1,461 citations yet only three of 23 relevant citations explicitly examined the implementation of behaviour change practices in ERSs. A subsequent search using only the ERSs labels yielded 10,800 citations, increasing the scope but proving a manageable level of screening. The broad ERS search, and CLUSTER techniques, provided 22 additional citations and there were 316 duplicates removed from the pool of citations. One paper was relevant but omitted as it was a published paper from this thesis. The trimming process created a total of 45 manuscripts for review and Figure 2.2 provides a PRISMA flowchart for the evidence synthesis.

Table 2.2. Inclusion and exclusion criteria for citation screening

Inclusion criteria
Exercise referral schemes
Behaviour change must be overtly included
Implementation discussed or the focus of the research
Exclusion criteria
Medical led schemes
Multidisciplinary behaviour change schemes
Exercise referral literature that did not include behaviour change practices
Exercise referral literature that did not include implementation aspects of the research

2.7 Analysis and Synthesis

Descriptive information for each paper including the authors, title, year, aim, data collection, cohort, and key results was extracted and stored in a Microsoft Excel matrix.

All screened manuscripts were uploaded to NVivo 12 for detailed analysis, alongside linked analytical memos from reading each paper. The memos were used to advance conceptual development, capture critical insight, and trace evolving themes as the synthesis of the literature unfolded (Toronto & Remington, 2020). A constant comparison approach, as outlined by Miles and Huberman (1994), was adopted, which involved contrasting each emerging theme, from analysing the papers and memos, to consider refinements, consolidation, or new insight. The phases of the analysis included data reduction, data display, and data comparison, which has been advocated for integrated narrative reviews elsewhere (Whittemore & Knafl, 2005).

Data reduction involved organising data from open coding into subcategories to unpick key information, weave patterns, and consolidate critical insights about the state of the field (Cronin & George, 2020). Lower order themes were generated, where information was highlighted and labelled if it was relevant to the review question. Each new inductive label was cross checked with previous subcategories to see if it could reside within existing nodes. Data segments were given a new label if it conflicted previous lower order themes or provided new insight. Once coding was completed, subcategories were checked for overlap and the lower order themes were grouped under higher level theme names. Data display was an ongoing process and handwritten mind mapping allowed the processing of large information and identification of reoccurring areas of interest for the review question (Miles & Huberman, 1994). The evolving mind maps, clustering of subcategories, frequency of coding within subcategories and contrasting viewpoints provided tools to compare the field and synthesise the literature (Whittemore & Knafl, 2005). Due to the nature of the field, the themes were not restricted to the barriers and facilitators of implementation alone, but also included critiques and juxtapositions between research traditions.

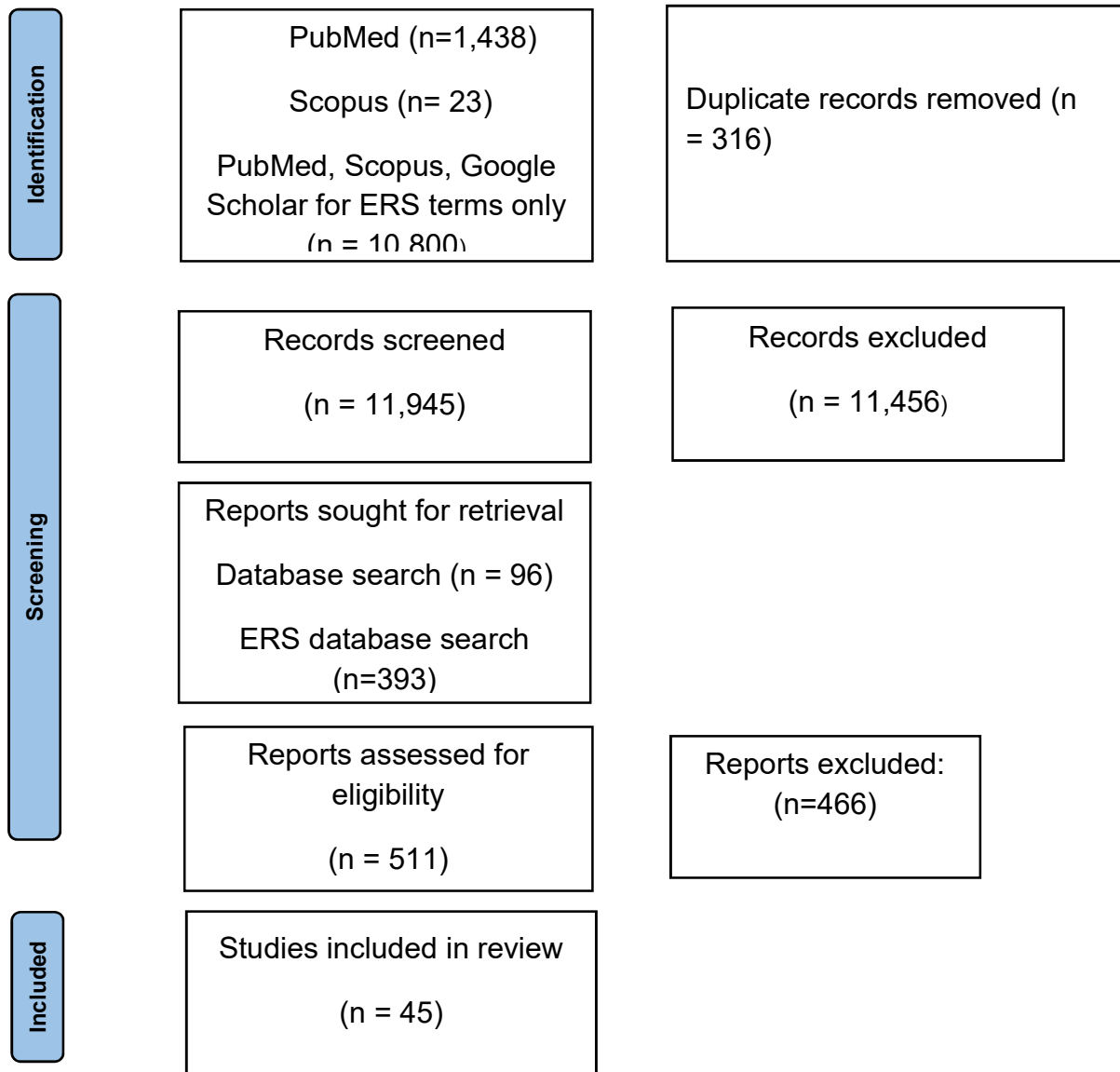


Figure 2.2 PRISMA flowchart outlining the study selection process

2.8 Results

The results will be presented by initially providing a descriptive overview of the included manuscripts (Table 2.3) which provides insight into the dominant paradigms and historical purpose of research, focusing on the implementation of behaviour change practices in ERSs. Then an interpretive overview of the field will be presented, which consolidates the state of the field and provides a critical commentary on the limitations that currently exist (Greenhalgh et al., 2018). Lastly, a more traditional narrative review will present the current knowledge related to the factors which influence the implementation of behaviour change practices by ERS practitioners.

2.8.1 Overview of Citations Included

Commentaries

Three manuscripts from the narrative review did not include primary data, with one presenting three case studies of successfully implemented PA programmes providing recommendations for future research to narrow the knowledge to practice gap (Wurz et al., 2021). The other two commentaries called for an increased emphasis on behavioural science in exercise settings. One provided an overview of the current evidence on cancer prehabilitation, illustrated how behavioural science could strengthen the functioning of programmes, and outlined how current research does not provide a robust focus on behavioural practices (Grimmett et al., 2021). The last commentary paper described the approaches used to evaluate the implementation of motivation theories in PA programmes, with authors noting the paucity of PA research with fidelity/implementation in the title, abstract, or keywords and discussing the challenges to researching the implementation of behaviour changes practices in PA programmes (Quested et al., 2017).

Cross Sectional Survey Designs

Four of the included citations were cross sectional survey designs with three of the four manuscripts aiming to understand the predictors, antecedents, and mediators of behaviour change practices (as defined by the Self Determination Theory). All three of these manuscripts measured aspects of organisational environment (e.g. work motivation, work needs satisfaction, work frustration, workload) as potential factors influencing the implementation of behaviour change practices (Raposo et al., 2020;

Sánchez-Oliva et al., 2021; Silva et al., 2017). Only one of the three studies considered a comprehensive set of factors that may influence implementation beyond work environment (Raposo et al., 2020). The final survey aimed to understand the current format and delivery approaches of ERSs in the UK and captured minimal information on behaviour change practice, evaluation, or implementation monitoring (Rowley et al., 2021).

Evaluation Designs

Eight citations were considered evaluations, with three out of the eight adopting aims and methods which are in line with process evaluations (Moore et al., 2015). Three studies aimed to understand the perspectives of those implementing a PA programme in real world settings, the factors influencing the translation of behaviour change into practice and the evolution of the intervention over time (Buckley et al., 2018; Carr et al., 2021; Moore et al., 2012). The remaining five evaluations examined the implementation of behaviour change practices in exercise settings (Beck et al., 2016; Dineen, et al., 2021a; Dineen et al., 2021b; Gagnon et al., 2018; Hoekstra et al., 2021). Two of these studies also explored the engagement with, and feasibility of, the intervention which provided contextual information about how implementation may succeed or fail (Beck et al., 2016; Dineen, et al., 2021b). In addition, one of the citations appraised the effectiveness of behaviour change training and the authors presented data regarding training satisfaction, practitioner learning, skill enactment, and perceived exposure to counselling (Dineen, et al., 2021a).

Longitudinal Designs

Three citations were longitudinal observational designs and two of these three focused on the effectiveness of ERSs in improving quality of life, PA, aerobic fitness and obesity status (Andersen et al., 2020; Blom et al., 2020). One of studies had a secondary aim to unpick the predictors of outcomes, including participant characteristics and intervention components (Blom et al., 2020). Both citations had no measure of implementation and assumed interventions were delivered as intended. The final paper tracked the implementation trajectories of practitioners over time and explored factors associated with high implementation trajectories. Lastly, the authors explored if the heterogeneity of implementation was associated with changes in attendee behaviour change (Hoekstra, et al., 2017a).

Table 2.3. Overview of study characteristics included in the review

Citation details	Country	Design	ERS setting	Implementation focus
Andersen et al., (2020)	Sweden	Observational	Swedish Physical Activity on Prescription with variable intensities of counselling between groups	No
Balducci et al., (2019)	Italy	RCT	3-year biweekly exercise specialist and theoretical counselling sessions based on the Italian Diabetes and Exercise Study	No
Beck et al., (2016)	UK	Evaluation	Leisure facility based 12-week ERSs	Yes
Blom et al., (2020)	Norway	Observational	3-month healthy lifestyle MI based programme led by physiotherapy, exercise, or health staff	No
Buckely et al., (2018)	UK	Evaluation	Co-developing a new model of ERS, from a traditional leisure-based programme	Yes
Caperchione et al., (2021)	Australia	Qualitative	Diverse range of settings and staff including exercise professionals- physiologists, physiotherapist, and exercise scientists	Yes
Carr et al., (2021)	UK	Evaluation	12-month MI and behaviour change home and leisure based ERS with the option for a 'buddy' service	Yes
Czosnek et al., (2021)	Australia	Systematic review	Any PA programme for cancer patients with reported implementation outcomes	No
Dineen et al., (2021a)	Canada	Evaluation	3-week diabetes prevention programme based on MI and BCTs run by fitness facility staff	Yes

Dineen et al., (2021b)	Canada	Evaluation	3-week diabetes prevention programme based on MI and BCTs run by fitness facility staff	Yes
Dineen et al., (2022)	Canada	Qualitative	3-week diabetes prevention programme based on MI and BCTs run by fitness facility staff	Yes
Duda et al., (2014)	UK	RCT	10–12 week standard ERS versus an autonomy supportive version of the programme	Yes
Gagnon et al., (2018)	Canada	Evaluation	Purposive sample of highest ranked student exercise kinesiologists	Yes
Galbraith et al., (2021)	UK	Quasi experimental	A MI and theory led brief (1-4 sessions) or 12-week programme for older adults	No
Gallegos-Carrillo et al., (2017)	Mexico	RCT	Brief medical profession PA counselling compared to a 16-week theory led ERS	No
Gray, (2019)	UK	Scoping review	Exercise profession, personal trainer, fitness instructor used as key terms	Yes
Grimmet et al., (2021)	UK	Commentary	Focused on the role of behaviour specialists to enhance implementation in exercise programmes in cancer prehabilitation	No
Gustavsson et al., (2018)	Sweden	Qualitative	Swedish Physical Activity and Prescription	Yes
Hoekstra et al., (2017a)	Netherlands	Evaluation	Post rehabilitation PA counselling support underpinned by MI (4 sessions) led by sports therapist or physiotherapist	Yes
Hoekstra et al., (2021)	Netherlands	Observational	Post rehabilitation PA counselling support underpinned by MI (4 sessions) led by sports therapist or physiotherapists	Yes

Hoekstra et al., (2017b)	Netherlands	Qualitative	Post rehabilitation PA counselling support underpinned by MI (4 sessions) led by sports therapist or physiotherapist	Yes
James et al., (2017)	Australia	RCT	Exercise physiologist 13-week theory led counselling and group based exercise	No
Lambert et al., (2017)	UK	Systematic review	Behaviour change PA programmes that included fidelity reporting	No
Mazzoni et al., (2020)	Sweden	Evaluation	Varying intensity of exercise and BCT application in cancer patients within a 6-month intervention led by physiotherapists and personal trainers	No
Moore et al., (2012)	UK	Evaluation	16-week MI ERS with qualified exercise instructors	Yes
O'Brien et al., (2021)	Canada	Scoping review	Qualified exercise professionals- exercise scientist, fitness consultant, exercise instructor, exercise physiologist, sport scientist, kinesiologist, physiotherapist	No
O'Shea et al., (2016)	UK	Scoping review	Explored the role of PA and exercise interventions with a focus on fidelity	Yes
O'Halloran et al., (2014)	Australia	Systematic review	Any PA programme that employed MI within an adult population with LTCs	No
Purdy et al., (2022)	Canada	Scoping review	Any adult cancer supervised exercise programme that focused on implementation	Yes
Quested et al., (2017)	Australia	Commentary	A broad call to advance implementation in PA settings including sport, education, and health	Yes

Raposo et al., (2020)	Portugal	Cross sectional	Surveyed exercise professionals including personal trainers, gym instructors, and group class leaders	Yes
Reale et al., (2021)	UK	Training development	Exercise professionals including physiologists, physiotherapists, personal trainers, and fitness managers	Yes
Rogers et al., (2015)	USA	RCT	12-week theory led programme with weekly supervised exercise and group based discussions for people with cancer led by ASCM exercise specialists	No
Rowley et al., (2021)	UK	Cross sectional	Traditional ERSs	No
Sánchez-Oliva et al., (2021)	Portugal	Cross sectional	Surveyed exercise professionals including personal trainers, gym instructors, and group class leaders	Yes
Shore et al., (2022)	UK	Qualitative	Traditional 12-week leisure based ERS	Yes
Silva et al., (2017)	Portugal	Cross sectional	Surveyed exercise professionals including personal trainers, gym instructors, and group class leaders	Yes
Sjöling et al., (2011)	Sweden	Pre/post	Swedish Physical Activity on Prescription with nurse led MI as 3,9 and 15-month intervals	No
Smith et al. (2021)	USA	Pre/post	12-week theory led programme with weekly supervised exercise and group based discussions for people with cancer led by ASCM exercise specialists	Yes
Sørensen et al., (2008)	Denmark	RCT	Theory led PA counselling at baseline, 4, and 10 months with a 4-month supervised group exercise intervention with physiotherapists	No

Spence et al., (2022)	Australia	RCT	A 12-week supervised person centred exercise programme for cancer patients led by an exercise physiologist	No
Stacey et al., (2010)	USA	Systematic review	Surveying exercise professionals including personal trainers, gym instructors, and group class leaders	No
Williamson et al., (2015)	UK	Systematic review	Behavioural PA interventions for those with lower limb osteo arthritis	No
Wurz et al., (2021)	Canada	Case studies	10–12-week behaviour change and exercise programme underpinned by MI and the Dinnen et al., (2021) project	Yes
Yang et al., (2015)	Taiwan	Quasi experimental	6-month programme with three weekly sessions led by certified trainers underpinned by theory	No

Qualitative Designs

Five of the citations were qualitative designs, with three adopting semi structured interviews and two utilising focus groups. Four of manuscripts explored the factors envisaged to influence the implementation of behaviour change practices (Caperchione et al., 2021; Dineen et al., 2022; Gustavsson et al., 2018; Hoekstra et al., 2017b). The final qualitative study explored practitioners experiences and perceptions of motivating and supporting adherence in attendees to ERSs (Shore et al., 2022). The settings in which the interventions were delivered were diverse and included diabetes prevention (Dineen et al., 2022), traditional ERSs (Gustavsson et al., 2018; Shore et al., 2022), ERS in rehabilitation (Hoekstra, et al., 2017b) and ERS in cancer care (Caperchione et al., 2021).

Experimental Designs

All ten studies were randomised control trials; however, one was a pragmatic trial and two adopted quasi-experimental allocation of participants. Although all ten had an aspect of behaviour change in their title, none of them measured the implementation of the intervention. Many of the trials undertaken were academic led, involved researchers instead of practitioners, and had a format not typical of ERSs (Balducci et al., 2019; James et al., 2017; Mazzoni et al., 2020). The impact of the interventions was trivial, with many studies showing no difference between the level of supervision, experimental arms, or the application of BCTs on outcomes (Duda et al., 2014; Gallegos-Carrillo et al., 2017; Mazzoni et al., 2020; Sørensen et al., 2008; Spence et al., 2022). There was no process data available for these studies, although in one study the authors noted that the practitioners showed a low compliance to behaviour change practices, which may explain the poor effect of the interventions (Duda et al., 2014). Most trials prioritised physiological outcomes, attendance, and dropouts. Authors drew inferences about engagement and effect from indirect outcomes, for example, one study measured '*stage of change*' from the Transtheoretical model (see Rhodes & Nigg, 2011). Finally, one trial outlined a robust suite of evaluation plans including exploring the factors that influence implementation and outcomes (Rogers, et al., 2015), however, there was no presentation of, or subsequent publication with, this information.

Pre/Post Designs

Two studies were pre/post designs with no comparative group, one of which was a 15-month longitudinal pilot (Sjöling et al., 2011) and the other a pre/post intervention evaluation with no comparator group (Smith et al., 2021). The sample size was small in both (n=21 and n=16 respectively) and the primary aim was to explore the effectiveness of the programmes on health-related variables in naturalistic settings. One paper also used the evaluation to explore approaches to support future implementation and asked a range of stakeholders for feedback about how organisations could be prepared to implement the programme in other settings (Smith et al., 2021).

Evidence Review Designs

Nine manuscripts were evidence reviews including four scoping reviews (Gray, 2019; O'Brien et al., 2021; O'Shea et al., 2016; Purdy et al., 2022) and five systematic reviews (Czosnek et al., 2021; Lambert et al., 2017; O'Halloran et al., 2014; Stacey et al., 2010; Williamson et al., 2015). Two reviews were interested in the knowledge base, and knowledge mobilisation, of exercise practitioners. One of these was interested in the knowledge translation practices of exercise professionals (Stacey et al., 2010) whilst, the other was a scoping review which took a philosophical approach and outlined the issues with the '*scientism*' of exercise (Gray, 2019). In line with the historical paucity of implementation studies, two scoping reviews (O'Shea et al., 2016; Purdy et al., 2022) and one systematic review (Czosnek et al., 2020) aimed to examine the implementation of ERSs. O'Shea and colleagues (2016) were interested in how authors define, assess, and report the fidelity of behaviour change components, whereas Purdy's team (2022) appraised ERSs potential for translation to usual practice in cancer care.

Conversely, three reviews were solely interested in the impact of behaviour change programmes on various health related variables and not the quality of implementation (O'Brien et al., 2021; O'Halloran et al., 2014; Williamson et al., 2015). Finally, Lambert and colleagues (2017) had a similar aim to Czosnek and colleagues (2021) to explore how fidelity is measured in ERSs.

Finally, one paper was a training development paper in which behavioural and contextual factors that may impinge implementation were generated from those within

the system before the training was piloted. From the preparatory work and pilot, the authors specified six salient practitioner behaviours to support the implementation of the intervention. The authors used behavioural science to embed BCTs into their training to maximise the or abandoning of current practices and uptake of innovations (Reale et al., 2021).

2.8.2 The Current Research Context and Limitations in the Literature

Prior to outlining the factors associated with the implementation of behaviour change practices, it was prudent to detail the current limitations of the field and the historical evidence which has been prioritised. Several features of the current evidence are noteworthy to the researching the implementation of behaviour change practice namely, the lack of consideration for the complexity of implementation, the insufficient coverage of fidelity, the mechanistic view of behaviour change practices, the biomedical fallacy, and the diversity of exercise referral components.

2.8.2.1 The Lack of Consideration of Implementation Processes

A consistent theme in the literature was the need to understand the implementation of behaviour change practices in ERSs and research outlined that the predictors of behaviour change practices in exercise professionals are largely unknown (Raposo et al., 2020; Sánchez-Oliva et al., 2021; Shore et al., 2022; Silva et al., 2017; Stacey et al., 2010).

Yet many studies prioritised outcome measures without considering how variations in implementation may influence success/failure (Andersen et al., 2020; Balducci et al., 2019; Blom et al., 2020; Galbraith et al., 2021; Gallegos-Carrillo et al., 2017; James et al., 2017; Mazzoni et al., 2020; OBrien et al., 2021; Sjöling et al., 2011; Sørensen et al., 2008; Spence et al., 2022; Williamson et al., 2015; Yang et al., 2015). The authors presented arguments to explain poor outcomes including the inadequate standardisation of practice (Balducci et al., 2019; Gallegos-Carrillo et al., 2017; Mazzoni et al., 2020) and limitations of the instruments used to measure outcomes (Duda et al., 2014), PA, and attendee characteristics (Balducci et al., 2019; Galbraith et al., 2021; O'Brien et al., 2021; Purdy et al., 2022). There was a limited consideration that attendee's variable exposure to the intervention components may explain the inconsistent outcomes.

Following on from this, the paucity of research exploring the conditions which influence the implementation of ERSs, or the emerging processes that augment practice, were discussed (Carr et al., 2021; Czosnek et al., 2021; Dineen et al., 2022; Dineen, et al., 2021; Gagnon et al., 2018; Grimmett et al., 2021; Gustavsson et al., 2018; Hoekstra, et al., 2017a; Hoekstra, et al., 2017b; Moore et al., 2012; Reale et al., 2021; Rowley et al., 2021; Shore et al., 2021; Williamson et al., 2015; Wurz et al., 2021). Authors outlined the need for process evaluations, highlighted the lack of work exploring implementation, and critiqued the lack of monitoring of intervention adaptations in response to contextual factors.

Lastly, there was a smaller body of evidence discussing implementation more explicitly, highlighting that the monitoring of implementation is not aligned with best practice, stunting knowledge on how behaviour change practices can be successfully implemented (Beck et al., 2016; Czosnek et al., 2021; Dineen, Bean, et al., 2021; Lambert et al., 2017; Moore et al., 2012; O'Shea et al., 2016; Purdy et al., 2022; Quedstedt et al., 2017; Ronkainen & Wiltshire, 2019; Smith et al., 2021).

2.8.2.2 An Insufficient Coverage of Behaviour Change Measurement

Although many of the studies failed to consider the delivery of the intervention, others have a strong theoretical base (Williamson et al., 2015). Nevertheless, the exploration of how programme logic models, theoretical underpinning, or training is translated to practice is lacking and there are limited studies which appraise the levels of acceptability of interventions from the perspective of practitioners, or how implementation aligns with pre planned protocols (Czosnek et al., 2021; Quedstedt et al., 2017). Although intervention descriptions are improving; one study found no authors describing the envisaged determinants of attendee behaviour and subsequent behaviour change practices of exercise practitioners (Grimmett et al., 2021). Conversely, the current narrative review found one paper with a robust process to develop and deliver training based on attendee and practitioner behaviours (Reale et al., 2021). Nevertheless the subsequent evaluation plans set out were not followed up with the publication of evaluation outcomes.

Although the conceptualisation of behaviour change practice is an issue, a more general issue relates to the subjective measurement of implementation. Many studies used self-report surveys to measure implementation (Dineen et al., 2022; Raposo et

al., 2020; Sánchez-Oliva et al., 2021; Silva et al., 2017), others used notes from practitioners about deviations from expected practice (Mazzoni et al., 2020), and some studies used checklists (Dineen, et al., 2021a; Dineen, et al., 2021b). This is prudent given that objective data about practice has shown poor convergence with self-reported data (Lambert et al., 2017). This may be exaggerated when the measurement tools are unable to capture diverse aspects of practice (e.g. humanistic care). Many studies did not describe their behaviour change content at all (Grimmett et al., 2021), however, where authors did, there were binary views of implementation which is highlighted as a limitation of the research (Dineen et al., 2021a).

2.8.2.3 The Current Mechanistic View of Behaviour Change Practices

The current evidence conflates the practice of behaviour change to a checklist of practice or menu of techniques misrepresenting expectations of optimal care (Rowley et al., 2021; Shore et al., 2022; Silva et al., 2017). One study did critique the conflation of behaviour change to a list of tools and created their own criteria of 38 MI techniques (Gagnon et al., 2018). However, despite their initial critique their own checklist underrepresented the complexity of the relational aspects of behaviour change practices.

Elsewhere, authors conceptualised behaviour change practice as solely an educational/ learning intervention (Dineen, et al., 2021b; Gallegos-Carrillo et al., 2017; O'Brien et al., 2021; Williamson et al., 2015), demonstrating a one dimensional view of behaviour change practice. One study mentioned supervision without detailing the actual practices (Williamson et al., 2015) and another study refers to the use of MI without defining what practitioners are envisaged to deliver (Hoekstra, et al., 2017a). Lastly, in a robust training and intervention development study, the authors conflated behaviour change practice to the provision of behavioural support and fell into the trap of defining practice as a list of techniques alone (Reale et al., 2021).

The distinction between the programme elements is also not clear and there is no disaggregation between the components of the exercise programme. Where implementation was assessed, it referred to the implementation of the exercise interventions and not specific behaviour change practices, diluting the emphasis on behaviour change practices (Grimmett et al., 2021; Purdy et al., 2022; Wurz et al., 2021).

There was a small body of work that recognised the complexity of behaviour change practice, which contrasts with the dominant paradigm advocating for greater compliance to checklists to ensure that replication can be achieved (Lambert et al., 2017). Quested and colleagues (2017) highlighted that practices like MI require adaptation and collaboration with individuals and as such there is no exact formula of optimal behaviour change practice. This is supported by Czosnek and her co-authors (2021), who explain that tailoring practice is fundamental for good behaviour change practice. What must be established, therefore, are the core components of practice, or the minimal expectations of delivery, which is currently not addressed in the literature.

2.8.2.4 The Biomedical Fallacy

A contributing factor to the conflation of behaviour change practice may be the dominance of the biomedical model, where attendee experiences are reduced to a *'mechanistic, techno-rational application of scientific data'* (Gray, 2019, p.6). People are seen as a combination of their demographics and responses to a dose of exercise issued by the expert practitioner. Gray (2019) argues that the current ontology of exercise may lead to a diminished value of professional wisdom, the experiential art of supporting people, and the phenomenological aspects of health.

The biomedical nature of the research was noted throughout the reviewed manuscripts and research gave primacy to exploring the role of dispensing an exercise dose and measuring safety, adherence, and clinical outcomes (Balducci et al., 2019; Beck et al., 2016; Blom et al., 2020; Caperchione et al., 2019; Mazzoni et al., 2020; O'Brien et al., 2021; Spence et al., 2022). The current ERS culture privileges exercise programming and changing clinical outcomes over supporting the implementation of behaviour change practices (Buckley et al., 2018; Rowley et al., 2021). As Gray (2019) notes, this creates expectations about practice and can shape the practitioner's identity. Under this guise ERSs are about competent practitioners giving accurate, expert, advice which can be standardised to support LTC management. Caperchione and colleagues (2019, p.2491) exemplify this and note that medical professionals encourage the integration of exercise practitioners as they do not know what to tell attendees *'exactly what to do'*. This direct quote illustrates the medicalisation of exercise and the removal of the patient voice, which creates a tension when trying to

practice in a person centred manner. The incongruent biomedical culture is further demonstrated by the barriers noted by practitioners when trying to implement MI. There is an enduring priority to use the consultation to collect medical data which impinges on other consultation elements (Moore et al., 2012). The biomedical model is further illustrated in the work by Gustavsson et al. (2018) where, despite the Swedish model being underscored by person centred care and having five components, many stakeholders viewed the scheme as a written exercise programme alone. The current biomedical culture is a poor fit and is creating issues with the research, practice, and appraisal of ERSs.

2.8.2.5 Diversity of Exercise Referral Components Creating Interpretive Challenges

Within the citations reviewed in this narrative review there was no consistency for *any* ERS elements, creating issues with appraising the factors impacting behaviour change practice. Traditional ERS are a combination of supervised exercise prescription and behaviour change practices with the aim to support long term behaviour change in sedentary people with long term conditions (DOH 2001; Public Health Scotland, 2022; Raustorp & Sundberg, 2014). Yet, many authors in the evidence reviewed deviate from the core tenets of ERSs, for example, O'Brien and colleagues (2021) undertook a scoping review of ERSs with qualified practitioners and included studies with PA counselling, exercise alone, or a combination of both and included studies with people presenting with, and without, LTCs which contradicts the NICE guidance (see Chapter 1). The reviewed literature also lacked consistency in relation to the staffing groups used and included exercise physiologists, exercise scientists, fitness staff, physical therapists, sports therapists, kinesiologists, and physiotherapists (see Table 2.3).

The duration of programmes, and menu of provision, also had no pattern and one scoping review described studies ranging from three contact points to three years (O'Brien, et al., 2021). The primary research summarised in the current narrative review ranged from three weeks (Dineen et al., 2022) to three years (Balducci et al., 2019). Some schemes were underpinned by social cognitive theories (Carr et al., 2021; Duda et al., 2014; Galbraith et al., 2021; Gallegos-Carrillo et al., 2017; James et al., 2017; Rogers, et al., 2015; Smith et al., 2021; Yang et al., 2015), some studies were guided by MI (Blom et al., 2020; Carr et al., 2021; Dineen et al., 2021a; Galbraith

et al., 2021; Hoekstra et al., 2017a; Moore et al., 2012; O'Halloran et al., 2014; Sjöling et al., 2011; Wurz, et al., 2021) and others had no clear outline of their behavioural intervention content. There was also the application of vague terms like motivational strategies and counselling which was highlighted as an issue (Gallegos-Carrillo et al., 2017). Some schemes utilised outdoor PA with multiple options (Blom et al., 2020), sport (Dineen et al., 2022), group work (James et al., 2017; Rogers et al., 2015; Smith et al., 2021; Sørensen et al., 2008) and online options (Williamson et al., 2015). Newer manuscripts used coproduction and community involvement approaches to increase the relevance and ownership of ERSs by stakeholders (Buckley et al., 2018; Carr et al., 2021; Dineen et al., 2021a). Lastly, the role of ERS practitioners in a multidisciplinary team was variable, with one citation positioning the exercise practitioner as part of a clinical team involving physicians and diabetes specialists (Balducci et al., 2019). Interestingly, in another study nurses provided the behavioural support independent of the exercise practitioner (Sjöling et al., 2011).

Many citations were not typical of applied settings and the research conditions may complicate the current evidence. Several studies had strict criteria and ample resource which is not representative of real world ERSs. For example, in the work of Sørensen and colleagues (2008), participants had to be willing to pay for care and be motivated to change their PA and staff interested in the project nominated themselves to receive training. Likewise in Gagnon et al. (2018), only the highest ranked final year university kinesiology students were used as practitioners. Lastly, in the work of Hoekstra and colleagues (2017a), the inclusion criterion stipulated organisations must be willing to implement and continue the programme, invest in the programme, and comply with the research procedures for the entirety of the project.

Although heterogeneity is expected, without well-defined components, it is difficult to examine which factors influence behaviour change practices. The variety of intervention content, infrastructure, staffing, attendee characteristics, organisational support, medical integration, and culture creates a challenge for the field. Each combination of factors will provide an infinite interplay of contextual factors due to the large number of moving parts.

Before the narrative review presented here there has been no consolidation of how various ERSs differ, or how contrasting features influence the implementation of

behaviour change practices (Quested et al., 2017). Understanding how implementation can be achieved within the constraints of usual care is paramount to highlight which components of care are plausible, and which aspects of context influence delivery.

2.8.3 Factors Influencing the Implementation of Behaviour Change Practices

The previous section provided an overview of the field, the historical evolution of the research, and a critical interpretive commentary outlining the limitations of existing research. The following section provides an informed account of what is known about the factors likely to influence the implementation of behaviour change practices in ERSs. The themes will be organised into the following categories: attendee characteristics, practitioner characteristics, work environment, organisational factors, partnerships, and learning climate. Figure 2.3 illustrates the refined data display phase of the narrative analysis.

2.8.3.1 Attendee Characteristics

Attendees often arrive at leisure settings scared, anxious, and feeling out of place due to the intimating environment, and it is postulated that the application of MI skills is more difficult under these circumstances (Quested et al., 2017), as practice must focus on reassurance instead of behaviour change (Shore et al., 2022). Working with attendees who may be hesitant alters the practitioner's beliefs about their ability to support change (Reale et al., 2021). The attendee's worry and unease, and the subsequent lack of optimism about the likelihood of behaviour change from practitioners, is magnified when attendees receive no prior communication from medical staff about the scheme and ERS consultation times are short (Reale et al., 2021; Shore et al., 2022).

The term '*challenging*' was used in the literature to describe some attendees and attendee's level of motivation is highlighted as important for successful implementation (Hoekstra, et al., 2017b; Reale et al., 2021). Worse behaviour change implementation outcomes are noted when attendees have lower baseline motivation, confirming the increased difficulty of implementation in these scenarios (Beck et al., 2016; Raposo et al., 2020). Practitioners valued booster training to develop skills to deal with less motivated individuals (Carr et al., 2021). Attendees also become closed off to change and frustrated where the integration between medical professionals and ERSs is

inefficient, which can potentially make implementation more difficult (Caperchione et al., 2021; Reale et al., 2021). It is postulated that the level of attendee motivation can augment the levels of work motivation, frustration, and desire to work in ERSs. Retention is greater in high socioeconomic, English speaking, and well educated groups, potentially verifying this relationship (Duda et al., 2014; Purdy et al., 2022).

2.8.3.2 Practitioner Characteristics

The attitudinal beliefs of practitioners were highlighted as important for the implementation of behaviour change practices and where practitioners perceive behaviour change practices to be compatible with the organisational agenda it is more likely they will employ behaviour change approaches. Applying behaviour change approaches, and seeing their impact, also has a reinforcing effect on their attitudes (Dineen et al., 2022; Moore et al., 2012). Conversely, where staff perceive they already implement behaviour change practices, or view the consultation solely about gathering information, there is no expected benefits and adoption is hindered (Buckley et al., 2018; Moore et al., 2012). Several external and internal factors augment the relationship between perceptions and implementation. The training norms prioritise a medical model lens which may lead to deep rooted ideas about practitioners professional duties (Gray, 2019; Raposo et al., 2020). In addition, it was shown that as self-efficacy increases the value of behavioural approaches also increases, so beliefs about capability may create a chain reaction on value, engagement, practice, and subsequent self-efficacy (Dineen et al., 2022; Reale et al., 2021). Personality and tendency to react to organisational pressure may also explain the variation in the implementation of behaviour change practices (Raposo et al., 2020). This is demonstrated where organisational pressure can decrease the perceived importance of behaviour change practice (Duda et al., 2014). Conversely, it has been shown that personal commitment to support attendees supersedes the organisational pressure to secure gym memberships (Shore et al., 2022). Several authors outlined that positive, committed, and enthusiastic practitioners are associated with envisaged, and actual, implementation of behaviour change practices (Dineen et al., 2022; Hoekstra, et al., 2017a; Shore et al., 2022).

One manuscript also discussed how the positive and committed practitioner has a role to spread the innovation to colleagues, by changing the practice norms (Hoekstra, et

al., 2017a). In addition one study explored how practitioner attributes influence the implementation of behaviour change practice and demonstrated that women, and those with greater than eight years' experience, were more likely to implement behaviour change practices (Raposo et al., 2020). Having an accreditation may also improve medical professionals trust in ERSs and improve the clarity on the expected duties of each profession, helping to attenuate peer pressure from the organisation and other organisations (Reale et al., 2021).

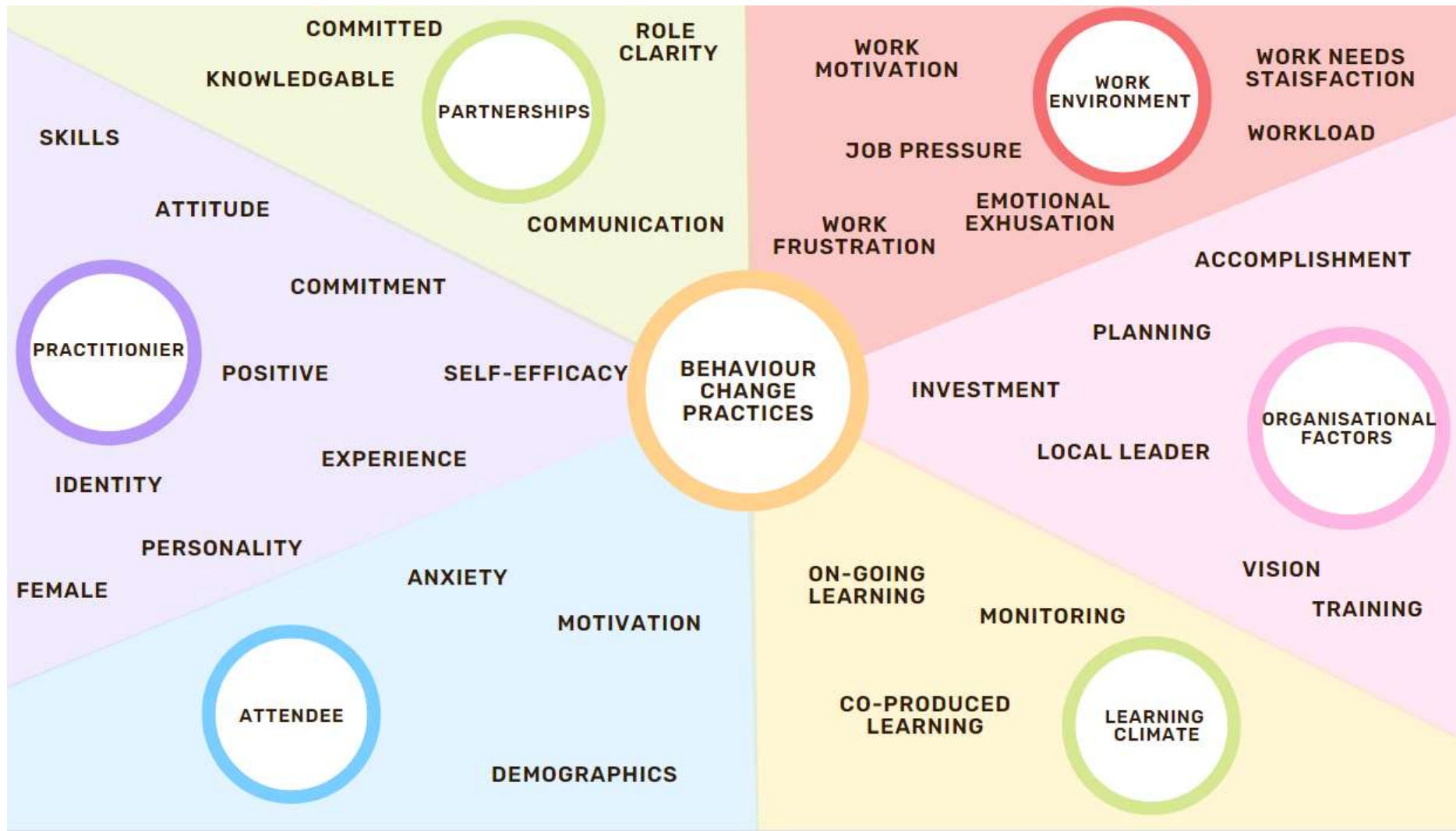


Figure 2.3. A visual representation of the narrative synthesis

2.8.3.3 Work Environment

The workload, job pressure, levels of emotional exhaustion, work needs satisfaction, and type of practitioner motivation (intrinsic/extrinsic) were all linked to the implementation of behaviour change practices. The body of work exploring these relationships utilised the Self Determination Theory to unpin data collection and assumed that where the work environment can attend to a human's basic needs of autonomy, competence, and relatedness, motivation will become more internalised and sustainable (see Deci & Ryan, 2000).

Where practitioners perceived the work environment to be needs supportive emotional exhaustion was decreased, feelings of personal accomplishment were increased, and the implementation of behaviour change practices were more likely (Sánchez-Oliva et al., 2021; Silva et al., 2017). Opportunities to contribute to the organisational agenda and decision making, continuing professional development, and feeling heard, were common ways needs satisfaction was achieved (Silva et al., 2017). Likewise, where practitioners were supported through financial incentives, meetings, and training it provided the opportunity to experience implementation in practice and internalise motivation, leading to continued implementation (Hoekstra et al., 2021). Conversely, needs frustration independently decreased autonomous motivation, feelings of accomplishment, and the implementation of behaviour changes practices (Silva et al., 2017). Personal accomplishment was shown to be a mediator for needs satisfaction (Raposo et al., 2020) and emotional exhaustion was linked with poor implementation of behaviour change practices (Silva et al., 2017). It is also noted that behaviour change practice is emotionally taxing and fatigue may influence the quality of practice (Dineen et al., 2022). This was corroborated elsewhere, where a high workload, overrunning consultations, and working beyond capacity increased stress (Dineen et al., 2022). In combination with the taxing nature of the role, where the organisation is controlling and practitioners feel powerless, emotional exhaustion is magnified and autonomous motivation decreases (Raposo et al., 2020; Silva et al., 2017). The level of job pressure was also linked to needs frustration and poor implementation outcomes (Sánchez-Oliva et al., 2021). The workload, measured in hours per hour, showed a relationship with implementation outcomes. Practitioners who worked greater than 20 hours a week were less likely to employ behaviour change practices (Sánchez-Oliva et al., 2021).

2.8.3.4 Organisational Factors

The organisation setting in which a practitioner works had a critical role to support implementation outcomes through practical and cultural influences. The providers of ERSs must invest, and provide sustainable investment, to increase penetration and the continuation of behaviour change practice (Hoekstra, et al., 2017b; Purdy et al., 2022; Smith et al., 2021). In one paper it noted a tension between prioritising implementation outcomes or cost effectiveness. The authors found organisations who prioritised cost effectiveness had lower implementation trajectories and showed the greatest improvement over time, but earlier adopters, focusing on implementation, had the highest level of adoption (Hoekstra, et al., 2017b).

Practitioners can also be incentivised to implement behaviour change practice (Hoekstra, et al., 2017a; Hoekstra, et al., 2017b), however, some authors raise concern about the use of incentives. Where reimbursements are used, it could lead to practitioners using a written prescription alone to maximise personal incentives, meaning the actual implementation of behaviour change decreases (Gustavsson et al., 2018).

Where the organisation undertook an inclusive planning process, with practitioners and other key stakeholders, it increased awareness, importance, needs satisfaction of staff, and produced an intervention which met the needs of the attendees and employees (Buckley et al., 2018; Dineen et al., 2022). Structured sessions which provided sufficient time to build connection with attendees was perceived as useful and enjoyable by practitioners (Dineen et al., 2022). When the core elements of the programme were made explicit it supported practitioners to adapt non-essential aspects and retain essential behaviour change elements (Purdy et al., 2022). Likewise, when the intervention was positioned in an integrated organisation it provided authentication of practitioners within a multidisciplinary team (Hoekstra, et al., 2017b).

Organisational logistics also set expectations and service norms, which directly influenced the work environment (see previous section) and implementation outcomes (Raposo et al., 2020; Smith et al., 2021). Organisations can support implementation, and practice norms, by creating accessible policies and practice guidelines. There also needs to be ongoing communication about updates and support on how to convert

guidelines into practice (Gustavsson et al., 2018; Reale et al., 2021). Increased options for attendees must be congruent with the behaviour change policies, as gym settings, and limited choice for attendees decreased adherence and made implementation more difficult (Carr et al., 2021; Shore et al., 2022).

The perceived role of training to support the implementation of behaviour change practices was widespread (Buckley et al., 2018; Carr et al., 2021; Czosnek et al., 2021; Dineen, et al., 2021b; Gagnon et al., 2018; Gustavsson et al., 2018; Hoekstra et al., 2021; Hoekstra, et al., 2017b; Moore et al., 2012; O'Shea et al., 2016; Reale et al., 2021; Smith et al., 2021). Importantly, ongoing training was seen to provide a road map for practice, enhance skill development, provide foundational knowledge, alter attitudes, and decrease drift/decay. The provision of training ranged from hours to university courses, and the typical requirement of two days training was seen as inadequate to support implementation (Moore et al., 2012). Hoekstra and colleagues (2021), draw attention to their training, where 78% of the cohort thought the training was essential for implementation. The authors highlighted how their approach was uncommon as it involved 24 hours of contact time, expert support, refresher training, and access to a learning platform (Hoekstra et al., 2017b).

The current understanding of the training provided to ERS practitioners is underexplored, creating a gap in the literature (Quested et al., 2017; Shore et al., 2021; Wurz et al., 2021). Furthermore, the current exercise qualifications do not equip practitioners to undertake behaviour change practices, potentially explained by the medicalisation of ERSs (Gustavsson et al., 2018; Reale et al., 2021). The current paradigm within industry attempts to upskill practitioners to employ a medical view of ERS, however, it is known that practitioners do not respond well, and score poorly, in this domain (Stacey et al., 2010). It has been shown that practitioners do not value or integrate knowledge through a medical lens and there is a need for organisations to provide expert guidance, self-reflection, refreshers, peer support, and rehearsal of skills to overcome the industry drawbacks (Gray, 2019; Moore et al., 2012; Reale et al., 2021; Stacey et al., 2010).

The presence, and support, of local management influences the implementation of behaviour change practices in ERSs. Local leadership engagement can support implementation by providing expert advice and peer support, championing behaviour

change in decision making, allocating resources, responding to local issues, monitoring and feedbacking about practice, and attending to logistics (Carr et al., 2021b; Dineen et al., 2022; Gustavsson et al., 2018; Hoekstra, et al., 2017b; Moore et al., 2012; Raposo et al., 2020). Local leaders need to be credible, respected, have influence on senior management, and have the capacity to undertake implementation planning (Dineen et al., 2022). The influence of the local leader was tangible in the work of Moore et al. (2012), who demonstrated that when local leaders did not discuss behaviour change practices, the practitioners expressed negative views about the integration of MI with usual care. Local leaders can endorse behaviour change practices which increases the level of importance within the workforce and subsequent implementation (Gustavsson et al., 2018). The quality of relationships, feeling of support and personal capability, spread of workforce champions, expectations, and communication of updates about practice are under the direct control of the local leader. These factors can increase the implementation of behaviour change practices by ERS practitioners (Dineen et al., 2022; Gustavsson et al., 2018; Hoekstra, et al., 2017b; Raposo et al., 2020).

A central issue in ERSs is the current culture which does not prioritise the implementation of behaviour change practices and there is need for a culture shift (Buckley et al., 2018; Dineen et al., 2022; Duda et al., 2014; Gray, 2019; Gustavsson et al., 2018; Hoekstra, et al., 2017a; Hoekstra, et al., 2017b; Moore et al., 2012; Raposo et al., 2020; Shore et al., 2022). Implementation was higher in organisations that had an explicit vision and strategy to support implementation. It is suggested that local commitment contextualises the innovation and allows local procedures to align with the vision (Hoekstra et al., 2017a). In Dineen and colleagues work (2022) open, inclusive, and iterative pre-panning with stakeholders provided a platform to emphasise the need for implementation, ongoing support, and training. This communication provided a culture spread, as subsequently organisations trained all staff to be ERS employees and created a national community of practice within the organisation. Currently, consultations are usually seen as solely about data collection and practitioners perceive an incongruence between the medical structure of consultations, and good behaviour change practices (Buckley et al., 2018; Moore et al., 2012). Where the organisation vision creates alignment with behaviour change practice, it facilitates intensification of practice whereas the use of controlling practices

by the organisation creates a precedent, and practitioners treat attendees in the same way (Raposo et al., 2020).

2.8.3.5 Partnerships

The partnership between the exercise and medical professions was a consistent theme across the literature purported to support the implementation of behaviour change practices. Overt GP support is lacking, and primary care are unaware, or see no value in ERSs, yet communication and collaboration are important to provide local ownership of the scheme, shared advocacy, recognition and acceptance within the medical world (Caperchione et al., 2021; Hoekstra, et al., 2017b; Purdy et al., 2022). A committed and enthusiastic physician is important to champion behaviour change practices and augment current views of the schemes locally (Hoekstra et al., 2017b). It was also highlighted that GP support, and utilisation of behaviour change practices, provides credibility and ensures attendees are more receptive to behaviour change practices when they attend ERSs (Caperchione et al., 2021; Carr et al., 2021). Yet, there is a disjoint, and GPs often do not advocate or maximise ‘the teachable moment’ and often attendees do not experience a person centred experience and are not issued information about ERSs from the GP (Caperchione et al., 2021; Gustavsson et al., 2018). It has been shown the GPs think PA change is easier than other lifestyle modification, therefore, they may be unable to grasp the utility of ERSs (Gustavsson et al., 2018). This is also seen where practitioners had to ‘*sell exercise*’ as attendees came without any information about the scheme, hampering implementation of behaviour change practices (Shore et al., 2022, p.8). Physicians did not feel behaviour change is within their duty of care and the distinction between roles in ERSs is lacking (Caperchione et al., 2021; Gustavsson et al., 2018). There is a balance between placing undue burden on the medical profession and actively involving them in the service. It has been shown that smaller organisations are able to integrate with medics easier compared to larger, highlighting the importance of networking and the integration of services (Hoekstra et al., 2017a).

2.8.3.6 Learning Climate

Typical investment in evaluation and quality improvement is poor in ERS settings (Buckley et al., 2018; Lambert et al., 2017; Spence et al., 2022), however, the importance of ongoing formal and informal programme learning was highlighted as

fundamental for the implementation of behaviour change practices. Although there is crossover, several features of a learning climate were highlighted including, co-produced learning, monitoring, and ongoing learning. Creating a champion group who can involve all personnel in the planning and formative learning is essential as it provides multidirectional communication which is important for several reasons. Firstly, exercise practitioners utilise peers and networks as a primary source of knowledge accumulation (Stacey et al., 2010). Developing a co-learning climate is more appealing and acceptable than issuing academic information. Secondly, iterative planning with stakeholders increases engagement, critical thinking, problem solving, helps forge partnerships, generates ownership, and creates acceptable programme structure (Buckley et al., 2018; Dineen et al., 2022; Hoekstra et al., 2017a; Real et al., 2021; Smith et al., 2021; Wurz et al., 2021). Thirdly, behaviour change is not a formulaic practice, and data is lacking on the adaptations that are required in specific contexts (Carr et al., 2021; Czosnek et al., 2021; Hoekstra et al., 2017b), although monthly meetings, and a wider learning climate, provided the opportunity to increase system learning and practitioner motivation (Dineen et al., 2022). Ongoing meetings and communication were highlighted by authors to support sharing challenges, lessons learnt, and cementing the community of practice (Carr et al., 2021; Dineen et al., 2021; Hoekstra et al., 2017b; Wurz et al., 2021). Regular communication can also help negotiate a balance between professional agendas, where a shared understanding of the programme can be decided (Grimmett et al., 2021).

Explicit monitoring has a dual purpose to support implementation by helping to accumulate evidence engendering greater confidence and subsequent investment in ERSs (Gustavsson et al., 2018; Purdy et al., 2022), and reinforcing practitioner behaviour. The periodic evaluation of practice, expert observation (via shadowing or through a sample of videoing consultations), peer support, rehearsal, and access to learning materials were deemed beneficial for implementation (Beck et al., 2016; Dineen et al., 2021a; Gagnon et al., 2018; Hoekstra et al., 2017b; Shore et al., 2022; Wurz et al., 2021). Formative evaluation and feedback improve memory and stimulate reflection postulated to enhance behaviour change implementation and the presence of programme manuals/booklets were also seen as a useful aid to enhance delivery, break down attendee barriers, contextualise practice, and guide behaviour change practice (Caperchione et al., 2021; Carr et al., 2021; Dineen et al., 2021b; Gustavsson

et al., 2018; Hoekstra et al., 2017a; O'Shea et al., 2016). A commitment to self-reflection and access to expert guidance is paramount and observations and feedback were envisaged to increase self-efficacy and skill development (Gustavsson et al., 2018; Moore et al., 2012; Smith et al., 2021).

2.9 The Gap in the Literature

Although behavioural science is acknowledged as fundamental in ERSs there is a paucity of research exploring the implementation of these practices. Literature continues to privilege testing the efficacy of exercise prescription and the associated physiological outcomes, ignoring the role of behavioural science (Grimmett et al., 2021). The predictors of behaviour change practice in ERS practitioners are largely unknown, illustrated by the lack of retrieved citations during the current initial electronic database search. The dominant biomedical paradigm is incongruent with the implementation of behaviour change practices and has implications for training, culture, evaluation, funding, and attendee satisfaction. Attendees seek a humanistic experience with the opportunity for holistic development which contrasts with the current nature of practice and research (Gray, 2019).

Quested et al. (2017) highlighted a similar issue with retrieving implementation focused ERS research showing that less than 5% of retrieved manuscripts discussed implementation and behaviour change in their title, abstract, and keywords. A more recent paper identified no manuscripts that monitored programme adoption, adaptation, or the reasons for local innovation in relation to the implementation of behaviour change practices (Czosnek et al., 2021), stressing the need to undertake research to fill this research gap. Not surprisingly the broader search employed in the current narrative review, to increase the potential to unearth prudent citations, yielded mostly experimental or systematic review manuscripts. Despite all the included manuscripts having a component of behaviour change in their title, most of the reviewed manuscripts provided no information about the translation of intervention protocols to practice, or data on the implementation process.

A small body of work included in the narrative review did explore the predictors, barriers, and facilitators of behaviour change implementation, although the established literature has several limitations. There is an artificial view on what behaviour change practice entails and many conceptualise practice as a list of pre-set techniques. Others

use vague terminology like *'counselling'*, *'motivation strategies'* or *'education'* which conflates practice in naturalistic settings. Lastly, the measurement of behaviour change practice is either self-reported, measured on a binary assessment, or through staff documentation about deviations from expected practice (see above).

Where data exploring impediments to the implementation of behaviour change was available, many of the cross sectional surveys are limited by the use of pre-selected variables which focused solely on needs satisfaction and the work environment (Raposo et al., 2020; Sánchez-Oliva et al., 2021; Silva et al., 2017). The manuscripts provided useful information about the relationships of the pre-selected variables and self-reported behaviour change practices, however, they are unable to account for potential hidden causal factors. The measurement of implementation used in these surveys is a reflection on what practitioners envisage they do, instead of capturing their cognitive decision making or responses to naturalistic settings.

A separate issue is the diverse settings noted within the narrative review and several of the manuscripts providing information on factors influencing implementation had a low ecological validity. Many of the manuscripts involved physiotherapists, were integrated into a medical environment, or carried out intense research trials which were not typical of routine ERSs. Extensive co-produced research planning, funding, and academic support may augment the contextual factors which is not recognised in the publications. There is a lack of research providing information about the influence of contextual factors in naturalistic settings.

The review did collate a menu of factors that influence the implementation of behaviour change factors across the domains of attendee characteristics, practitioner characteristics, work environment, organisational factors, partnerships, and learning climate. The current narrative synthesis also drew connections across these domains; however, no researchers have explored the mechanisms that influence the use of behaviour change practices in ERS practitioners. Two citations stress the need to identify the determinants of practitioner behaviour to support implementation further justifying the need to undertake the current body of research (Carr et al., 2021; Reale et al., 2021). Carr and colleagues (2021) also discuss the need to test the programme's envisaged theory of action; however, they do not evidence how context shaped or refined the envisaged theory of action. At the time of writing this thesis it

has not been possible to uncover any research that has explored how contexts interact with the implementation process and the factors which drive or suppress the implementation of behaviour change practice in ERSs.

2.10 Chapter Conclusion

The narrative review aimed to provide a critical integrative account of the field, examining the factors that influence the implementation of behaviour change practices in ERSs. The field is hampered by a lack of implementation focused research examining the factors which drive or impinge implementation. A biomedical lens dominates, and research largely assumes the standardisation of practice and a pipeline implementation of behaviour change practices. Where implementation research is encouraged, it mostly retains the biomedical lens and implementation research is encouraged to examine the reach, dose, fidelity, and changes to attendee outcomes which cannot explain how implementation occurs. There was a minority of authors who recognised that the implementation of behaviour change is complex, and practice involves more than a set of techniques or pre-set checklist. Yet, the measurement of practice is poor and rarely involves naturalistic settings or theorising the impact of contextual factors triggering changes to practitioner's motivation or capability.

Despite this, a menu of factors which influence implementation were synthesised from reviewing the nascent literature which provides a descriptive overview of how the implementation of behaviour change practices in ERS may be influenced. Although connections were drawn in an informal way (e.g. from direct quotes noted in manuscripts), there was no evidence which developed and tested how the factors interact. Nonetheless, the narrative review shows that implementation is more likely when the following factors exist:

- partnerships are established with committed, knowledgeable, and well networked physicians
- practitioners are female and are committed, positive, enthusiastic, skilled, experienced, and have positive attitudes towards behaviour change practices
- attendees arrive to schemes less anxious, more motivated, and come from a more educated and affluent background supported by their GP

- the work environment increases autonomous work motivation, does not overload practitioners or cause emotional exhaustion and provides opportunities for personal accomplishment
- the organisation supports implementation through ongoing training, collaborative planning, investment and sets norms through the organisational vision
- the learning climate is conducive to behaviour change where ongoing support for skill development, clear evaluation monitoring and formative feedback, and co-produced peer learning is available.

The following chapter details the approach adopted in this thesis to attend to the limitations highlighted in the narrative review. A congruent paradigm to advance the field, and answer the research question, is realism. Chapter 3 outlines the specific realist assumptions adopted and the foundational ontological and epistemological beliefs which shaped the thesis. The implications of the paradigm assumptions, their fit within the thesis design, and how the research question was answered are also illustrated in the following chapter.

Chapter 3: Methodology and Approach

3.1 Chapter Overview

This chapter describes the philosophical orientation of the research and the methodological approaches applied to answer the research question. Initially, the need for innovative implementation research is explained providing a background, and rationale, for the approach adopted. The chapter then explains realist approaches to research, focusing on central assumptions of ontology and epistemology. Realist evaluation, as one approach to operationalise innovations in implementation science, is then discussed. The research design for this thesis, and the congruence with the chosen paradigm, are presented to demonstrate how the research approach can answer how, why, and in what circumstances behaviour change practices are implemented by ERS practitioners. Lastly, a reflexive account on how my own presuppositions may have influenced the research, at various stages, is presented and the processes utilised to attempt to suspend these impositions is discussed.

3.2 Chapter Introduction

It is widely acknowledged that the implementation of evidence/policy is fraught with challenges as good practice involves the use of objective science, but also contextual judgement, innovation, and being attentive to the experience of the attendee (Greenhalgh, 2018). Acknowledging the importance of local adaptation challenges traditional ideas about the faithful fidelity to a treatment protocol typical in implementation science (Braithwaite et al., 2018). Contemporary discourse proposes that implementation is influenced by competing agendas, historical cultural norms, human interpretation, personal values and austerity, amongst other things (Sarkies et al., 2022). Implementation, in the case of this thesis behaviour change practices, therefore resides in the processes of change by which practitioners interact with contextual factors, which should be the focal point of implementation research (Hawe et al., 2015). Traditional research approaches in implementation science are impinged by their reductionist origins and, despite calls for innovative methods (Kislov, 2019; Wensing et al., 2020), implementation science largely values greater accuracy in fidelity measurement, increased scaling up of standardised practices, and a reliance on experimentation (Movsisyan et al., 2019; Murphy et al., 2022; Skivington et al.,

2021). Specifically in behavioural science it is assumed that once a practitioner adheres to a treatment protocol planned BCTs will augment specific psychosocial mediators in a linear, constant, and predictable fashion, which ignores the contingencies, fluctuations, and trade-offs that dictate practitioner, and attendee, behaviour (Heino et al., 2021; Zywert & Quilley, 2018). Subsequently, there are gaps in the implementation literature pertaining to how context, and the processes that underpin implementation attempts in naturalistic settings, influence outcomes (Dryden-Palmer et al., 2020; Kislov, 2019; Nilsen et al., 2022; Rogers et al., 2020).

As outlined in Chapter 1 the implementation of behaviour change practices are a constituent of a complex adaptive system which possess interdependencies, meaning discrete components of the practice setting are more than the sum of their parts (Braithwaite et al., 2018; Cribb et al., 2022; Papoutsi et al., 2020). Nevertheless, the current literature overemphasises pipeline thinking (Klepac Pogrmilovic et al., 2021), and interventions trying to support implementation have shown unimpressive effects (Lau et al., 2015), as they fail to consider the range of factors that may exert influence on implementation behaviour. For example, the use of a brief training course in ERS practitioners, which upskills the workforce, is ignorant to the type and volume of demands placed on them in routine practice, or their own valued priorities in practice (Moore et al., 2013). Interestingly, in implementation generally, there is limited work describing and targeting contextual aspects of implementation (Lau et al., 2015; Pereira et al., 2022; Sarkies et al., 2022).

To advance implementation science research approaches are needed to explain the human and environmental contexts where evidence uptake is expected to take place (Davidoff, 2019). There is a need to move from acknowledging the importance of context to explaining how elements of context influence implementation behaviour (Dryden-Palmer et al., 2020; Nilsen & Bernhardsson, 2019). Implementation frameworks help navigate the salient factors in implementation attempts, however, frameworks do not conceptualise context in a coherent and consistent manner (Nilsen & Bernhardsson, 2019; Pfadenhauer et al., 2017). There is a need to produce testable ideas to guide empirical enquiry and bridge the gap between frameworks and empirical observations. Implementation frameworks catalogue prudent factors for implementation, but they are not polished products and there is a need to operationalise implementation theory and advance knowledge through empirical

'verification, refinement and consolidation' with those who have experiences of the implementation processes (Kislov et al., 2019, p.6).

3.3 Scientific Realism: Ontology and Epistemology

The philosophical stance guiding the thesis aligns with realism, specifically scientific realism, which borrows principles from various camps of realist scholars (Pawson, 2013). A central feature of realism is the separation of ontology and epistemology, thus, what is real (ontology) is not limited to what can be known (epistemology) (Fletcher, 2017). Ontologically, realism shares a positivist standpoint which espouses that reality exists independent of human knowledge and/or observation. Epistemologically, realism adopts an interpretive lens as human knowledge of reality is fallible and theory laden; although interpretations can undergo empirical enquiry to move closer to reality (Easton, 2010). For realists, the world possesses real entities that exist despite our observations and interpretations of them and the pursuit of these objective entities will always be fallible as accounts of reality are mediated through filters (e.g. meanings, language, social context) (Oliver, 2012). The implication of the foundational ideas about reality means the aspiration is to move beyond the observable and use causal language to explain the world (Easton, 2010; Parra et al., 2021). Realism departs with constructivism by assuming that reality consists of more than human knowledge and that some accounts are closer to reality (Pawson, 2013). Realism is also post-positivist as it rejects naïve ideas about universal truths, deterministic laws, and generalisability (Danermark et al., 2002).

Pawson's scientific realism retains the foundational metatheoretical ideas of Roy Bhaskar's work on critical realism but also includes notable differences (Pawson, 2013). Pawson (1989) argues that critical realism was developed as an antidote to positivist thinking and therefore lacks practical application. The central thesis of Pawson's argument is that *'Bhaskar was a philosopher, writing for philosophers about philosophy'* (Pawson, 2016, p.49). In contesting the utility of critical realism, Pawson notes that critical realism is *'no use whatsoever in applied social inquiry'* (Pawson, 2013, p. 71). Others note that critical realist literature has been philosophical, and the methodological development, and application in applied research, has been limited (see Fletcher, 2017). Critical realist scholars agree that the ontological framework does not transition easily into applied research (Carter & New, 2004). Although the

writing of Pawson may be purposefully provocative, and debate on how critical realism and scientific realism differ philosophically and methodologically is contested (Danermark et al., 2002; Pawson, 2016; Porter, 2015a, 2015b), it is beyond the scope of the thesis to unpack the philosophical similarities and differences. Importantly for this thesis, Pawson argues for a pragmatic, tentative, and fallible approach that borrows elements of theory driven evaluation (Pawson, 2013). Pawson suggests the philosophical ideas of critical realism, namely the impossibility to close a social environment for experimentation, creates the situation where critical realists can use '*normative assertion*' and '*metatheoretical thrusts*' as a mode of empirical enquiry (Pawson, 2013, p. 61; Pawson, 2016). Alternatively, Pawson argues for a piecemeal '*slow confederation of evidence drawn from practically closed systems*' (Pawson, 2013, p. 70). The assumptions which underpin realist work are depth ontology, generative causation, and specific modes of theorising, which will now be explained in more detail, emphasising how these tenets help answer the specific research question of this thesis.

3.3.1 Depth Ontology and Generative Causation

For realist research to be intelligible, a distinction must be made about the transitive and intransitive dimensions of knowledge. The transitive dimension of knowledge includes the discourses and hunches adopted to explain the intransitive dimension. Transitive knowledge is therefore contested and changeable because of human interpretation, whereas the intransitive objects of interest remain relatively stable (Lusted, 2018). If facets of reality exist beyond human comprehension, and reality is fragmented, it compels the researcher to appreciate, and theorise, how underlying structures shape phenomena that can be observed (Wiltshire, 2018). In the current thesis the interest is on not only if ERS practitioners use behaviours change practices but how, why, and in which circumstances implementation occurs. A realist framing privileges not just patterns of outcomes, but the process of utilising practitioners to provide transitive knowledge about the underlying causal powers in the intransitive dimension to explain patterns that are readily observable. This attends to the call for greater context specific research that explains how practitioner implementation behaviour is influenced (Ataman et al., 2022; Sarkies et al., 2022).

Realism proposes that reality can be separated into progressively basic layers which provides an ontological map guiding scientific enquiry and facilitating the investigation of relationships between what we experience, what actually happens and the causal forces that produce outcomes (Bhaskar, 1979). The empirical realm accounts for phenomena that can be experienced, which is subject to human interpretation; the actual realm is void of human construction and relates to how things occur regardless of human interpretation; and the real domain concerns the causal powers and liabilities of entities which may or may be not realised or perceived contingently determined by the conditions they operate within (Danermark et al., 2002). Figure 3.1 provides a hypothetical example of the stratified ontology that may exist within the implementation of behaviour change practices in ERSs.

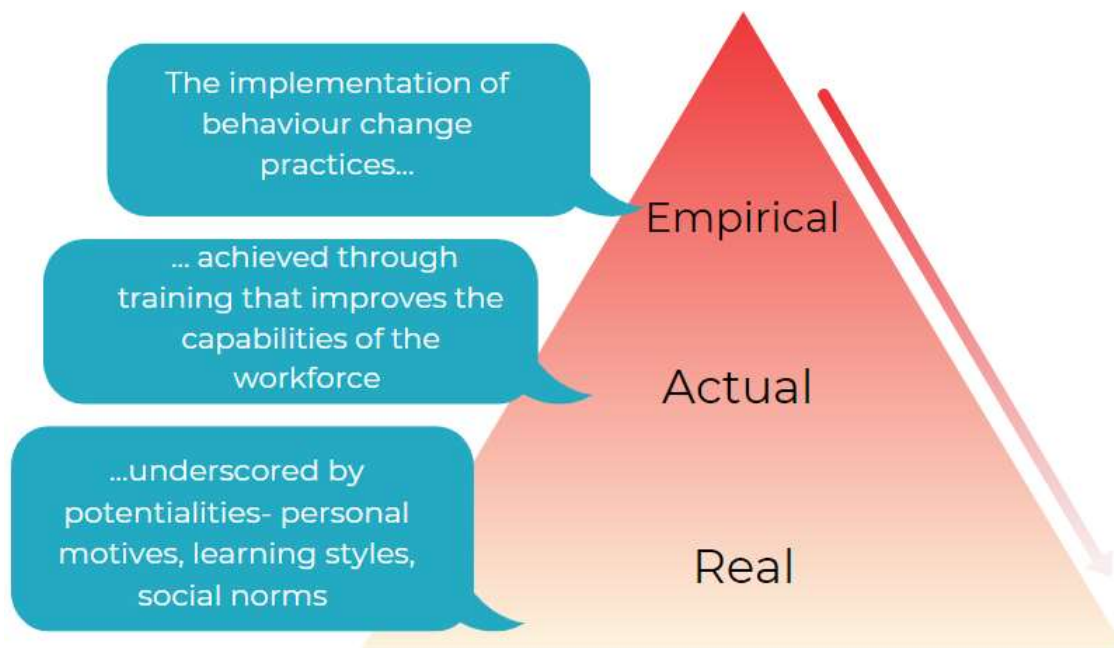


Figure 3.1. An example of how the realist philosophy is applied to the implementation of behaviour change practice in ERSs

By acknowledging the influence of the unobservable on events, the interest becomes what must exist for events to occur as they do (Porter, 1996). Generative causation is the term used in realism that refutes linear, deterministic, and successionist notions of causality (see Pawson, 1989) (Figure 3.2). The tiggering of underlying, invisible, internal powers which brings about specific observable events is the focal point of

realist enquiry, and the label 'mechanism' is used to describe the processes which drive outcomes (Pawson, 1989). A mechanism is not an intervention component, but the potentialities of the system and responses to specific resources or structures (Van Belle et al., 2016). Assuming generative causation requires the researcher to unpick, and theorise the composite parts of phenomena, the existence of demi-regularities of those parts, and undertake empirical evidence to propose bold conjectures to explain '*apparent uniformities*' and falsify theory in an iterative manner (Pawson, 2013, p.9).

The focus of the forthcoming body of research in this thesis is on the implementation behaviour of ERS practitioners. Although it is noted that universal structural mechanisms, and forces high in the implementation chain, will interact with, and augment, practitioner behaviour (Greenhalgh & Manzano, 2021); the current research aims to advance knowledge about the implementation process, and the contextual factors that trigger individual mechanisms (Van Belle, et al., 2017). Fundamentally the implementation of behaviour change practices will rely on the perceptions and cognitive biases of practitioners which cannot be predicted a priori but are paramount to success (Greenhalgh, 2018; Liu, et al., 2018). Exercise practitioners are not passive recipients of ERS guidance and their practice will be dictated by sensemaking and responses to specific conditions (Greenhalgh, 2018). This strengthens the argument to theorise the mechanisms, and contingent conditions, which manifest outcomes which are observable.

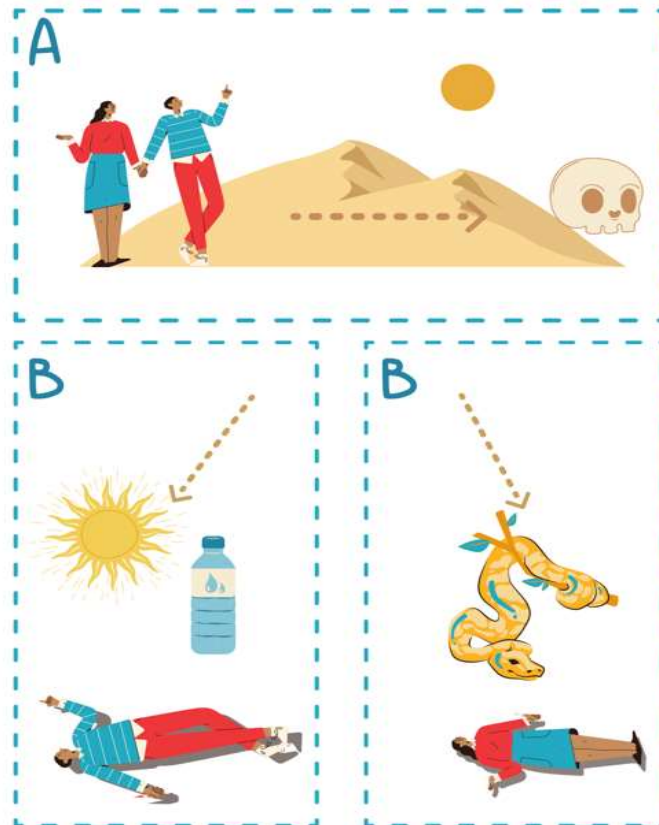


Figure 3.2. An illustration of a (a) successionist and (b) generative perspective of causality (adapted from Befani, 2012)

- a) Represents a successionist view of causality. It is observed that walking in a desert is followed by death. This is routinely demonstrated, showing that walking in the desert causes death, but there is no exploration on what part of the walk leads to death
- b) Represents a generative view of causality. Two separate conditions trigger different causes of death. The two people take separate routes, one is exposed to extreme heat leading to death by thirst and the other takes refuge under a tree where a snake resides, and they die by poisoning.

3.3.2 Theorising and Modes of Inference

Assuming there are hidden mechanisms, and aspiring to understand how they produce outcomes, requires an apparatus to make claims about phenomena. The use of theorising in realism provides the platform to generate ideas about experiences which approximate the real and the actual domains (Lusted, 2018). The aspiration is to unearth the essential conditions for a particular mechanism to manifest in the observable realm (Fletcher, 2017). Essentially, researchers engage in thought experiments to explore what must be true for X to exist (Oliver, 2012).

Within scientific realism, programme theories are the unique, practical, and accessible causal ideas postulating how outcomes are generated (Davidoff et al., 2015). Programme theories are usually disparate so to capture the complexity of programme theories there is a need to populate them with a core set of processes, and previous conceptual platforms can be recycled (Pawson, 2013). Realism assumes that there are no universal laws but that nothing is entirely new, and utilising established conceptual frameworks can erect boundaries and arrange the phenomena under investigation (Rycroft-Malone et al., 2013). By utilising conceptual frameworks it provides an overview which describes relevant dimensions, concepts, and reoccurring themes within implementation (Nilsen, 2015; Pawson, 2013; Rycroft-Malone et al., 2013). Yet, the central endeavour in realist enquiry is the linkage of concepts, and generation of fallible hypotheses, about causation. The use of theoretical frameworks can highlight key explanatory pathways that are likely to operate within the conceptual platform (Davidoff, 2019; Shearn et al., 2017). Employing theoretical frameworks also subjects theory to refinement in context, as empirical testing with those who have detailed experiences with the phenomena of interest provide granular feedback on theory in action (Westhorp, 2012). In the case of this research, conceptual frameworks illuminate the components of the implementation sphere and theories '*identify which interactions matter for generating outcomes*' which guides data collection and theory refinement (Westhorp, 2012, p.410).

A central strategy to achieve '*theory driven empirical inquiry*', popularised by Robert Merton, is middle range theorising (Pawson, 2000). Middle range theory adopts a level of explanation that is intermediate. It involves conceptualising social phenomena at a level that encompasses a wide sphere of behaviour, so the theory is not restricted to

its area of formulation, but not too abstract that it suggests complete generalisation (Cartwright, 2020). Middle range theorising provides a platform to simultaneously abstract from evidence to theory, and return to the concrete explanations from theory, helping to discern priority mechanisms (Astbury, 2018). The iterative process enables the consolidation of diverse concepts noted within data by borrowing, adding to, and passing on explanatory ideas (Pawson, 2000). This is pertinent to implementation research as there is copious unstructured data that explains implementation but generally there is a lack of analytic research (Liu et al., 2018; Shankardass et al., 2018). Depth ontology directs the gaze on how context interacts with underlying, and familiar theoretical constructs, which can be recycled and accumulated across disciplines and settings (Pawson, 2000).

Unlike exclusively inductive or deductive approaches, which flatten ontology, realism demands retroduction as a mode of inference when theorising, which allows the researcher to develop knowledge of reality by moving beyond the empirical realm to develop an understanding of the concepts and conditions necessary for events to take place (Danermark et al., 2002). Retroduction involves inductive, deductive, and abductive reasoning (Mukumbang, 2021). This compels the researchers to search below, before, and behind observed patterns to postulate what generates them. The process by which observations are re-described, utilising theoretical labels, is known as abduction (Danermark et al., 2002). Through abduction, unstructured data and surprising empirical findings can be reinterpreted as something else, providing new ideas about how individual phenomena are part of general structures (Danermark, et al., 2002). In retroduction there is an attempt to outline what is constitutive of the structures and their causal processes (Decoteau, 2017).

3.4 Realist Evaluation

Realist evaluation is a form of theory driven evaluation that adopts the hallmark of realist enquiry to peruse generative causation (Marchal et al., 2012). Realist evaluation starts with theory and ends with theory (Pawson, 2013), as assumptions about how implementation of behaviour change practices will always be subject to refinement in other settings. In realist evaluation, programme theory is initially generated through intensive methods, which align with qualitative approaches, to unearth social action within specific settings helping to postulate how causal powers manifest, and the

conditions that catalyse outcomes (Danermark et al., 2002; Lusted, 2018). It is then encouraged to employ mixed methods for theory testing, using extensive or quantitative, methods to explain the regularities and patterns in the empirical realm while subjecting the qualitative explanatory theories for appraisal (Danermark et al., 2002; Lusted, 2018; Mukumbang, 2021).

Within realist evaluation, context is a broad term that relates to the outstanding conditions which interact with underlying powers allowing observable outcomes to manifest. Realist evaluators map the complexity of an area of interest, using previous conceptual frameworks, which helps prioritise prudent areas to answer specific research questions (Ebenso et al., 2019; Pawson, 2016). This creates implications for the current research, namely perusing actor engagement to solicit the knowledge and the perceptions of individuals' which can unearth priority areas and engagement with the implementation process (Parker et al., 2021). Realist evaluation's ambition is to explain the relationship between outcomes, contexts, and responses to resources (Pawson, 2013). The Context, Mechanism, Outcome (CMO) heuristic provides an analysis aid to configure theorising and explain how a specific context interacts with a mechanism, generating observable outcomes (Renmans, 2022). Realist evaluation focuses on programme evaluation, which privileges programme mechanisms as opposed to wider insights about social structures. This is pertinent in implementation science where practitioner reasoning is central to success, which realist evaluation has the capacity to explain (Blamey & Mackenzie, 2007). Realist evaluation conceptualises the mechanism at the level of human reasoning due to its preoccupation with local context, human volition, unintended consequences and the task of empirically adjudicating ideas to advance knowledge within complex systems (Dalkin et al., 2015). The use of middle range theorising, a staple in realistic evaluation, is advocated in implementation science to avoid the application of grand theories resulting in '*master schemes*' devoid of contemporary ideas about how local context shapes causal pathways (Kislov, 2019). Currently evaluation in implementation science is theory deficient and chaotic, creating a gap in the literature, which realist evaluation can attend to (Kislov et al., 2019; Sarkies et al., 2022; Van Belle et al., 2017). Figure 3.3 summarises the realist evaluation stages and the research design which will be unpacked in the following sections.

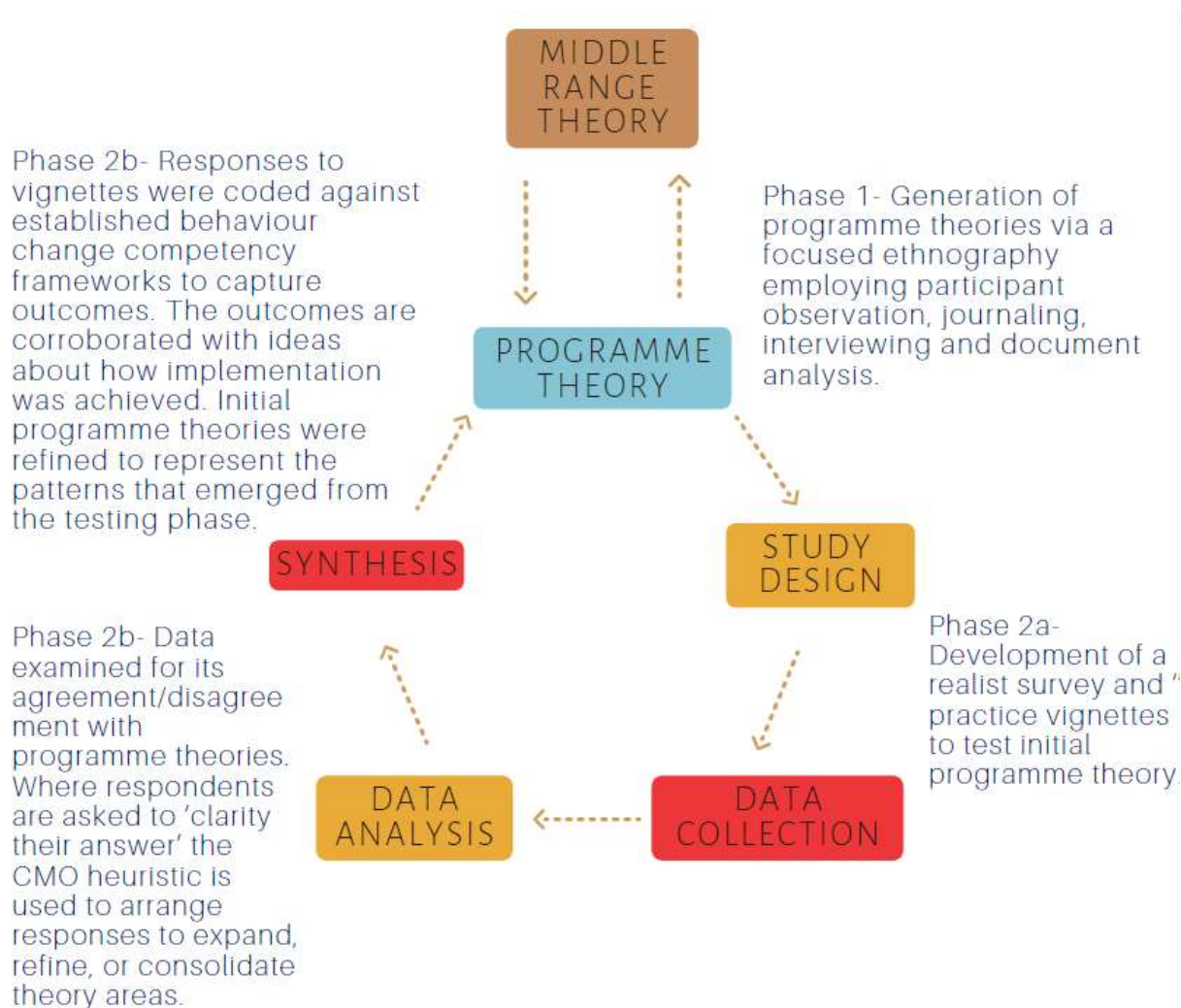


Figure 3.3 The research phases and design features for the upcoming systematic body of research

3.5 Choosing Reusable Frameworks

There is a recognition that theory should guide implementation evaluation (Ridde et al., 2020) which has led to an influx of implementation models with a substantial overlap of constructs (Birken et al., 2017; Nilsen, 2015; Rapport et al., 2017). Nevertheless, there is limited awareness about the utility of each framework and a lack of guidance on how to choose specific tools (Nilsen, 2015). Guidance on selecting implementation frameworks was lacking when the current research started. Table 3.1 provides the criteria that was used for framework selection, compared to subsequent guidance by realist (Shearn et al., 2017) and implementation (Birken et al., 2018) scholars. In brief, a conceptual framework was sought that was comprehensive,

usable, compatible with realism, and arranged in a manner that allowed the integration of theory to link varying levels and concepts. The following sections provide a detailed justification on how specific frameworks were selected. To reiterate, the task of choosing frameworks was interested in a conceptual model to provide a descriptive overview of salient concepts, relations, and components of the implementation sphere whereas the selection of theoretical models sought to provide an explanatory apparatus to link elements of the conceptual framework together (Nilsen, 2015).

Table 3.1. Comparison of criteria used to select implementation frameworks to the contemporary guidance (Birken et al., 2018; Shearn et al., 2017).

Criteria adopted	Criteria from subsequent publications
Large scope	Usability
Clear definitions	Testability
Accessible	Applicability
Compatibility with realism	Acceptability
Able to link to theory	Level of system zoom
	Combability

3.5.1 Conceptual Framework

Reflexive accounts of theory led evaluations in implementation science are lacking (Ridde, 2016) and the justification of framework selection is rarely outlined. The selection of implementation frameworks is usually implicit and based on popularity rather than relevance, meaning framework selection may not be optimal or even appropriate in some cases (Ridde et al., 2020).

Prior to developing programme theory there was a need to map the complexities of ERSs, therefore, a conceptual framework required a large scope to ensure sufficient scaffolding was present to describe social phenomena. The framework needed to be congruent with realist assumptions including the transient nature of context, an interest in configurational analysis, and emphasis on programme mechanisms. The conceptual framework also needed to be clear on its aim and be accessible, with clear definitions. Lastly, the conceptual framework required the ability to explain links across

the system, or be compatible with other theoretical models, to build specific middle range theories about causation.

In 2009, a determinant framework of key variables that influence implementation was created (Damschroder et al., 2009). The Consolidated Framework for Implementation Research (CFIR) reviewed multiple previous theories, and empirical studies, synthesising over 500 publications, to define the contextual factors that impact implementation. The CFIR has five domains covering inner and outer setting, the process of implementation, the intervention, and individual characteristics. The CFIR has 39 clearly defined concepts across the five domains (Damschroder et al., 2009).

The authors note that each contextual area may be transient and that the framework, although comprehensive, is not all encompassing and users of the CFIR are warned that emerging concepts within specific cases may be uncovered (Damschroder et al., 2022). Key considerations of the CFIR include the assumption that theory is piecemeal and needs refining in practice. The CFIR is a determinant framework and users must test theories that link determinants to outcomes (Kirk et al., 2016). Reflexivity should be applied to track all decisions about construct selection to rationalise and generate knowledge in context (Damschroder et al., 2009). Lastly, the authors of the CFIR welcome a pragmatic application of methods to test how outcomes are achieved in the presence of specific parts of the framework (Damschroder et al., 2022). These recommendations satisfied the criteria set for the current research. Namely it provided comprehensive structure and was multi-level, it welcomed emergence, it encouraged causal theorising, set a clear language to populate middle range theorising, and was accessible.

The CFIR is one of the most popular, and widely cited, frameworks in implementation science (Birken et al., 2017). The popularity of the CFIR is due to its role as a unifying tool of implementation and its accessibility (Kirk et al., 2016). Nevertheless, as discussed previously, it may be applied due to popularity, increasing the potential for inappropriate application. Subsequently, there is often a misuse, and partial application of the CFIR, violating the guidance by Damschroder and colleagues (Kirk et al., 2016). Other observations of note include the enduring positivism of implementation science, which contrasts with Damschroder and colleagues viewpoint (Damschroder, 2019). In addition, the breath, and assumptions of the CFIR, have

presented challenges for evaluators, due to the underlying views about complexity, and the abstract labelling of concepts leading to the simplification of the framework (Safaeinili et al., 2020; Jorgensonetal et a., 2022). In line with Damschroder and colleagues (2009), the CFIR was seen in this thesis as a fallible but comprehensive menu of potential determinants of implementation behaviour. It was adopted as it provides a scaffold that maps and helps navigate the terrain of implementation endeavours. Nevertheless, it is not complete, and only claims to provide a scaffold of factors with clear definitions which should be subject to empirical theorising and testing.

3.5.2 Theoretical Framework

The current thesis contextualised many of the concepts in the CFIR as an '*overarching typology*' of context (Damschroder et al., 2009, p.2). Any resources that the service provided/withheld were considered an element of a mechanism as outlined in the individual domain of the CFIR (Figure 3.3). There is a need to understand the mechanisms of implementation, which is still impinged by conceptual and methodological issues (Geng et al., 2022; Lewis et al., 2020). Linking concepts with causal thinking is not the purpose of the CFIR; therefore a combination of models was necessary for this thesis.

Adopting multiple models can limit the proliferation of new models and limit the overlap of constructs (Walshe, 2009), but there must be a clear rationale for combining models, which is lacking in implementation research (Birken et al., 2017). Like implementation frameworks, there is a lack of guidance for choosing theories to explain implementation behaviour (Davis et al., 2015). Social cognitive models are the dominant approach; however, social cognitive models have been critiqued for conflating behaviour to a rational and deliberate consideration of expectations underpinned by one's values (Kelly & Barker, 2016). Indeed, many practitioners decisions are underpinned by habit, as opposed to a conscious risk/ benefit analysis (Potthoff et al., 2018).

Realism's commitment to depth reality underscores the need to explain behaviour within specific contexts which social cognitive theories alone cannot accommodate (Sniehotta et al., 2017). The application of socioecological models, like the CFIR, is congruent with realist thinking, yet, the theoretical contribution of multifaceted models

of behaviour is underdeveloped (Rhodes, 2021; Rhodes et al., 2019; Rhodes et al., 2006). Social cognitive explanations are vast compared to understanding how context and various aspects of behaviour interlink. Therefore, the social cognitive factors still dominate, whereas a wider lens would allow for interconnecting aspects of influence across the multifactorial levels of behaviour. To acknowledge the complex factors impacting behaviour but retain the focus on mediating pathways for individuals within specific environments, a multi-level theory was utilised. Theories that appreciate multi levels of influence possess a strong evidence base for individual elements of behaviour, the ability to explore multi-level factors, and an applied toolkit for initiating change (Rhodes et al., 2019).

Of relevance for this thesis are the CFIR individual level constructs, due to the preoccupation with programme mechanisms, defined as a practitioner's change in reasoning based on specific resources (Dalkin et al., 2015). The CFIR individual level factors are, however, vague and lack a comprehensive elaboration. As the current study conceptualises implementation at the practitioner level, a clear definition of these terms was essential. The Theoretical Domains Framework (TDF) was developed for implementation science and validated 14 constructs from 33 behaviour change theories and 128 explanatory variables. Although multi-level, the TDF places greater emphasis on individual cognitions and automatic decision making (Cane et al., 2012), and therefore provides extended definitions of the CFIR individual domain. The reciprocal relationship of the TDF and CFIR lies in the breadth and depth of the combination (Birken et al., 2017) and authors have since identified the utility of the TDF to consider the interactions between behaviour and the multi-level structures that exert influence on outcomes (Etherington et al., 2020).

The TDF, however, does not possess an explanatory toolkit and only describes key concepts (Davis et al., 2015). Conversely, the aspiration of the current research was to explain the links across concepts, indicating a need for a theoretical infrastructure. The TDF has been developed into the Capability, Opportunity, Motivation, Behaviour model (COM-B) (Michie et al., 2011). The COM-B has since been defined as an implementation theory with a focus on explanation (Nilsen, 2015). The COM-B is a multi-level framework where the domains from the TDF are packaged into an explanatory label indicating how opportunity, motivation, and capability interlink (Rhodes et al., 2019). The CFIR extends the COM-B model by providing structured

and middle range contextual determinants in the '*environmental and resources*' domain of the TDF, as defined by Cane et al. (2012). Therefore, and in line with suggestion to justify the combination of the TDF and the CFIR (Birken et al., 2017), the TDF provided 1) nuanced descriptions of individual behaviour change constructs relevant to the thesis aims 2) provided a link to the COM-B to equip the research with an explanatory toolkit and 3) the CFIR expanded the TDF to provide well organised definitions of contextual determinants of implementation. Figure 3.3 outlines how the a priori frameworks provide a conceptual overview of the implementation sphere and an explanatory toolkit to undertake middle range theorising.

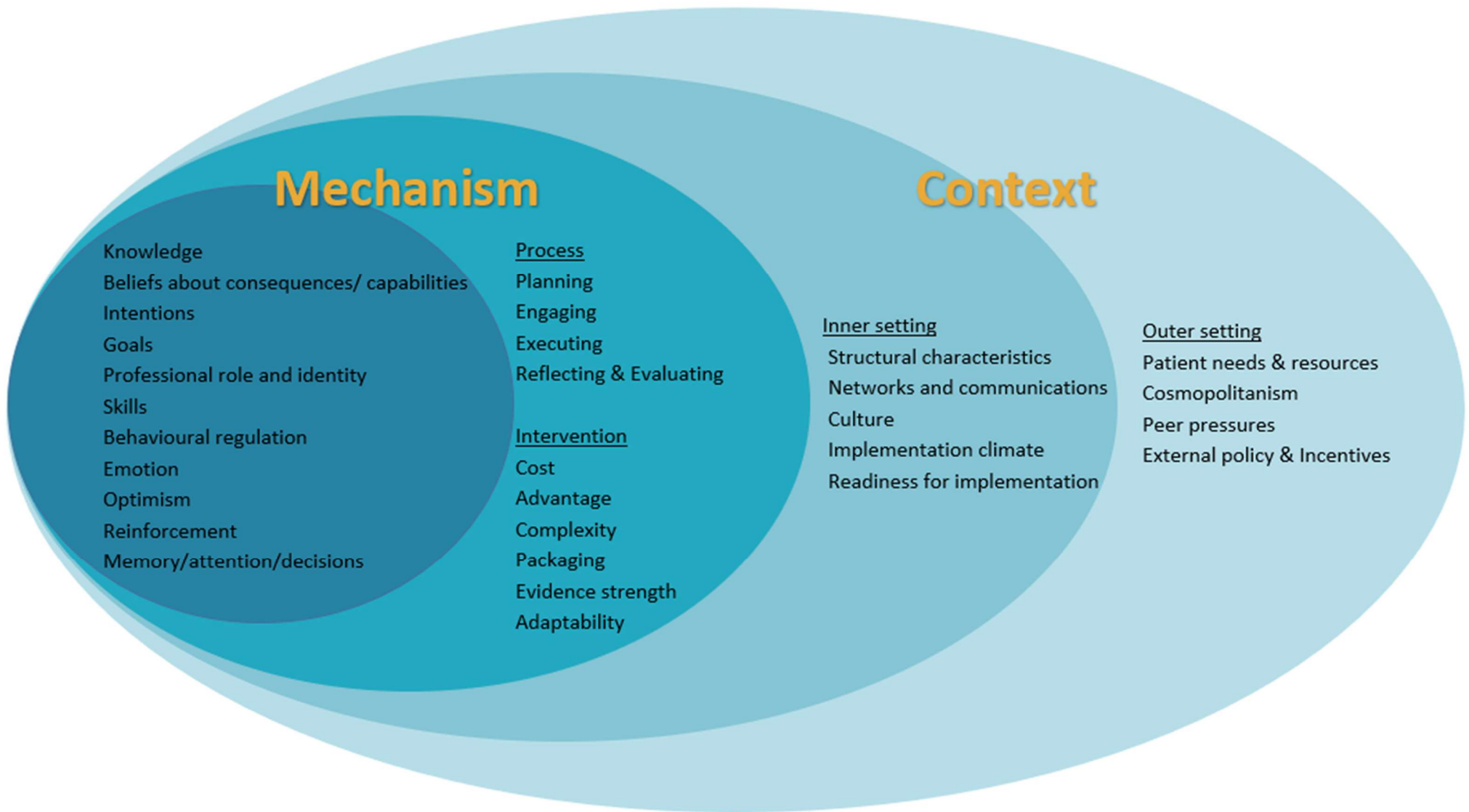


Figure 3.4. An outline of the conceptual framework domains, concepts, and extended TDF concepts within the individual domain

3.6 Focused Ethnography for Realist Theory Building

Ethnography is defined in a variety of ways but fundamentally it involves researching culture (Hammersley, 2018). The task is to document situations, behaviours, values, and beliefs, in a naturalistic setting, with the aim to unearth what is actually going on (Sparks, 1992). Despite conflicting conceptualisations of ethnography, common characteristics include the need for extended periods of data collection in naturalistic settings, multiple data collection methods, observation, acknowledging multiple realities, and holism (Hammersley, 2018).

Ethnography has been employed in a diverse manner, and through multiple paradigms (Krane & Baird, 2005), and the use of ethnography to study implementation has increased in recent years (Gertner et al., 2021). Commonly cited reasons for adopting ethnography in implementation science include researching intervention failure/success, the settings that influence implementation, and the interactions of complex adaptive systems (Collins et al., 2022; Gertner et al., 2021). Although ethnography is flexible, it possesses core beliefs including a rejection of value free interpretation, anti-positivism, induction, and a consideration of both structure and agency (Hammersley & Atkinson, 1995). These tenets are often implicit and the expansion of various typologies of ethnography, without clear distinctions, has resulted in a field that is contested (Hammersley, 2018). Specifically in implementation, the compliance with key practices of ethnography including reflexivity, outlining the researcher's position, and descriptions of methods are lacking (Gertner et al., 2021). The value of ethnography to unearth implementation mechanisms is noted (Gertner, et al., 2021) and adopting realism directs the focus on generative causation and acts as an underlabourer to explain the phenomena under investigation (Alavi et al., 2018; Barron, 2013; Decoteau, 2017). Indeed there has been a surge in authors suggesting realism and ethnography are synergistic (Barron, 2013; Decoteau, 2017; North, 2017; Porter & Ryan, 1996).

The current thesis focuses on exploring how the implementation of behaviour change practices, in a well-defined set of practitioners, is achieved, which required moulding assumptions of classic ethnography. Focused ethnography originated to examine specific problems in sub-cultures where the researcher does not have to be from another cultural group (Knoblauch, 2005). Focused ethnography was developed to

explore processes within day-to-day practice and the application of focused ethnography in evaluating complex interventions and implementation is growing (Bikker et al., 2017; Higginbottom et al., 2013; Orton et al., 2019; Sobierajski et al., 2022). Importantly, culture is defined as unbounded, and actors do not have to operate in shared spaces or interact with each other. Alternatively, it is accepted that they share common experiences and a cultural insight (Cruz & Higginbottom, 2013). Unlike classic work, that attempts to suspend researchers biases, insider knowledge and familiarity with the literature are seen as useful to frame ideas for purposeful sampling, in a similar vein to realist sampling (Emmel, 2013; Higginbottom et al., 2013). The approach is collaborative and values what is remembered by the participants to answer a specific question. Several key adaptations from classic work exist in focused ethnography (Table 3.3). The emphasis on a focused topic and acceptance of a researcher who can also be a competent practitioner can increase the quality of the ethnography with short field visits (Woermann, 2018).

Table 3.2. Comparative features of conventional and focused ethnography (Knoblauch, 2005)

Conventional ethnography	Focused ethnography
Long-term field visits	Short-term field visits
Experientially intensive	Data/analysis intensity
Time extensity	Time intensity
Writing	Recording
Solitary data collection and analysis	Data session groups
Open	Focused
Social fields	Communicative activities
Participant role	Field observer role
Subjective understanding (researcher's perspective)	Conversation (participants perspectives)
Notes	Notes and transcripts
Coding	Coding and sequential analysis

3.7 The Realist Survey for Theory Testing

Testing programme theory usually relies on purposeful sampling to corroborate, refine, or refute initial CMOs (Emmel, 2013). This is usually through case study methodology, although a large portion of the realist literature does not have a clear allegiance to a specific methodology (Lam et al., 2021). Mixed methods research, of various guises, for theory testing in realist evaluation is encouraged as observing outcomes and validating theory is a quantitative endeavour (Hawkins, 2016; Pawson, 2013). Yet, case studies do not elucidate how the proposed mechanisms work for the wider population of interest, and capturing the outcome of interest across a wider sample, and proposing the programme theory to respondents for comment, increases the strength of the research claim (Ravn, 2019).

Mixed methods surveys can allow the examination of patterns of outcomes across wider settings, a comparison of contexts, and an exploration of why individual's chose a specific level of agreement/disagreement with programme theory, alongside increasing the potential for exposing alternative mechanisms across contexts (Mukumbang, 2021; Schoonenboom, 2017). Realist surveys help to discern the patterns of behaviour change implementation and the associations with programme theory, in addition to uncovering alternative explanations of implementation outcomes (Schoonenboom, 2017).

The realist survey utilised in this thesis, adopts a similar premise to the realist interview, where individual motives are tested not assumed, and the aim is to refine the correlational model between outcomes of interest (Schoonenboom, 2017). The realist interview adopts a teacher-learner approach whereby the researcher teaches the interviewee about the proposed causal theory and then the interviewee, from an informed position, can teach the researcher about their experience of the theory in action (Manzano, 2016). Although the realist interview values the conversational and co-productive nature of qualitative interviews (Manzano, 2016; Pawson, 1996), the goal of the survey is to increase the scope of data and provide a good summary of group level mechanisms. Pre-testing of qualitative questions for the survey can limit the issues with misinterpretation (Braun et al., 2020; Buschle et al., 2022) decreasing potential issues with item interpretation, meaning explanations may not be associated with the mechanisms of interest (Schoonenboom, 2017).

Comparison between practitioners is important in realist evaluation to gain insight about how mechanisms operate in contrasting circumstances, in this case various ERS settings. Regardless of the method used, mechanisms will also be conceptualised as proxies to reality, due to the realist assumptions about epistemology (Ravn, 2019; Williams, 2018). Simple descriptive statistics, it is argued, can identify associations between proposed mechanisms and outcomes of interest (Ravn, 2019). This can provide an average level of agreement for the existence of a mechanism, demonstrating a demi regularity and manifestation in the empirical realm and will help access diverse ERS which are usually isolated and hard to access (Buckley et al., 2018). These strengths of the claim (although still fallible) about mechanisms are greater if surveys show consistent associations across practitioners in diverse samples.

3.8 Vignettes as 'Proxies' for Capturing Outcomes

Outcomes are events which are observable and empirical research, with concrete observation, is needed to capture the manifestation of demi regularities and help derive the best explanation from theory proposals (Eastwood et al., 2014; Mukumbang, 2021; Sayer, 2000). The combination of intensive and extensive methods in testing realist theory is '*indispensable*' (Danermark et al., 2002, p.175). Although approximation of outcomes lacks explanatory power, it enables a precise expression of outcomes and association with programme theory, which is necessary to empirically test ideas about how causal powers exert their influence (Mukumbang, 2021). Direct observation is typically seen as the gold standard to measure the quality of care, however, recent evidence has highlighted that there is no superior method (Aujla et al., 2020). Moreover, direct observation is expensive, time consuming, burdensome, requires specific ethical considerations, and is difficult to implement (Evans et al., 2015; Peabody et al., 2004). Alternatively, vignettes, short descriptive scenarios which are written to reflect real life situations in a focused manner to stimulate discussions, are a useful proxy (Jefferies & Maeder, 2006). Vignettes have been shown to correspond well with actual clinical behaviour, contingent on robust development and pretesting (Hrisos et al., 2009; Peabody et al., 2004). Vignettes were used in this thesis to score the implementation of behaviour change practices of ERS practitioner during theory testing.

The current thesis conceptualised behaviour change implementation as including person centred interpersonal skills, BCTs, and the application of behavioural theory (see Chapter 1). Vignettes are a strong predictor of actual practices and the presence or absence of skills needed to foster behaviour change, showing their utility for theory testing in this thesis (Peabody et al., 2004). The development of the vignettes in this thesis also allowed the manipulation of attendee characteristics providing an equal opportunity for practitioners to show their competency levels by controlling specific variables within the vignettes (Veloski et al., 2005). Vignettes were developed to capture decision making, as well as behaviour change practice, to uncover if practitioners can recognise different psychological mediators of behaviour change, which is a challenging area to capture using other methods.

3.9 Rationale for Reflexivity

The realist research objective to peruse, and explain, how contested concepts like behaviour change practices are implemented, requires engagement with reflexivity and a transparent outline of my biography and the research context (Pawson et al., 2005). The realist evaluator cannot examine '*every micro-step in the implementation chain*' (Astbury, 2018, p. 74), thus some areas were given primacy during the research process. The selective decisions were made by me and as such require a critical examination to ensure I did not impose my '*own pet programme theories*' (Astbury, 2018, p.73). Furthermore, the research is underpinned by an interpretivist epistemology where knowledge is seen as value laden, subjective, and socially constructed (Frederiksen & Kringelum, 2021). This means it is necessary to consider my personal framework, presuppositions, and influences that surround the research (Maxwell, 2012). Although it is debatable if researcher's can be fully reflexive; reflexivity before, during, and after data collection (Roberts & Sanders, 2005) provides a platform to consider alternative explanations, track decision making, and live the principles of realism (Emmel, 2013). The following section outlines my own position and the presuppositions that were taken into, and emerged from, the research. The aim is to articulate how the research originated and the conditions that supported the initiation, and completion, of the work. Moreover, my personal framework, values, beliefs, and biography will be presented to increase the transparency of the work and make threats to credibility explicit. In addition to my own position, I present critical

reflections on how I managed my impositions to decrease threats to the dependability and confirmability of the thesis (Forero et al., 2018).

3.9.1 Background and Engrained Beliefs

I am a white, Irish, immigrant living in England originating from a working class father and middle class mother. My parents provided a stable, firm, and encouraging homelife and subsequently I had a privileged and sheltered upbringing. I was involved in rugby from a young age which shaped the social circle I navigated and values that become engrained in me. I was steadfast on taking sport seriously which also shaped my beliefs and my behaviours as I aged. This meant as I entered early adulthood, I was ignorant to the influence of socioeconomics, varying backgrounds, austerity, self-preservation, and how people's ability and attitudes towards PA might influence the implementation of behaviour change practices. Although going to university broadened my horizons and transformed my thinking, I started my PhD viewing the world through a reductionist lens; assuming implementation was subject to adequate skills and knowledge alone, as I had limited prior experience of the challenges of applied practice in constrained settings and working with diverse groups.

I undertook this self-selected PhD as I had an interest in fidelity since my undergraduate studies. Since school I have been interested in human behaviour, and I was overtly aware that while my peers engaged in usual teenager experiences, I was more interested in reflecting on why people undertook certain actions, why my peers felt the need to experiment and show off, and why I was not compelled to conform to usual antics. Due to the restricted Irish school curriculum, I did not have a language to explain this interest until I started university. I undertook a BSc in Nutrition with Sport Science and graduated wondering why there was no consideration of adherence to dietary behaviour, exploration on how practitioners may support or hinder adherence, or why interventions rarely discussed fidelity and dropout, increasing my early interest in behavioural science. My MSc in Preventive Cardiology exposed me to formal ideas about behaviour change, the complexity of healthcare, and intervention fidelity, cementing this interest. Nevertheless, my MSc was within a medical school and reinforced reductionist thinking, the medical model, and gave superiority to academic evidence, ignoring the complexity of applied practice.

Therefore my assumptions about the fidelity of behaviour change practices, although expanding, were naïve and I still had a 'knowledge deficit' view on why implementation may be subpar. My experiences and academic journey indoctrinated a view that once practitioners understand behaviour change practice, they will employ them with attendees, as I had no alternative information from what I saw as a credible source to inform me otherwise. My experience of working in a gym, having relationships with training providers and exercise professionals, and working as a cardiac exercise specialist exposed me to partial implementation, but I had a pretentious view that my colleagues were just not competent. In 2013 this started to shift as my formal understanding of behaviour change practices was growing and I started to question the formula needed for implementation. I become more reflective and noticed my own inconsistent application of evidence based practices, which made me curious about the causal factors that drive practitioner judgment and behaviour. I actively sought other experiences to observe 'theory in action' shadowing, and speaking, with weight management, smoking cessation, and rapid chest pain practitioners. Again, I saw the poor translation of behaviour change practices. Although my views were moulding to be more complex congruent, without other frames of reference, and a narrow view of what credible evidence included, I was blinkered to the diversity of factors that exert influence over implementation and that behaviour change practice itself is not a uniform practice that requires adaptation from textbook ideas.

3.9.2 Arriving at the Research Question

My own values and indoctrinated view meant that when I started the research, I believed PA was underutilised across healthcare, that many professions are ill equipped to support PA from simple advice to advanced clinical physiology, and I pondered why evidence does not get mobilised routinely. Arguably this interest stemmed from a utilitarian view of PA due my reading of the epidemiology, my understanding of exercise physiology, and revering PA myself.

When the PhD commenced, I was a lecturer in health, exercise, and physical activity. I aspired to transform my student's ideas about PA, collaborative practice, self-management, and behaviour change. I held PA in high regard and knew that the cornucopia of physiology is worthless unless people can be empowered to engage in more PA. My own degree did not allude to this once, which I often thought as strange,

whereas my MSc introduced me to behavioural science which validated my thinking around the importance of social sciences and psychology.

My director of studies was a catalyst for learning about naturalistic methods. As mentioned, I have an innate tendency to observe, reflect, and consider possible explanation of social beliefs and behaviours. Early supervisor meetings expanded my portfolio of what scientific enquiry could entail and quelled my anxieties about what *good science entails*, that resulted from my positivist background. Pragmatically I had also returned to applied practice as the university had secured a portion of the local commissioned ERS contract. During conversations about my research interest, I was already starting to use thick description and theorise to undertake a '*landscape analysis*' (Tumilowicz et al., 2015, p.62) from my own initial experiences of practice. Early supervisory meetings opened a new world of reading and how to make sense of the implementation culture of ERS in a credible way, with tools that I valued personally outside of academia. At the same time in my journey I was having conversations with Dr Katie Morton about how to shape the PhD. She also listened to my early reflections about the service, including the tensions, day to day activities, implementation climate and my research interests. She pointed me to realist evaluation which could provide me with a conceptual framing to arrange my early observations of the culture, as I naturally spoke in CMO configurations.

I decided to employ a focused ethnography as the starting point for the research after reading about realist evaluation, classic ethnography, and the diverse typologies of ethnographic approaches. The focused research question, positioning of the researcher (does not have to be an outsider), and acceptance of shared cultural insights felt, to me, to be more aligned with both realist evaluation and my specific interest in the implementation of behaviour change practices. Focused ethnography provided me with the tools to consider the historical, cultural, and organisational factors which may impinge or support implementation (Morgan-Trimmer & Wood, 2016). Journaling became a staple of the work and a platform to make apparent, and question, my engrained ideas about the ERS system and the implementation of behaviour change practices (McGannon et al., 2021). Reflexivity allowed me to enhance transparency and return to actors to seek rival ideas, or test my assumptions through '*small talk*' (Cribb et al., 2022).

The value of reflexivity lay in considering the priorities of the research as being in the culture, working with people, and living the mechanisms in a reflective state, which expanded my field of vision beyond my presuppositions about inadequate knowledge. The co-production of ideas provided unfamiliar aspects that I could not reach on my own (Griffiths et al., 2022). Initially reflecting on my own practice provided novel, but insular, ideas about patient characteristics, poor training (I attended a ERS accredited training), and external pressures. Yet, these were only partially confirmed by others in the culture who had other priorities (e.g. the role of the GP in supporting behaviour change practice).

3.9.3 Ensuring Reflexivity Continued Through the Research

Realist theory building involves prioritising areas of the system, generating hunches, redescribing data at a middle range using prior theory, retrodiction (thought experiments) and utilising common sense (Gilmore et al., 2019; Jagosh, 2020; Pawson, 2000). By initially living the complexities of implementation, to build programme theory, I gained a deeper understanding of what I was trying to analyse that went beyond one-dimensional ideas from the literature, documents, or individual perspectives (North, 2017). Immersing myself in the culture I gained both the experience of trying to implement behaviour change practices and was able to continually search for what worked/or not, where, and how. This unique reflective state and experiencing the mechanisms within context, or indeed being a mechanism, enhanced the linked nature of theory building, creating direction and empirical justification to adjudicate between rival theories (Barron, 2013). Importantly I had the flexibility to not only privilege the empirical account of an actor's subjectivity, but I could also theorise about the contingent mix of human action from mechanisms within both structure and agency. This initial phase helped to sensitise me to alternative accounts when theory testing. I felt more capable to represent the diverse factors that practitioners might experience when developing the survey or when interviewing people and, when analysing the data, I felt I had a greater mental portfolio of potential comparative theories, as I could draw on my experiences which had been processed more explicitly through the use of journaling and reflexivity.

3.10 Chapter Summary

Chapter 3 outlined the philosophical orientation of the research and the components of the research design. The meta-theoretical position of the thesis was articulated namely, realism assumptions about depth ontology, generative causation, and fallible retroductive middle range theorising. The rationale on how a realist evaluation can answer how, why, and in which circumstances ERS practitioner's implement behaviour changes practices was outlined. The research design, to operationalise the realist evaluation, was described along with the alignment of the chosen approaches to realist evaluation. Lastly, to enhance the transparency of the work, the researcher's position and a reflexivity account was outlined.

The following chapter outlines the initial stage of the realist evaluation which involved the formulation of programme theory related to the phenomenon under investigation. Chapter 4 details the eight-month focused ethnography that was undertaken to gain immersion with those trying to implement behaviour change practices to develop context specific configurations of how resources and conditions support implementation.

Chapter 4: Behaviour change practices in exercise referral schemes: Developing realist programme theory of implementation

4.1 Chapter Overview

This chapter outlines the development of programme theory proposing what works, from whom, in what circumstances to explain how the implementation of behaviour change practices in ERSs can be achieved. Initially, an outline of the chapter's position within the realist evaluation is provided. The study context and setting are then described. Subsequently, the methods employed for the initial phase of the research are presented. Lastly, the hypothesised theories, resulting from this phase of the research, are illustrated.

4.2 Chapter Introduction

The primary tasks in realist evaluation are to build a conceptual framework of the phenomena under investigation and elicit programme theory (Rycroft-Malone et al., 2010). The unit of analysis in realist evaluation is programme theory, conceptualised in this research as the ideas on *how* service inputs produce the implementation of behaviour change practices in ERSs (Rogers, 2008).

Method pluralism is encouraged to undertake programme theory development, but researchers' decisions should be described and justified (Wong et al., 2017), to avoid the selection of methods '*unthinkingly*' (Greenhalgh & Emmel, 2018, p.270). There is a need to demonstrate how the design is appropriate to build and test theory to answer the research question. Various approaches are used to undertake programme theory development ranging from, theory mining of the literature to utilising stakeholder accounts alone (Griffiths et al., 2022; Shearn et al., 2017). Yet, comparatively little is written about this phase of realist evaluation, and realist endeavours often underreport key decisions around theory development and testing (Booth et al., 2020).

Several aspects require consideration when undertaking programme theory development. It is recommended to '*start by learning as much as you can about the beliefs of those close to the programme*' (Astbury, 2018, p. 73) to develop a portfolio of candidate theories and map the contours of the phenomena under investigation.

Conversely, the limitation of using stakeholders account is also highlighted, as actors accounts may be partial or incorrect (Decoteau, 2017), and existing theories provide an inventory of explanations which can be connected with emerging ideas, or proposed to those within ERSs for confirmation or modification. Dual theorising is encouraged, which involves integrating substantive theory with granular theory, to connect accounts with substantive theory (Astbury, 2018). Employing established theory provides a menu of concepts to orientate the work, refine established theory in specific contexts, and allow middle range theorising and transferable learning (Westhorp, 2012). The justification of the a priori models adopted for this thesis has already been provided in Chapter 3.

The justification of adopting focused ethnography will be described forthwith. As briefly discussed in Chapter 3, ethnography is the study of culture and is increasingly being applied in implementation science, and has been proposed to be synergistic with realism (Barron, 2013; Decoteau, 2017; Gertner et al., 2021; North, 2017; Porter & Ryan, 1996). The application of ethnography in realist evaluation however is underexplored, and the rationale for the combination remains partial. It is argued in this thesis that combining ethnography and realism can attenuate the current challenges of operationalising realist evaluation namely, achieving integrity to realist principles, the lack of accessibility of the approach, the perceived esoteric nature of the approach, the difficulty in distinguishing between context and mechanism, the burden of the approach, and the perceived conflation of complex relationships (Jones, 2018; Porter, 2015; Rolfe, 2019).

Focused ethnography was utilised as it enhanced the ecological validity of programme theory development; allowed the researcher to experience and explain unintended outcomes in situ; explored disagreement between actors' intentions and behaviours; and provided a platform to prioritise elements of programme theory by experiencing mechanisms in action (Barron, 2013; Decoteau, 2017; North, 2017). This provided an antidote to top down and reductionist theory building by living the manifestation of mechanisms and interacting contexts. Focused ethnography advanced programme theory generation by cross checking emerging programme theory from desk based approaches with real life implementation attempts. Lastly, the naturalistic setting ensured theory development did not solely rely on actor recall, removed from the culture. It is believed that proximity to cultural activities and actions enhanced the

conceptualisation of context and mechanism and the identification of prudent CMOs. The research undertaken in this chapter was therefore to operationalise the initial task of a realist evaluation to explore the conceptualisation of behaviour change practices within ERSs and construct causal theories of implementation via concept mining, mapping across concepts, and building hypotheses from the conceptual framework (Rycroft-Malone et al., 2013).

4.3 Study Context

In 2015, the local public health team of a high socioeconomic region in the UK commissioned one provider to deliver their wellbeing strategy and accompanying lifestyle prevention services. The procurement included health walks, NHS health checks, weight management, diabetes management, and ERSs. The commissioning model departed from the existing in house delivery and requested a service provider to manage all the services outside of the council team. Subsequently, the successful applicant subcontracted various aspects of the contract to other providers with a central manager coordinating the delivery. The university, where I was employed, had been in talks with the main provider and were requested to satisfy a portion of the ERS contract. This generated a unique opportunity to access the field for research. Several facets of the culture were important to note. The service was in its infancy due to the new contract and commissioning model. There was a diverse locality team including a traditional scheme in a leisure setting, integration with a specialist scheme including cardiac practitioners, and academic staff operating on the university grounds. The academic contributions to the service delivery continued during this phase of the research and then decreased. New members of staff were employed to run the scheme on the university site until the contract ceased in September 2017.

There were three venues which varied in characteristics, generating a wide pool of context to explore. The service format was uniform across the venues and included a central administrative hub, that organised the referrals and managed the booking and provision of referral forms to practitioners. The service was a 12-week service with one free session a week and subsidised entry for other sessions (£2.50). The structure involved an initial assessment with pre-determined medical screening at baseline and a 12-week follow up assessment.

Ethnographic fieldwork involved working as an 'insider' practitioner at one site every Friday for eight months (160 hours). Additionally, during the first three months, fieldwork was also undertaken on Wednesdays by attending meetings with the service manager and coordinator, to discuss operations, service evaluation, service user entry, and data collection procedures (70 hours). Initially a large volume of time was spent as an isolated practitioner, but as the service progressed, and external staff populated the scheme, additional data collection was generated beyond individual experiences. Within the last month, visits to the two other schemes were undertaken every week to explore the culture and actors within them (15 hours).

4.4 Realist Sampling

The service was purposefully sampled as purposive work envisaged that the service format, staffing structure, and diversity of schemes would be examples of mechanisms in action. Exercise referral was defined using the traditional model which involved a non-integrated referral from a GP, a 12-week PA programme, partially subsidised entry for attendees, and run by a qualified ERS practitioner in a leisure setting. Purposive work provided direction to ensure the sampling of people, documents, observations, and the scheme, were relevant to building programme theory (Booth et al., 2020), in this case how, why, and in which circumstances behaviour change practices can be implemented by ERS practitioners. In addition, access to the ERS service was facilitated by the opportunity presented by the subcontracting relationship with the main provider. This external power, along with purposive ideas about suitability, were central in driving the initial sampling of the service. The process of purposive ideas, informing purposeful choices, corresponds with a realist view of sampling, as realist evaluation is an iterative process of proposing conjectures for testing and refinement. The process of proposing ideas for verification or refinement should encase all the research procedures including fallible ideas about why research actors/artifacts are chosen to help populate programme theory (Emmel, 2013).

Reading of organisational development and implementation literature, previous experience, attending ERS training, and conversations with those close to ERSs framed the appraisal of the service's appropriateness for initial theory building. The service was typical of ERS commissioning with a history of short contracts, fluctuating resource allocation, and cycles of in house and external provider service delivery. This

informed purposive ideas about the suboptimal organisational infrastructure, potentially causing issues with role clarity and integration with referral partners. The purposive work also identified the presence of academics within an ERS as different, generating a learning opportunity. It was envisaged that the different views on practice would unearth potential issues with typical delivery. Additionally, the service adopted a medical model, which is typical of ERSs and was expected to create implications for behaviour change implementation, where implementation would not be considered, and practitioners would align with a 'numbers through the door' approach. These initial ideas assembled tentative theories about how real ingredients may influence implementation outcomes, as such the scheme was seen as a useful representation of ERSs to investigate (Emmel, 2013).

4.5 Ethics

Ethical approval was granted by St Mary's University ethics panel. All ethical considerations were accepted in the ethics application, and data was managed in line with legislation and in a confidential manner. All data collection was overt, and verbal consent was obtained to observe participants, whilst written consent was gathered for formal interviews. When observations involved service users, the purpose of the research was explained, outlining that the practitioner was the topic of investigation not the attendee. Service user permission was informally gained to attend sessions to avoid interrupting usual practice. Several ethical considerations, specific to implementation science (Cribb et al., 2019; Gopichandran et al., 2016) and ethnography, (Lapadat, 2017; Winter & Lavis, 2020) were synergist, especially under a realist lens. Table 4.1 illustrates specific ethical considerations and how they were managed during this phase of the research.

Table 4.1. Specific ethical considerations in this research and the practices adopted to mitigate issues

Ethical consideration	Practice adopted to mitigate potential harm
Power dynamics	Teacher learner approach (Manzano, 2016) Valuing folk wisdom (Booth et al., 2013) Valuing a democratic community (Lapadat, 2017)
Unpredictable exposure to the culture (e.g. practices, responses to practices, employment conditions)	Reflexivity (Rashid et al., 2019) Formative feedback (Ronkainen & Wiltshire, 2019) Developing a shared purpose (Gopichandran et al., 2016)
Potential exposure to marginalised groups	Listening (Winter & Lavis, 2020) Process of accountability for ancillary care (Gopichandran et al., 2016)
Perceived need/utility of implementation research by those within the culture	Listening (Winter & Lavis, 2020) Developing a shared purpose (Rashid et al., 2019) Benefit sharing (Gopichandran et al., 2016)

4.6 Data Collection Methods

Document analysis, participant observation, reflexive journaling, and interviewing were undertaken during the focused ethnography. The analysis of the documents, and early journaling and memos, provided the candidate theories which were refined through further fieldwork and the formal interviews.

4.6.1 Document Analysis

Documents were sampled based on their relevance and utility to populate programme theory (Pawson et al., 2005). Utility was defined as the scope of documents to contribute to the generation of a conceptual framework or to describe mechanisms. Relevance was applied by examining if documents were appropriate to advance the aim of the research. The purpose of the document analysis was to concept mine key resources, processes, and outcomes, related to behaviour change in ERSs. The document analysis also explored any explicit rationale for guidance related to implementation. Lastly, the document analysis provided learning about the evolution, history, operation, and contemporary thinking (Mukumbang et al., 2016) within ERSs. Thirteen documents were utilised during this phase of the research (Table 4.2).

Specific websites were searched including Google, Google scholar, Register for Exercise Professionals, Sport England, and local authority databases. Key phrases included 'exercise referral', 'physical activity prescription', 'exercise on referral', 'physical activity promotion'. The search was not systematic and prioritised grey literature and local documents including, the National Quality Assurance Framework, practitioner training manuals, national guidelines, and exercise professional toolkits (Table 4.2). The document analysis was an evolving process and occurred alongside fieldwork, which provided iterative learning and document sampling. The document analysis was fundamental to explore what behaviour change was envisaged to include, and how programmes were encouraged to develop services. The selection of local and national documents also provided insight about local deviations from policy and provided contextual factors pertinent to local implementation. Utilising grey literature and internet searches is considered more important than systematic searches for realist theory building (Booth et al., 2018). Once initial programme theory was developed, document analysis was replaced with consulting those within the culture and purposeful participation observation.

Table 4.2. Documents selected to build programme theory of implementation

Documents	Author
Exercise referral systems: a national quality assurance framework	Department of Health (2001)
Professional and operational standards for exercise referral	Joint Consultation Forum (2011)
A toolkit for the design implementation & evaluation of exercise referral schemes: guidance for exercise professionals	British Heart Foundation Centre for Physical Activity and Health (2010)
Physical activity: exercise referral schemes	National Institute for Health and Care Excellence (2014)
Behaviour change general approaches	National Institute for Health and Care Excellence (2007)
A toolkit for the design, implementation & evaluation of exercise referral schemes	British Heart Foundation Centre for Physical Activity and Health (2010)
Exercise for life physical activity in health and disease	Royal College of Physicians (2012)
Exercise referral exercise instructor qualification training manual	Training provider 1 (2015)
Service specification lifestyle prevention service	Council 1 (2015)
Service specification exercise referral	Council 1 (2015)
Sporting future a new strategy for an active nation	Sport England (2016)
Global action plan on physical activity 2018-2030	World Health Organization (2018)
Blueprint for an active Britain	Ukactive (2014)

4.6.2 Fieldwork

Throughout the eight months in the field various modes of observation were used- complete participant, participant as an observer, observer as a participant (Table 4.3). Initially a large volume of time was spent as an isolated practitioner, which required the use of extensive journaling and reflexive practices (see below). As the service progressed, and external staff populated the scheme, informal interviews, visits to other schemes, and participant observations were undertaken. Importantly, and in line with realism and focused ethnography, fieldwork provided an opportunity to co-theorise with actors, check the researcher's interpretation of culture, experience implementation in action, and explore the reasons behind actor's actions.

Table 4.3. Various approaches to participant observation adopted (Gold, 1958)

Observation approach	Description
Complete participant	Full member of the culture without impeding normal activity.
Participant as an observer	Taking part in the culture but focused more on observing. Accepted member of the group but the actors know that the main aim is to undertake research.
Observer as a participant	Takes a peripheral role in the culture and only participates to allow for data collection.

Due to the restrictions of the culture the personal reflections from the field came first. Journaling was a central data collection tool noting '*what stood out*' to advance thinking about prudent concepts and interrelationships (Newbury, 2013). The isolated fieldwork allowed for immersion into the culture and repeated exposure to various activities. Additionally, as the service was novel, within the typical local delivery of ERSs, it allowed the opportunity to see the '*familiar as strange*' (Mannay, 2010, p.94). Although open to actor refinements providing additional insight, the isolated fieldwork indicated where I should hang out, who I should observe, and what I should discuss (Emmel, 2013). The approach to observation was focused rather than recording all the physical and environmental aspects, and utilised actors to reflect on their actions, past experiences, and the wider social structures at play (Higginbottom et al., 2013).

4.6.3 Realist Interviews

Semi-structured realist interviews (68.5 ± 12 mins) were undertaken with all eight frontline practitioners, as realist evaluation privileges the abundant and legitimate knowledge practitioners possess (Pawson, 2013). All staff were invited to participate in the interviews either in person or by email, and all agreed to take part. Access to the other ERSs sites was facilitated by the service manager. Interviews were undertaken in a quiet room at a time and place convenient to the participants and written, informed consent, was obtained. All interviews were audio recorded and transcribed verbatim.

The interview approach was a teacher-learner style whereby the researcher teaches the interviewee about the proposed causal theory and then the interviewee, from an informed position, can teach the researcher about their experience of the theory in action (Pawson, 1996). Theories from the document analysis, and reflections from the field, were consolidated into testable statements and an interview schedule (Appendix A). As this phase of the research was both theory gleaning and theory testing, the initial section of the interview explored the practitioner's interpretation of their role, behaviour change practices, and what they thought would impact the implementation of these practices, why, and for whom, which produced inductive data. This required flexibility to potentially pursue inductive statements or direct interviewees to test generated theory from the fieldwork.

Questions were posed to obtain the actor's perspective on hypothesised mechanisms and the essential linked aspects of context (Manzano, 2016). Interviewees were presented with ideas about implementation to comment on, refute, refine, or confirm. Lastly, interviewees were encouraged to prioritise the important theories of implementation and '*fine tune*' the components of the idea (Manzano, 2016).

Several aspects were adopted to stimulate interviewee reflection and avoid inappropriate confirmation of theory mechanisms. Practitioners were fluent in articulating the context and resources that may impact their implementation behaviour but hesitant when discussing mechanisms. Probing that utilised '*why*' supported a reflection on cognitive mechanisms. Additionally, a large emphasis was placed on theorising about other circumstances to expand theory development (Manzano, 2016). Lastly, a proposal of rival mechanisms was placed in front of practitioners to adjudicate between (Byng et al., 2005). The interview schedule, and the language used, were iteratively modified, as the interviews progressed, to be more accessible and conversational as opposed to conversing in CMOs.

4.6.4 Journaling and Memos

Memo writing in this project was characterised by notes to myself to trace the evolution of ideas and concepts related to the implementation of behaviour change practices. Memos were typically used as marginal notes during the analysis of documents, journal entries, and interviews. These notes provided thought experiments that were expanded into structured journal entries and supported retrodution (Jagosh, 2020). Memos were also kept in the form of mind maps about the research process and evolving causal configurations of concepts. Pictures of the mind maps were taken and consulted during broader journal entries which provided a space to elaborate what was being discussed within, and across, data sources (Layder, 2005).

Journaling was used to stimulate a reflective state and provide a platform to record and examine the interplay of observations, thoughts, questions, theoretical ideas, anxieties, and potential impositions on the data (Newbury, 2013). The journal took various forms, however, the traditional segregation of the diary into substantive, methodological, and analytic categories was not appropriate due to the context of ERSs (isolated staff, limited group environments, absent management). Reflections of practice, and the document analysis, encompassed the main body of the journal. This

format of a diary aligns with the idea that practice is a form of research, and journaling provides a reflexive practitioner to generate new knowledge about real-world environments (Herriott, 2019). The diary was constructed by retrospective journaling from recent practice, immediate journaling post practice, extending memos and engaging in a commentary on how practice resonates or conflicts with various literature.

Due to the focused ethnography and realist underpinnings, the journal was shaped by the desire to unearth key concepts pertinent to behaviour change implementation and develop conjectured ideas about underlying mechanisms from experiences. The journal involved retrospectively thinking about experiences, self-evaluating the actions, and feelings, from the experiences and using theoretical perspectives to reorientate the reflections influencing emerging ideas around implementation (Quinn, 2000). Additionally, the quest to identify CMO configurations guided the reflections and aligns with various established models (Table 4.4).

Table 4.4. Reflective approaches highlighted by Johns (2006) and Jay and Johnson (2002) that framed the reflective practice

Dimension	Example reflective questions
Descriptive	What is happening? Is this working? And for whom? And why? How am I feeling?
Comparative	How do others involved describe what is happening? How can this be improved? What does research contribute to this matter?
Influencing factors	What factors internally and externally influenced my decision making? What knowledge influenced my decision making?
Learning	What are the implications of the matter when viewed from these alternative perspectives? What is most prudent for this matter? What does this reveal about implementation?

4.7 Data Analysis

4.7.1 Overarching Analysis Procedure

All sources of data underwent the same content thematic realist analysis procedures detailed below. The initial document analysis was an exception to this, as in addition to content thematic analysis, logic model labels were first applied. Logic models usually adopt five categories (inputs, processes, outputs, outcomes, and impact) to organise phenomenon and provide a simplified causal path between the categories (Greenhalgh & Emmel, 2018; Rogers, 2008). Logic model labels initially facilitated mapping concepts of ERSs across their resources, outcomes, and potential change theories (Ebenso et al., 2019).

All data sources were uploaded to NVivo 10 to facilitate categorising data and unpicking patterns of programme theory. The analysis technique applied was content-thematic analysis outlined by Bowen (2009). An initial reading of each data source was undertaken to become familiar with the content. Additional reading of the text provided the opportunity to make memos and categorise segments. Content analysis was used to separate meaningful passages of text, pertinent to the research question, into conceptual '*bins*' (Maxwell, 2012, p.111). Content analysis allowed a first pass review to categorise information which could then be explored further. The CMO heuristic was then used, within a reflexive thematic analysis format, to creatively retrieve interpretive stories about the causal patterns within each segment that was coded (Braun & Clarke, 2019; Wiltshire & Ronkainen, 2021). Individual extracts that articulated C, M, and O or dyads of C, and M were coded using the CMO heuristic (Jackson & Kola, 2012). The CFIR then provided a coding manual to abstract data to established constructs across the levels of the implementation system (Damschroder et al., 2009). The COM-B, and associated TDF, were combined with the CFIR, providing an explanatory apparatus to theorise causal links across the levels of the system (Atkins et al., 2017; Michie et al., 2011).

4.7.2 Step 1: Theme Identification

Deductive coding was initially utilised to code any formal resources, suggested planning or implicit/explicit mechanisms envisaged to support implementation from policy documents. Logic model labels were used to arrange service activities, inputs, and outcomes relating to ERS best practice. The theory of change label was used to

highlight how service activities were envisaged to lead to implementation. This provided a useful separation of envisaged outcomes from service activities and wider recommendations about service orientation/planning.

The elements within each logic model label were, however, diverse, so inductive coding was undertaken to organise overlapping topics into theory areas. The approach, outlined above (4.7.1), was undertaken which utilised the CMO heuristic and a priori frameworks but analysis was open to extending the frameworks, if data did not align with the definitions provided from the conceptual scaffolding. Multiple CMO's were present in each theory area, therefore, '*if then*' statements provided a formula to reduce theory areas into a smaller number of causal statements. This was done by examining the CMO's and adopting labels that could accommodate/consolidate the diversity of CMOs.

4.7.3 Step 2: Iterative Theory Generation

As each new data source was uploaded to NVivo 10, it underwent the same overarching data analysis procedure, in subsequent rounds of analysis however, the initial theme identification labels provided deductive codes to categorise relevant segments as new data sources were uploaded (analysis was also open to new themes).

As data analysis continued copious CMO's were generated, which provided an inordinate level of theoretical ideas. Therefore, each CMO underwent another process outlined by Pearson et al. (2015). The process involved cross checking emerging ideas to examine if it could be encapsulated by existing programme theory or required the generation of a new causal idea (Figure 4.1). This simultaneous examination of novel constituents of data allowed for a robust reduction and packaging of data.

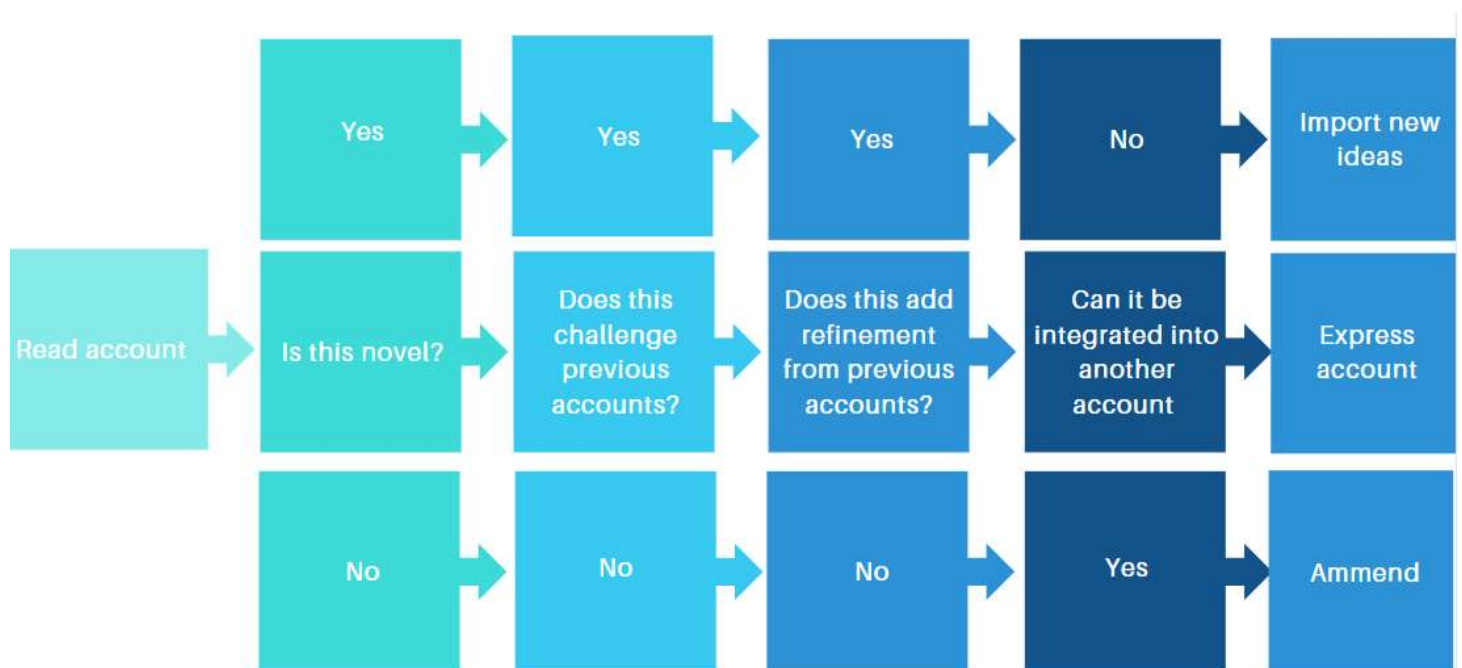


Figure 4.1. The process undertaken to consolidate diverse data into manageable programme theory (Pearson et al., 2015)

4.8 Realist Tenets of Validity

Research validity was conceptualised from a realist viewpoint, (Ronkainen & Wiltshire, 2019) where the principles of ontological plausibility, empirical adequacy, and practical utility informed practices to enhance validity. The realist evaluation guidance to enhance validity typically focuses solely on the relevance and rigour of data (Westhorp et al., 2013). The viewpoint taken here builds on this and develops an increased alignment to the paradigm assumptions. Validity, under a realist guise, embraces relativism and multiple realities, but assumes that some accounts may be closer to describing real entities than others (Ronkainen & Wiltshire, 2019). The judgment is then not on the procedures used to produce and validate' accounts but in the relationship to the phenomenon it is an account of. In other words, validity should be appraised not by the '*method itself*' but how accounts explain the entities under investigation (Maxwell, 2012, p.119). The inability to obtain certainty requires a proxy measure of validity which is ontological plausibility. The quality of accounts can be examined for their plausibility to describe the '*actual state of affairs*' (Harré, 2012, p. 23). Theorising the unobservable alongside sufficient, diverse, tangible, and accurate

data, defined here as empirical adequacy, is needed to strengthen plausible claims (Sayer, 2000). Lastly, validity is considered not just in explaining the world but having practical utility. To summarise, validity in realist research can be achieved when observations are accurate and represent the events of the real world, there is ecological validity with reference to participants interpretations, and there is coherence in explaining plausible theories of outcomes (Ronkainen & Wiltshire, 2019).

The following approaches were adopted to enhance validity through a realist lens. The use of multiple data strands, critical friends, co-created theory building, and extensive journaling was adopted to enhance the descriptive validity and transparency of the work (Maxwell, 2012). The adoption of the CMO heuristic, fieldwork, and use of established theoretical frameworks attempted to enhance the plausibility of causal ideas (Ronkainen & Wiltshire, 2019). Lastly the use of focused ethnography and ongoing theory adjudication, from the onset, makes the work more acceptable and useful for practical recommendations (Decoteau, 2017). Datasets were coded by the lead author and circulated to the research team.

4.9 Results

The aim of the ethnography was to establish what behaviour change practices are conceptualised as in ERSs, map pertinent concepts, and formalise the programme theories of implementation. Initially, in this section, the conceptualisation of behaviour change practice, from the document analysis, is outlined. Three theory areas are then identified namely 'behaviour change operating procedures', 'integration with medical professionals' and 'supportive leadership'. These theory areas are proposed to modify practitioner capability and motivation to implement behaviour change practices (Figure 4.2). Motivation and capability are broad mechanisms which encompass 12 domains of theoretical constructs (Atkins et al., 2017). The mechanisms are represented using motivation and capability labels to enhance the transferability of the findings to other implementation scenarios and encompass multiple interpretations from practitioners. These mechanism labels are broken down across the 12 domains in the results presented below, under the theory area sub-headings. The document analysis and initial reflections produced over 70 potential activities related to supporting implementation across four theory areas and 30 potential mechanisms of action. Iterative theory building through field notes, observations, and interviewing led to the

consolidation of two theory areas, removal of one, and inclusion of another. The formal interviews are the only supporting data presented below as they verified and elaborated the theories from other data sources, including the documents and reflexive journal. What is presented below is the cumulation of enduring elements that emerged across all data collection procedures.

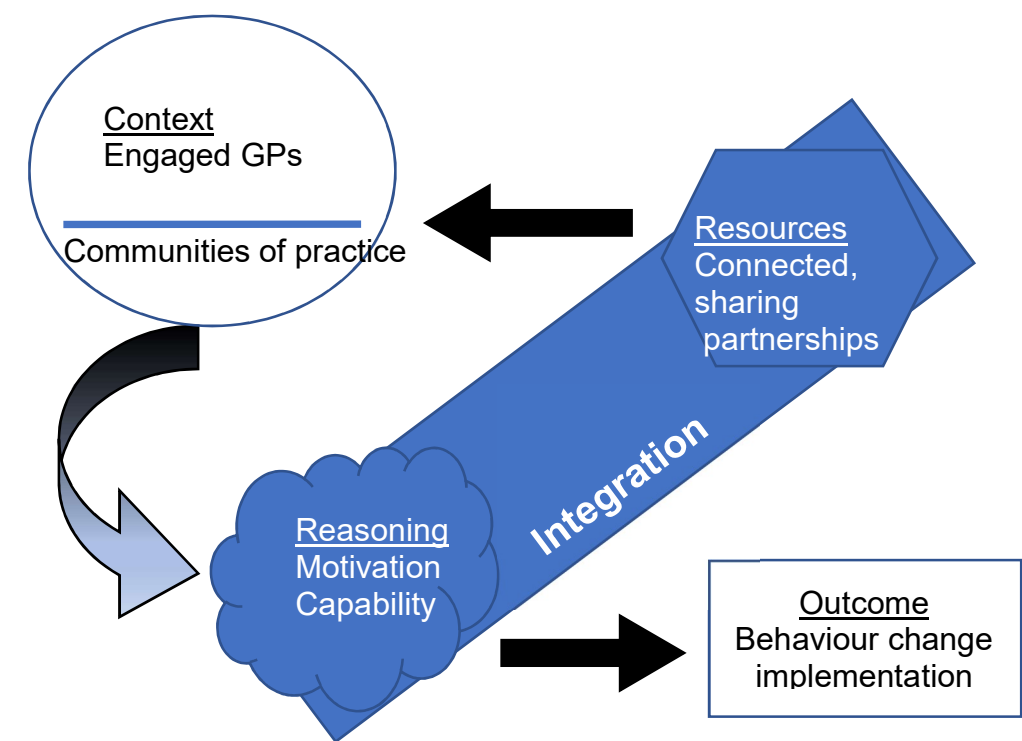
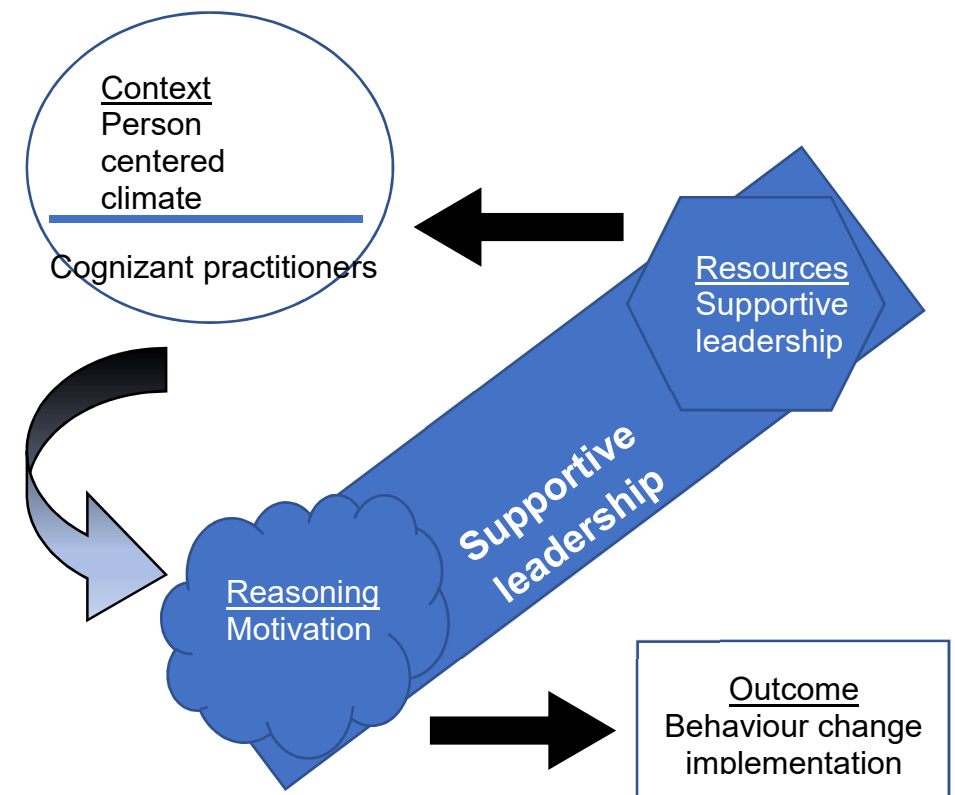
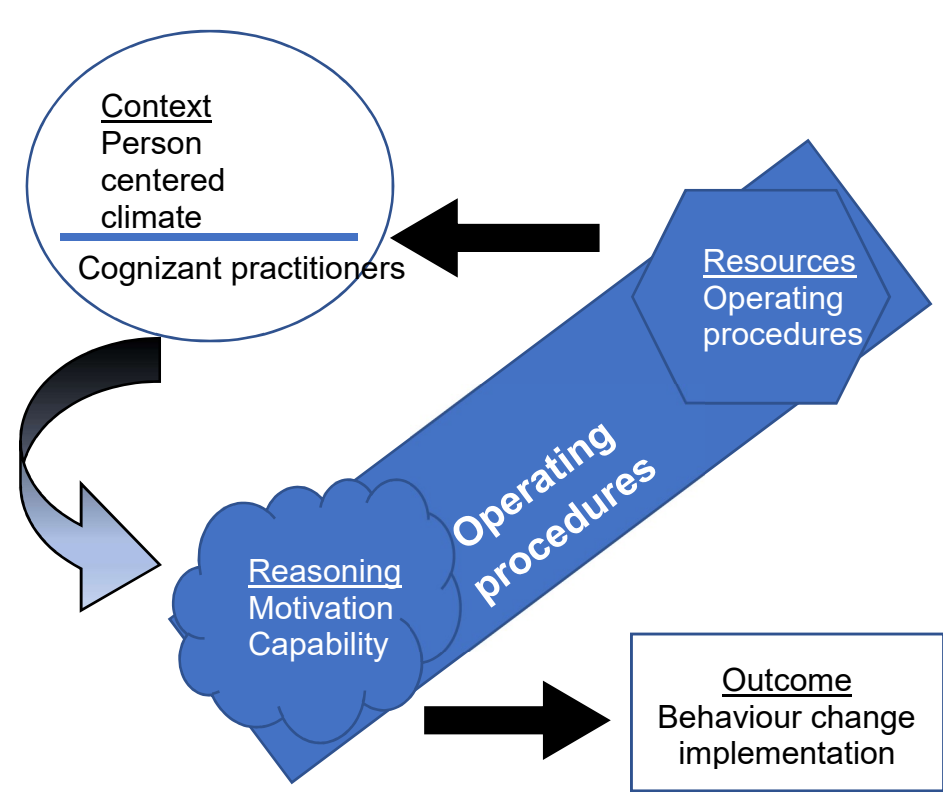


Figure 4.2. Visual representation of the programme theories using Dalkin and colleagues CMO templates (Dalkin et al., 2015)

4.9.1 Policy Level Definitions of Behaviour Change Outcomes

The documents were fragmented, vague, and inconsistent when describing behaviour change practices. Nevertheless, they provided a starting place to develop what behaviour change was envisaged to be, and the potential limitations inherent in the field, which could impact various interpretations of practice and the subsequent implementation of these practices.

A 'Patient' Centred Model

The overarching conceptualisation of the service is patient centred. Although the definition was not clearly articulated in the documents, it is encouraged that a philosophy which aspires to help people towards an independent lifestyle, through a personalised experience, underpins practice. Tailoring, collaboration, and continuity of care are core facets of PCC retrieved from the document analysis. Tailoring is encouraged across both organisational and practitioner levels. It is stressed that attendee, and local needs, guide the development of the inclusion criteria. At the local level, it is recommended that practitioners undertake a '*systematic individualised process*' in relation to the patient programming (DOH, 2001, p. vii). Tailoring was said to be important based on the attendee's openness to change, capacity to change, preferences, health literacy, expectations, and wider socioeconomic circumstances. Behaviour change practices are also thought to include fostering attendee choice and being able to provide opportunities suitable to meet the individual's needs.

Behaviour Change Techniques (BCTs)

There were a range of BCTs highlighted from the document analysis, providing insight into what successful behaviour change implementation involves. Behaviour change practice is thought to include the use of goal setting, self-monitoring, education, reviews, and feedback. Evolving practice guidelines formalised the inclusion of BCTs and extended the above to include action planning, relapse prevention plans, and facilitating social support, depending on the individual needs (NICE, 2014) (Chapter 1). Furthermore '*motivational strategies*' and '*motivational communication skills*' were considered successful behaviour change implementation (DOH, 2001, p.25, 19) Examination of these vague terms in the culture were interpreted as MI skills and

practice, but they were open to interpretation as no formal definitions were noted in the document analysis.

Behaviour Change Theory

The explicit recommendations to utilise psychological theory was not consistent, although older guidance recommended that a *'model of behaviour change should be employed by all who have an interaction with potential participants'* (DOH, 2001, p.19). Conversely, a key result of the document analysis noted that successful implementation indicators were associated with theory led practice. Implicit language, which corresponded to the Transtheoretical model, (Glanz & Bishop, 2010) was evident as behaviour change practice should identify motivational processes, assess readiness to change and enhance the self-efficacy of the attendee. Practitioners should also receive training on behaviour change models, which indicates that staff are expected to utilise theory led approaches.

4.9.2 Theory Area 1: Behaviour Change Operating Procedures

Operating procedures was a broad term used to package provisions which show a commitment to organisational planning to support behaviour change practices. Training, mentoring, appraisals, feedback loops, and ongoing continuing professional development were referenced across data sources as essential operating procedures for implementation. The provisions were postulated to impact skills, knowledge, and the memory capabilities of practitioners. Alongside changes to capability, training was suggested by practitioners to influence motivation via identity and automatic motivation processes.

Additionally, practitioners highlighted that behaviour change protocols, including practice manuals, service plans, and resources for behaviour change interactions, were important for implementation. Practitioners highlighted that the lack of behaviour change protocols impacted upon their motivation to use behaviour change practices, due to a diminished role clarity. Moreover, the lack of behaviour change focused procedures altered their intentions to use behaviour change practices. The following quote highlights that despite a desire to implement behaviour change practices, a lack of organisational planning created difficulties when trying to implement them.

Em, yeah maybe like what is normal for us to do in practice, what is talked about because as I said before it is only really my norm to think about these things because we learned it at uni There are a lack of strategies to help tackle the situation where behaviour change is not working as well, there wasn't any strategy in place to say 'ok well we need to actually focus on this for every person and if this happens what is the way around it'. That would empower me to be there at my job and focus on behaviour change (Interviewee 1).

The absence of generic organisational planning, and practice expectations, had consequences which did allow those who were cognizant and driven to support behaviour change to act on their own motives. The quote below describes how the lack of organisational pressure allowed some practitioners to practice as they wished.

If you're looking at materials and that kind of thing and behaviour change, they don't really take that into account, they're just looking at targets. I did an introduction to counselling skills course as well and mental health first aid, as, I thought those would be useful skills. It wasn't anything to do with here it was just personal. I think just generally it improves your communication and listening skills ... so, it improves knowledge and then you can better understand what stages people are at and what you can do to help them get on to the next stage. (Interviewee 8).

The hypothesised motivation and capability mechanisms are therefore contingent on contextual factors. Practitioners suggested that motivation and capability would become more widespread in response to behaviour change planning and training if: i) a person-centred climate existed, ii) practitioners were cognizant of behaviour change practices and iii) practitioners had a desire to support individual independence. Many practitioners are personal trainers, yet ERSs were seen as incongruent with personal training which is highlighted in the following quote.

I think the way PTs (personal trainers) operate doesn't really facilitate for behaviour change to be used; they don't care, they don't want to listen to their client, like they are there to train them. I think it's very different, PTs I think tend to want the client to rely fully on them for their changing behaviour (Interviewee 2).

In brief, if there is a person-centred climate and cognizant practitioners (C) and the service provides behaviour change orientated planning and training, then practitioner's motivation and capability (M) will increase, leading to the implementation of behaviour change practices (O).

4.9.3 Theory Area 2: Integration with Medical Professionals

The initial theory building from the document analysis highlighted service integration between medical professionals and the exercise professionals as important. Documents consistently stated the need for all stakeholders to contribute to the programme development and understand their roles. This theory area, however, was not pursued as the envisaged rationale for behaviour change implementation was unclear. Instead journal entries emphasised the manager's role in facilitating these relationships with GPs which would improve the service, but not the implementation of behaviour change practices.

Despite this, it became clear when discussing implementation with practitioners, that the relationships with GPs were a vital element of behaviour change implementation. Practitioners articulated that the GPs commitment and value of the schemes was important. Furthermore, if GPs assigned to, and adopted behaviour change practices, it was envisaged to generate a champion outside the programme thereby supporting implementation. This theory is embedded within the below proposition as practitioners highlighted that a community of practice and communication channels were important for implementation.

Yeah, I mean it's about, erm, we'd get some people who came in and they weren't expecting what we offered. Yeah, I mean if GPs had more time to go through behaviour change with them and try to get them to the contemplation or even planning stage. Yeah, and then that would obviously move them on and we wouldn't be stuck trying to get them to contemplate it in the first place you're more confident dealing with them (Interviewee 8).

Practitioners explained that integration with GPs/ referrers through phone calls, email, documentation, meetings, role modelling, and vicarious learning influenced their motivation and capability. Integration was thought to influence motivation through changes in emotions, group identity, and intentions. Integration was also suggested to

increase the ability to self-regulate practice, in which conscious efforts were made to build/break habits. One practitioner described their contrasting roles and how integration impacted their motivation to implement behaviour change practices.

But it was working remotely so again it was like a very independent role, I was on my own in the leisure centres delivering, whereas in the NHS you had a set structure and you had people to consult with, like to bounce ideas off, it was so much more motivating like when you were in a team to like enhance your practice (Interviewee 2).

It is suggested that integration would influence the motivation of practitioners when GPs understand, value, and are interested in ERSs and behaviour change, and when there is a perceived shared effort across professions. The below quote illustrates what conditions are needed if integration is to work.

If the GPs in the area knew what the skills of the staff here had, that could make quite a big difference... I think, erm, yeah you get some inappropriate referrals and you kind of think if I just spoke to the GP I could find out what the correct thing is for the patient really... help being validated as a profession and then on the upside if I feel the GPs are buying into it, I feel a little bit more like 'ah, this is what we're supposed to be doing' (Interviewee 8).

The realist theory is as follows, if there is GP enthusiasm for ERS, and a perceived connected team effort for behaviour change (C), and there are established integrative communication channels, then practitioner motivation and capability will increase (M) leading to the implementation of behaviour change practices (O)

4.9.4 Theory Area 3: Supportive Leadership

The concept of leadership was the only theory area that was ambiguous and contested across the data sources. The idea of a manager leading ERSs was alien to most practitioners and they were unaware that this is a salient recommendation in practice guidelines.

So I think I'm seen more as a manager, and I take on more of the managerial roles however I'm not technically a manager (Interviewee 7).

Policy documents were clear however, that an identified lead, and their subsequent activities, are central to policy implementation. It was uncovered in the document analysis that local leaders propel programme development by arranging activities to ensure the programme is evaluated and made accountable. A manager is envisaged to ensure compliance via coordinating the individuals and agencies in the programme and identifying, and supporting, staff training. Lastly, the manger will coordinate shared agendas, integration, and the dissemination of key developments. The document analysis highlighted that this may support a motivation mechanism including identity, commitment, and role clarity. An interesting aspect of the policy documents was the lack of emphasis on the competencies needed for this role, or how these professionals fit within the service. When leadership was proposed to practitioners for comment in the interviews, most practitioners refuted the idea that the manager should lead the programme and coordinate integration with GPs, as this was seen as unobtainable.

But I think there should also be some sort of like governing body that would oversee the doctors and us and then makes sure that we are all working together...I think a manger would play a big role as they don't have anyone telling them otherwise or directing them telling them what they want. Well just de-motivates them to do anything in a certain way and they will come in and do whatever is fun from them (Interviewee 1).

The analysis did however highlight that supportive leadership through role modelling, clear behaviour change expectations, and the allocation of resources are important. The provision of supportive leadership activities is suggested to influence motivation through identity, intentions, and the emotions of practitioners, illustrated in the following quote.

Well, with here there was buy in throughout the chain whereas in other places there's not, not even from the upper management in other places. Ms S is great for this because she was really, she had the same motivation as me, but she had quite an in-depth knowledge on it (behaviour change) and she mentioned she was getting trained in behaviour change so, a mentor would be great for people with no experience.... to weirdly enough instil a behaviour change in you a self-fulfilling prophecy, you know (Interviewee 5).

Nonetheless, against a backdrop where local leadership is rare, this theory is contingent on a wider cultural commitment to behaviour change and organisational investment and stability which is not seen in ERSs. The impact of leadership activities, on motivation, were often contingent on a person-centred climate and behaviour change cognizant practitioners. Where the service focused on throughput as a measure of success, and practitioners were unaware of their role within behaviour change, practitioners outlined that self-preservation would impinge their ability to implement what a leader may be trying to mobilise throughout a service. In summary, if there is a person-centred climate and cognizant practitioners (C) and supportive leadership is present, then the motivation of practitioners will improve (M), leading to the implementation of behaviour change practices (O).

4.10 Discussion

Behaviour change orientated operating procedures, supportive leadership and integration between ERSs, and medical professionals are broad themes which are suggested to influence practitioner motivation and capability. Changes to the motivation and capability of practitioners is contingent on several conditions. There must be an organisational person-centred climate, practitioners must be cognizant of behaviour change, and/or there must be a community of practice, including medical professionals.

Implementation literature in ERSs is sparse, however, lessons from other behaviour change services can be drawn upon. Moreover, by abstracting data to established aspects of theory it allows the programme theories to be portable to other primary care services (Pawson, 2013). The current programme theories accumulate understanding on how behaviour change science may be implemented into healthcare and thus provides direction for testing in other settings. What is evident across other primary care services is that similar contextual factors impinge the translation of policy to practice (May et al., 2016).

In this research, operating procedures that prioritise behaviour change practice, through planning and training, are suggested to influence the motivation and capability of practitioners. Operating procedures are only thought to positively impact implementation if there is a person-centred climate or if there is freedom for motivated staff to act on their own values. The need to have explicit planning and procedures for

the service aim and provide ongoing training, as outlined in this study, is supported by other research examining the implementation of behavioural interventions (Damschroder et al., 2017). Additionally, when the climate adopts a focus on throughput alone, practitioner implementation, of person led care, is known to be impinged, confirming the data from this research (Elwyn et al., 2016). The current study advances the literature by proposing tentative causal explanations of how the organisational climate and operating procedures influence practitioner behaviour.

Leadership that engages with behaviour change practices was found to impact practitioner motivation in this research. Specifically, the presence of a leader who is committed, knowledgeable, and expectant of behaviour change, is proposed to positively impact motivation. The role of supportive leaders in evidence implementation is well established (Urquhart et al., 2019), however, the determinants and moderators of how leadership influences implementation is underdeveloped (Birken et al., 2018). The current research adds to the literature on how leadership activities influence implementation by explaining how motivation is augmented through supportive leadership.

Regardless of the operating procedures and leadership provisions, or the wider person-centred climate, it was proposed in this research that practitioner characteristics impact behaviour change implementation. It was noted that many practitioners were personal trainers and may possess a lack of self-awareness, incongruent motives, and low self-compassion, which may impact their practice of behaviour change. It was also thought these characteristics would augment their response to service planning, training, and supportive leadership, which is outlined elsewhere (Cole-King & Gilbert, 2014). Alternatively, it was shown in this study that some practitioners were able to overcome the lack of behaviour change focus and engage in self-development when they were cognizant, driven, and had the freedom to act on their motives.

Lastly, integration with established communication channels, between medical professionals and practitioners, was found to influence the motivation and capability of practitioners to implement behaviour change practices in this research. Integration augments motivation when there is a community of practice for behaviour change and practitioners perceive that medical professionals' value ERSs. The need for team

networks and integration is known to augment motivation in practitioners and support evidence based practice (Rycroft-Malone et al., 2013). Communities of practice refer to a group of people who all have an authentic interest in a similar problem and interact to learn from each other (Pyrko et al., 2017). Alternatively a lack of communication with GPs, GP scepticism and lack of interest in a programme, and limited shared ownership, decreases implementation which is confirmed by other research (Nazareth et al., 2002).

4.11 Conclusion

Three theory areas were developed during this phase of the thesis, from the focused ethnography that was undertaken. Operating procedures is a term that encompassed protocols and support that practitioners can refer to and abide by in practice. For these provisions to activate motivation and capability mechanisms two aspects of contexts were unpicked. Firstly, the organisational culture must be congruent with behaviour change practices. Secondly, the practitioner's characteristics must be conducive to a person centred approach. Integration with medical professionals was outlined as being a fundamental aspect of practitioner motivation and collaborative learning opportunities, within the context of a community of practice, were identified as being important. Furthermore, the integration of health professionals was unpacked to propose that where GPs act as a champion for implementation, and there are established communication channels, it would increase the motivation to implement behaviour change. Staff spoke at length about the need for clear commitment, behaviour change knowledge, and value of ERSs schemes from GPs for these communication channels to influence motivation. Lastly, within the organisational facets of culture already outlined, the role of a manager was refined to propose the elements that would alter the motivation of practitioners. Where leaders have behaviour change conducive values, are knowledgeable and act as a role model for practice, expect a certain type of practice, and support personal development, motivation of staff will improve.

4.12 Next Phase of the Thesis

Realist evaluation requires empirical testing of programme theory to pursue validation of theory, adjudication of theory, and move closer to reality (Williams, 2018). Mining mechanisms and building theory, as undertaken here, requires qualitative methods as

depth ontology states that mechanisms are real but hidden and powers can be latent depending on context (Jagosh, 2020). However, the manifestation of programme theory will be observable in the empirical realm. Therefore, the use of multi method research in realist evaluation is encouraged, as observing outcomes and validating theory is a quantitative endeavour (Hawkins, 2016).

Testing programme theory usually relies on purposeful sampling of cases, informed by programme theory, to corroborate or refine the initial CMOs. This is typically undertaken through case study methodology which may hamper the completeness and transferability of the theory (Ravn, 2019). Capturing the outcome of interest across a wider population increases the strength of the research claim. Conversely the use of direct observation is typically seen as the gold standard to measure the quality of care, which may decrease the opportunity to include a large sample of diverse ERSs practitioners. Nevertheless, recent evidence has highlighted that there is no superior method to capturing implementation outcomes (Aujla et al., 2020). Moreover, direct observation is expensive, time consuming, involves a high level of burden, requires specific ethical considerations, and is difficult to implement (Evans et al., 2015; Peabody et al., 2004). Direct observation is also not without challenges to validity due to the 'Hawthorne effect' and researcher interpretation. It is argued that alternate methods can provide distance and control, decreasing these influences (Veloski et al., 2005).

Therefore the testing of programme theory in this thesis will employ a realist survey, and embedded practice vignettes, to measure practitioners' behaviour change practice by responding to authentic scenarios. The survey will also examine practitioners' level of agreement with the initial programme theories. The survey will request clarification/ explanations for the level of agreement providing data on mechanisms. Realism and realist evaluation require their own set of quality criteria, due to their distinct assumptions about reality and how to capture it (Pawson, 2013; Wiltshire, 2018). The following chapter, however, aims to produce a measure that can capture practitioner decision making and behaviour which deals with the outcome element of the realist mantra; therefore, it will align with more traditional views of validity when developing the survey and vignettes (Evans, et al., 2015). In line with the broad realist underpinnings, a unified conceptual framing of validity is useful. Through this lens the properties of the instrument, and the theory that underpins it, are of

interest. The responses, interpretations, and inferences are subject to validation (Messick, 1995). Therefore, it is not the aspiration to develop a valid measure of an underlying construct, but it is the responses and inferences that require validation (Hublely & Zumbo, 1996). The next stage of the thesis is to transfer the programme theory into a robust survey and establish construct validity for the survey and a menu of practice vignettes.

Chapter 5: Developing, and pretesting, a mixed methods survey to test programme theory

5.1 Chapter Overview

The following chapter presents the development and pretesting of a mixed methods survey, which was introduced in Chapter 3. The survey includes a section that pertains to the programme theory, developed in Chapter 4, and a practice-based scenario section to capture the utilisation of behaviour changes practices in ERS practitioners.

The relevance of using a mixed methods survey within a realist evaluation is initially outlined, describing the role of surveys in testing programme theory, and the need for pretesting. The conceptualisation of validity for this phase of the research, and its congruency with a realist philosophy, are subsequently discussed. The chapter then documents the multistage process undertaken to develop, and pre-test, a mixed method survey to provide a tool for theory testing in Chapter 6.

5.2 Chapter Introduction

Despite mixed methods being encouraged in realist evaluation, research has largely relied on qualitative approaches for developing and testing programme theory (Pawson, 2013). This may be partly explained by the challenge of measuring complex social outcomes in a quantitative manner, and the lack of specific outcomes having established psychometric properties (Hawkins, 2014). Posing programme theory in a mixed methods survey holds promise for testing programme theory (Mukumbang, 2021), as it can support capturing patterns of outcomes, their relationships with programme theory, and the opportunity to extend correlational data with explanatory information (Ravn, 2019; Schoonenboom, 2017).

Events in realism, are the result of the actualisation of mechanisms, contingently determined by contexts, in ways that give rise to patterns of outcomes. These may be referred to as demi-regularities (Lawson, 1997). Realist evaluation aspires to explain these demi-regularities; therefore, it is prudent to measure patterns of observations, to support the testing of claims about how events are produced (Mukumbang, 2021). The outcomes of interest for this study are the extent of behaviour change practices utilised by ERS practitioners. Of relevance to the final stage of this thesis was the

interest in recruiting practitioners from variable settings, to widen the scope of theory testing and seek alternative theories about how mechanisms exert influence on the implementation of behaviour change practices in ERSs, thereby increasing the legitimacy of programme theory (Ravn, 2019).

It is, arguably, essential to present programme theory for confirmation or refinement, and seek alternative explanatory ideas, to link patterns of outcomes to theories about hidden mechanisms (Schoonenboom, 2017). It is paramount in realist evaluation to subject programme theory to falsification and '*explain why the empirically recordable looks and behaves in the way it does*' (Tilley, 2018, p.5). The proposal of programme theory is less about quantifying patterns, as realism values each account of phenomena as a legitimate alternative explanation of reality (Pawson, 2013).

Nevertheless, it is important that the elements of programme theory proposed in the survey are interpreted as intended and stimulate a cognitive response that retrieves information prudent to the survey items. Formal pretesting of surveys enhances the confidence that questions will initiate responses to survey items as intended (Buschle et al., 2022; Mellinger & Hanson, 2021). Validity is often discussed by researchers during survey designs and pertains to the '*quality and rigour of research*' (Zachariadis et al., 2013, p858). Alternatively, validity in this thesis pertains to the accounts and conclusions drawn from data and not the method itself (Maxwell, 2012). It has been suggested that despite the dichotomy between qualitative and quantitative views on validity, there are three distinct categories of validity that are common across research paradigms (Maxwell, 2012; Venkatesh et al., 2013). The specific modifications to conventional views of validity, across the three distinct categories, adopted in this phase of the thesis, are outlined in Table 5.1.

Table 5.1. The specific realist perspectives on various aspects of validity (Ronkainen & Wiltshire, 2019; Zachariadis et al., 2013)

Validity category	Qualitative labels	Quantitative labels	Realist perspective
Design validity	Descriptive validity Credibility Transferability	Internal validity External validity	Empirical events are a manifestation of unobservable mechanisms. The need to separate and scrutinise each aspect of theory is essential. The work must consider the accuracy of the data generated and execution of the research.
Measurement validity	Theoretical validity Dependability Consistency Plausibility	Reliability Construct validity	The work should measure intended mechanisms and their link to outcomes. Legitimacy of claims can be enhanced by employing realist consistent theoretical frameworks (Chapter 4) and testing theory in partially closed scenarios.
Inferential validity	Interpretive validity Confirmability	Statistical conclusion validity	Statistics can provide useful patterns of data, but they are merely descriptions of relationships. There is a need to consider how to ensure interpretations reflect the perceptions and experiences of respondents.

Practice based scenarios (vignettes) were used in the current mixed methods survey to create a platform to capture the implementation of behaviour change practices by practitioners, the outcome of interest in this thesis (Chapter 6). Extensive research methods, which correspond with quantitative methods, are encouraged to support theory testing as it can help illustrate patterns of outcomes (Danermark et al., 2002). Vignettes are typically brief, hypothetical, purposefully written descriptions of a scenario, created to stimulate the features of an authentic situation (Evans et al., 2015). Vignettes have been shown to perform well compared to more restrictive, and burdensome, measures of implementation (Aujla et al., 2020; Hrisos et al., 2009). This potentially increases their utility as they can be issued within a survey, increasing their potential to reach diverse settings. Vignettes are an accepted tool to simulate clinical decision making, and measure practitioner behaviours, the outcome of interest in this thesis (Antes et al., 2020; Evans et al., 2015; Hrisos et al., 2009; Peabody et al., 2004).

Within the mixed method survey in this thesis, a think aloud approach was used to answer the vignettes. The think aloud model requested respondents to provide a continuous '*verbalised thought stream*' (Eccles & Aarsal, 2017, p.514) in response to reading a vignette. Think aloud responses can provide an accurate report of individual cognitions, if the conditions of the elicitation are optimal (Birch & Whitehead, 2020). Furthermore, a think aloud approach provided the opportunity to capture practitioners' choice of BCTs, but also their commitment to PCC and ability to target salient psychosocial impediments to change. The limitations of closed responses to vignettes have been highlighted (Antes et al., 2020), and think aloud approaches provide the ability to capture practice, skills, and rationale for clinical choices (Eells et al., 2005; Peabody et al., 2004), prudent to the current research question.

Think aloud responses can be, and usually are, analysed by coding verbal text to measures of performance (Eccles & Aarsal, 2017). In line with how behaviour change practice is conceptualised in ERSs (Chapter 4), two established competency frameworks were adopted to appraise practitioners' behaviour change practices. The Behaviour Change Counselling Index (BECCI) is a one pass competence checklist used to measure an adapted form of MI (Lane et al., 2005). The BECCI has 11 items across four domains including, agenda setting and seeking permission, the how and why of behaviour change, the conversation, and talking about targets. Each item is

scored 0-4, with higher numbers indicating more frequent and appropriate person centred counselling. The total number is averaged to approximate practitioner competence in behaviour change counselling. The BECCI has been shown to be a valid and reliable measure of person centred counselling in ERS settings (Beck et al., 2016; Lane et al., 2005).

The second competency framework used is the Behaviour Change Technique Taxonomy (BCTTv1). The taxonomy is a menu of 93 unique behaviour change strategies which has undergone testing to specify and formalise a nomenclature for behaviour change interventions (Michie et al., 2011). The taxonomy was used to quantify the volume of appropriate strategies each practitioner utilised. Since its inception the BCTTv1 has been shown to be a reliable tool to assess practitioner's implementation of behaviour change strategies (Scott et al., 2020). A menu of appropriate BCTs was developed for each vignette, by taking each practice based scenario and embedding specific psychosocial impediments to change. The *'theory and technique tool'* provided a portfolio of which BCTs can augment specific theoretical impediments to change (Carey et al., 2018). The application of the BECCI and the BCTTv1 allowed think aloud survey responses to be generated into quantitative summaries of behaviour change practices in ERSs.

The vignettes, and their subsequent results, only represent the manifestation of mechanisms and do not explain how implementation is influenced. The purpose of the realist element of the mixed methods survey was to present programme theory to practitioners, for them to indicate to what extent they feel aspects of programme theory apply to them. It is paramount to consult respondents and integrate explanatory ideas with patterns of outcomes (Lusted, 2018; Ravn, 2019). Intensive, or qualitative methods, are important to refine programme theory and examine the subjective experience of mechanisms in action (Lusted, 2018). In addition to the vignettes, causal statements needed to be presented to practitioners to test the legitimacy of programme theory. Each of the programme theories was unpacked into its constituent parts and presented as testable statements for respondents to outline their level of agreement/disagreement. Respondents were required to clarify why they gave a specific response, to refine the correlation model and provide a realist model of explanation (Schoonenboom, 2017).

In realist terms pretesting aspired to ensure that the final collection of data would be free from error, that mechanisms could be interpreted and measured as intended, and that data generated could discern the necessary and contingent aspects of programme theory (Porter, 2007; Zachariadis et al., 2013).

5.3 Views of Validity for the Realist Survey

Correlational models *assume* causal association and individual experiences are not considered. Whereas realist enquiry pursues explanation by consulting with respondents from a specific group (Schoonenboom, 2017). The realist '*teacher learner*' interview is a common tool which aspires to unearth mechanisms. The goal of the realist survey, conversely, is to refine the correlational model, test causal ideas, and provide a group level summary of explanatory relationships between patterns of outcomes and programme theory (Schoonenboom, 2017).

Due to the interest in consulting respondents on their experience of a mechanism, the formulation of the survey questions must formally evaluate the populations' interpretation of the survey questions (Schoonenboom, 2017). For realists measurable patterns of events, and relationships between factors, are not evidence of generalisable causal laws, refuting typical views of internal validity (Zachariadis et al., 2013). Moreover, portable causal ideas, or external validity, are only valid when there is confidence that the events arising in other settings are due to the activation of hypothesised mechanisms and linked contexts (Maxwell, 2012). Therefore, the degree of '*external validity*' relies on elucidating people's experiences of mechanisms and capturing information about context.

The proposed elements of programme theory should be presented separately to ascertain if '*necessary*' factors are activated when purported contextual factors are present, or if other competing causal components exist (Zachariadis et al., 2013). From a qualitative perspective the design of the survey should consider the descriptive validity and credibility of the data retrieved. In this way the survey should be confident that respondents claims are accurately collected (Zachariadis et al., 2013). The central tenets of measurement validity, for the realist survey, pertain to the legitimacy of the proposed theory concepts and their relationships (Maxwell, 2012). The construct validity of the realist survey is about its ability to represent the purported mechanisms that may exist. The realist survey provides partial closure to legitimise and adjudicate

ideas (Porter, 2015), supporting the theoretical validity, plausibility, and dependability of the data (Zachariadis et al., 2013).

5.4 A Unified View of Validity for Generating Practice Vignettes

Although not solely a realist task, the vignette development adopted a unified view of validity, which is congruent with realist thinking (Hammersley, 1995). Through this lens the properties of the instrument, and the theory that underpins it, are of interest and the responses, interpretations, and inferences are subject to validation (Messick, 1995). Therefore, it is not the aspiration to develop a valid measure of an underlying construct, but it is the responses and inferences that require validation (Hubley & Zumbo, 1996). Or in realist terms, the validity of an *'account is inherent, not in the procedures used to produce and validate it, but in the relationship to those things that it is intended to be an account of'* (Maxwell, 2012, p.130).

Initially, the vignette construction was based on guidelines from previous research, which outlined considerations to maximise validity (Bradbury-Jones et al., 2014; Evans et al., 2015; Peabody et al., 2004; Skilling & Stylianides, 2020) (Table 5.2). In addition to this guidance, adopting a unified validity lens put construct validity as a focal point. The development of the vignettes developed here covers content, substantive, internal structure, and external aspects of construct validity.

Firstly, content validity requires the researcher to articulate the constructs in the survey as clearly as possible by developing a precise, detailed conception, of that construct. This is an essential step as without a theoretical underpinning the constructs, and inferences made by respondents, are meaningless (Messick, 1995). The constructs embedded in the vignettes are the various psychosocial impediments to PA change for ERS attendees, which were defined by an overarching theory (Atkins et al., 2017; Michie et al., 2011). This provided clear, and tested, definitions of each construct which, was embedded within the vignettes.

Table 5.2: Guidance which informed the development of the practice vignettes

Area	Characteristic	Process adopted
Conception	Content source Level of authenticity Purpose	Previous attendee personas (Speake, 2019), established frameworks (Carey, et al., 2018), and personal experience were used.
Design	Presentation Length Accessibility Questioning style Piloting	Standard format, up to 200 words, coverage of key medical, personal, and psychological information of the individual was provided. Mimics the information which would be sought during an initial assessment. The profiles developed from various stakeholders ensuring the familiarity was high. Reading score tests were undertaken to increase accessibility. Piloting was undertaken to increase the representativeness of the scenarios and practitioner perspectives.
Administration	Instructions Timing Delivery mode	Think aloud demonstration and practice task were provided in the instructions. The delivery used both interview and online formats. Random allocation of vignettes was adopted to decrease a learning effect.

The substantive element of Messick’s construct validity relates to how the respondents formulate and develop answers based on the presentation of the vignettes (Messick, 1995; Windt et al., 2018). Typically, the responses and scoring of items are then examined for their structural validity, to check if measurement is in line with constructs of interest. The focus here is on the vignette itself and how people respond to the scenarios presented to them. Other authors have developed scoring systems and

closed options to respond to vignettes (Antes et al., 2020). Nevertheless, in this thesis adopting closed scoring was seen to decrease the value of the vignettes, which have the potential to capture holistic responses on how people make decisions in practice (Peabody et al., 2004), namely how practitioners decide on a suite of behaviour change strategies and portray PCC. Therefore, the current vignettes used a think aloud approach to capture responses and then scored the verbal reports using the BECCI and the BCTTv1, which have established structural validity that correspond to the constructs within the vignettes. Lastly, external aspects of construct validity relate to the vignette's correspondence to other variables (Messick, 1995). Criterion related validity was examined by identifying practitioners who scored well during direct observation (previous research) and seeing if successful implementation of behaviour change practice was replicable in their vignette performance.

5.5 Ethics

Due to the COVID-19 pandemic the original ethical clearance required amendment. An application was made to St Mary's University institutional ethical panel to augment the original study design. The original ethical approval permitted case study research which would have involved going to ERSs, however, due to the COVID-19 restrictions, travel and close contact were restricted. In addition, many ERSs closed during the pandemic or shifted their practice, making case study research difficult. The subsequent survey development and theory testing phases were approved by the university panel.

5.6 Participants

Pretesting involved multiple procedures (see below), but consultation with ERS practitioners and behaviour change experts was paramount. An equal recruitment of ERS practitioners (n=8) and behaviour change experts (n=8) was obtained. Inclusion criteria was open, and any practitioner could take part if they had experience of supporting those with a LTC to become more physically active as part of a scheme that had a medical referral element. Practitioners were recruited through convenience sampling, whereby those with relevant experiences chose to self-select themselves to participate, once they were aware of the research. This can be a useful strategy to get the population of interest's feedback on surveys, and other non-hypothesis testing study designs (Stratton, 2021). Behaviour change experts were eligible for

participation if they were registered psychologists or applied behaviour change academics. Behaviour change experts were recruited through snowball sampling, whereby experts were referred to participate from experts who had taken part.

5.7 Methods: Realist Survey Development

The aim of pretesting the realist section of the mixed methods survey was to ensure the programme theory could be interpreted as intended, collect information in an accurate manner, and initiate responses that related to each aspect of the theory areas. More specifically, that each item pertaining to the context and mechanism within behaviour change operating procedures, supportive leadership, on-going support, and partnerships with medical professionals could retrieve useful information.

5.7.1 Formulation of Realist Statements

Before the realist survey was subject to interpretation checks, the programme theory needed to be arranged into statements for each of the theory areas, which would allow respondents to object or confirm specific elements within each. Importantly, each element from the programme theory needed to be subject to falsification (Schoonenboom, 2017). In other words, future respondents needed to have the opportunity to agree/disagree with the hypothesised mechanisms, and the envisaged context that shapes outcomes (Zachariadis et al., 2013). Figure 5.1 provides an illustration of the statements that were initially generated using 'behaviour change operating procedures' as an example. The same process was undertaken for all theory areas proposed in Chapter 4.

- Hypothesis 1: Supportive organisational procedures have an influence on implementation **only** when it augments motivation.
- Hypothesis 2: Supportive organisational procedures have an influence on implementation **only** when it augments capability.
- Hypothesis 3: A person centred climate is the **necessary condition** to activate changes to motivation/ capability via supportive organisational procedures.
- Hypothesis 4: Supportive organisational procedures influence implementation **unrelated** to changes in motivation.
- Hypothesis 5: Motivation influences implementation **unrelated** to organisational support.

Figure 5.1 An example of the statements produced, to capture the proposals within programme theory, which could inform the generation of survey items

Once the programme theories were formulated into testable statements, they were translated into survey items which contextualised programme theory into a familiar language for respondents. The initial statements, and survey items, were sent to Judith Schoonenboom to ensure the arrangement of survey items corresponded with the realist survey approach, and that the items had sufficient coverage and accessibility to test programme theory. Minor adjustments were made, relating to the accessibility of survey items, and the complexity of the statements (Appendix B). Using the example provided earlier Figure 5.2 outlines how they were translated into survey statements.

- If organisational planning (e.g. behaviour change manuals, behaviour change protocols) does not increase my motivation, I will not implement behaviour change practices regardless of the amount of supportive planning that is present.
- If I am not expected to use behaviour change practices, organisational planning (e.g. behaviour change manuals, behaviour change protocols) will not alter my motivation, meaning I will not implement behaviour change practices.
- If I am not personally committed to use behaviour change practices, organisational planning (e.g. behaviour change manuals, behaviour change protocols) will not alter my motivation, meaning I will not implement behaviour change practices.
- If I get organisational planning (e.g. behaviour change manuals, behaviour change protocols) then I will use behaviour change practices, regardless of how it impacts my motivation.
- If I am motivated to, I will implement behaviour change practices, even if organisational planning (e.g. behaviour change manuals, behaviour change protocols) is not present.

Figure 5.2. An example of how realist statements were translated to survey items

The instructions for responding to the statements borrowed from other realist survey research (Schoonenboom, 2017), and initially asked, ‘to what extent does this statement apply to you’. A scaling response was presented with four options namely: not at all, not really, somewhat, completely. Each response had a mandatory open text box which asked, ‘please clarify/explain your answer’ to provide confirmation and extension of CMOs, or alternative causal configurations not previously considered. Respondents could type in this open box, or audio record their answer using a voice note function.

The initial realist survey had 16 survey items covering four theory areas rather than the three proposed in Chapter 4 (Appendix C). Behaviour change operating

procedures was seen to include two separate areas, both organisational protocols and on-going training. An introductory page was also produced, which outlined the aim of the realist survey, the expectations of respondents, and the definitions of motivation and capability adopted within this thesis.

5.7.2 Cognitive Pretesting

The survey items required checking to ensure responses to questions would be comprehensible, initiate adequate retrieval, and produce a formulated response that was fit for purpose (Buschle et al., 2022). Cognitive interviewing, or more specifically, a think aloud approach was adopted to uncover thought processes and interpretations of the realist survey items (Gardner et al., 2020; Mellinger & Hanson, 2021). The think aloud procedure invited members of the respondent group into a partnership to identify issues with survey items. Essentially, interviewees were guided to '*say anything*' that came to their mind when reading, and formulating responses, to illuminate issues with the preparation of survey items (Buschle et al., 2022, p.825).

Nine ERS practitioners took part in the think aloud pretesting, however, one participant did not complete the full survey due to other commitments. Recruitment was undertaken through personal contacts via email or face to face invitations. A time, format (virtual or in person), and location was agreed upon together to schedule the interview. Eight think aloud interviews took place during June and July 2021 (55.3 ± 11.9 minutes), with two taking place through Microsoft Teams. Prior to data collection, written informed consent was granted, in which a verbal discussion of the research, its aims, the expectations of the research, and data processing and management procedures were explained.

During the introduction to the interview, interviewees were briefed on the think aloud approach, an example was discussed, and a practice task was undertaken (Birch & Whitehead, 2020). The draft survey questions were presented to interviewees, and they were instructed to complete the survey as normal but articulate their thought processes during survey completion. Several prespecified and emergent probes were used to ensure each aspect of the survey was considered. The use of probes was organic and think aloud processes were never interrupted. Key probes included a) what does that mean to you in your own words? b) what is this asking of you? c) how

did you come to that answer? d) what are the instructions asking from you? (Willis, 2005).

The interviews were audio recorded and transcribed verbatim through Otter.ai which was checked for accuracy by listening to each audio file while reading the generated transcript. Memos were made, and time stamped, during the interviews when issues with the realist survey were noted. In conjunction with the memos, the audio files and transcriptions were analysed, which involved consulting each issue in situ and generating and recording resolutions. In most cases, the partnership approach provided interviewee led solutions that were captured in memos and the transcripts. Each issue was approached with four broad analysis schemas: comprehension, retrieval, judgment, and response (Buschle et al., 2022). After each interview, suggestions were analysed and attended to, creating an iterative evolution of the realist survey. By the eighth interview only minor issues relating to the phrasing of the survey items remained. The changes to survey items then required crosschecking with the original testable hypotheses (Figure 5.1 as an example) to ensure the ideas still corresponded to the proposals within programme theory. Lastly, once modifications had been made the survey was subject to a Flesch readability score within Microsoft word to examine the accessibility of the final survey. The scale ranges from 0-100, with a higher score indicating ease of reading (see results below) (Calderon et al., 2006).

5.8 Methods: Practice Based Vignette Development

The aim of pretesting the vignettes was to ensure the practice based scenarios were interpreted as intended, were authentic, and that the well-defined theoretical constructs were evident in the construction of the scenarios.

5.8.1 Generating the Pool of Vignettes

The initial vignettes were based on personas of sedentary people who attend health services. The profiles were empirically developed through a literature review and co-production using experts, practitioners, and service users (Speake, 2019). The resulting personas were representative of real people and provided a holistic outline of typical service users. Characteristics of background, cognition, medical history, and practical concerns were created. Inductive persona labels were also generated

highlighting the values of the individual, and their barriers to PA behaviour change (Speake, 2019).

The personas provided inspiration, which was combined with personal experience, to populate the initial narratives for five contrasting vignettes. In addition, the *'theory and technique tool'* was consulted to examine explicit theoretical links to the personas, and appropriate BCTs. Personas were either aligned with established psychosocial barriers, or slightly amended to satisfy the definitions within the theory and technique tool which is underpinned by COM-B (Carey et al., 2018). Due to the explicit focus on attendee's 'readiness to change' in ERS policy (NICE, 2014), language was included indicating what stage of stage each vignette was in, which was also aligned with specific impediments to change from the *'theory and technique tool'* (e.g. if in precontemplation there would be a corresponding lower belief about capability and lack of belief that inactivity had adverse consequences). Lastly, the holistic information was arranged in a standard format and written in a manner that provided opportunities for practitioners to demonstrate person centred counselling which was informed by the BECCI (Lane et al., 2005). Appendix D outlines the five initial vignettes, the persona characteristics, the associated impediments to change from the COM-B, and the expected BCTs from the theory and technique tool. Figure 5.3 is one of the initial personas which provided the inspiration for the vignettes prior to embedding a theoretical underpinning, generating the personal narrative, and aligning specific BCTs to the personas from the theory and technique tool (presented with permission from Dr Helen Humphreys nee Speake).

5.8.2 Cognitive Pretesting

Ten behaviour change experts were invited to take part in the pretesting, and eight agreed to undertake a think aloud interview (42.1 ± 9.4 mins). Experts were all registered psychologists, except one who was an ERS behaviour change academic. An initial email with the study information and subsequently a date, time, and format for the interview was decided. All eight of the expert interviews were undertaken through Microsoft Teams. Written informed consent was obtained prior to any data collection, as outlined previously.

During the introduction to the interview, the experts were informed about the purpose of the interview, the wider research aims, and the think aloud approach. An example

think aloud exercise was shown and a warmup task undertaken. The experts were encouraged to think aloud when reading the instructions to examine if the wording could evoke ERS practitioners to outline their counselling style, the identification of prudent psychosocial barriers to PA behaviour change and summarise their use of BCTs. The main request during the interview was for the experts to think aloud when reading all five vignettes and identify the theoretical constructs they noticed in the vignettes. The expert panel were also asked to consider the vignette for aspects of relevance and appropriateness as a tool to capture ERS practitioner's use of behaviour change practices.

As outlined previously outlined, the interviews were audio recorded and transcribed verbatim through Otter.ai. Analysis from this phase had two main elements 1) where issues were noted through memos, the same analysis procedure outlined above was adopted, which was applied when the experts read the instructions for the vignettes and 2) segments of transcripts were coded using the TDF within the COM-B where behaviour change experts recognised, or introduced new, barriers to behaviour change within the vignettes. All written feedback from practitioners was actioned and there were no contrasting comments.

Bob

"low confidence in physical ability"



Age: 55-65

Marital status: Married

Occupation: Works part-time as a driver

What is most important to Bob?

"Staying young! Or at least ageing well"

Needs and Motivations

Believes that physical activity is clearly linked to health outcomes

Needs reassurance and advice on how physical activity can be done safely within the limits of his condition

Frustrated about the number of health conditions he has to deal with and the number of appointments and different services he has to attend

Things to bear in mind:

A lot of movement or overdoing it can sometimes cause pain and immobility

Low confidence in his physical health and worried about future deterioration

Low mood - lost the motivation to do things he used to enjoy



Comfortable financially



Lots of free time in the afternoons and evenings

GOALS

Bob is worried lately that he is 'falling apart' and thinks it is now or never to take charge of his health. He wants to be able to do more without pain and get back to moving about comfortably.

Bob does not like the fact that he has to ask other people to do things for him at home like decorating his new extension and gardening. He would like to be able to do some of these jobs himself.

Figure 5.3. One of the personas that shaped the generation of the vignettes for the current thesis

5.8.3 Data to Satisfy Messick's Framework of Unified Validity

Content validity judgements were enhanced as the initial personas were based on stakeholders' actual interpretations, by using theoretical frameworks, and by undertaking think aloud interviews with behaviour change experts. These tasks are routinely seen as robust procedures for generating vignettes (Tremblay et al., 2022).

Substantive validity sought to establish how and why respondents arrive at their answers and how the vignettes format influences this. The think aloud procedure with the ERS practitioners also explored the instructions, format, and content of one random vignette. Conversations focused on how to ensure the vignettes, and instructions, stimulated respondents to articulate their thought processes and behaviour change practices. Practitioners were also asked to provide written feedback on the four other vignettes focusing on (Evans et al., 2015):

- Clarity- Were you able to respond to the instructions? Is the language clear? Is the structure accessible?
- Representativeness- Is the content, character, and situation like actual practice?
- Relevance- Does the content allow you to outline your practice, and can you notice differences between the situations?

Although the think aloud interviews were primarily examining if the content was relevant and representative of the theoretical models, due to the format of the questioning, many of the behaviour change experts undertook the task of developing a case formulation, providing additional evidence for substantive validity.

The vignette instructions requested people to think aloud their thoughts on how they would interact, what barriers they noted as important, and the strategies they would utilise to support behaviour change. Therefore, there was no scoring system to examine for internal structure.

Survey constructs should correspond with other related variables, which should be tested using entrusted measurement tools or performance ratings issued by supervisors (Andler et al., 2020). Two practitioners who were identified as scoring well on formal observations in another study, did participate in the current phase of the

research. Their supervisor's recommendation provided the opportunity to corroborate actual practice with vignette performance.

5.9 Results

5.9.1 Refining the Realist Survey

Early think aloud interviews uncovered issues with the accessibility, complexity, and ability to respond to the realist survey. Several reoccurring features were noted as the pretesting evolved (Table 5.3). An initial issue was the preparatory information in the introductory page of the survey. The preamble attempted to situate the survey within the research aims, explain realist testing, and provide definitions of behaviour change practice, motivation and capability. Practitioners struggled with comprehending the definitions but paradoxically, requested definitions to provide clarity on terminology. The information page was substantially changed to ensure the bare minimum was included to provide background to the work but keep the focus on the expectations about their involvement (Appendix E).

Another issue highlighted by ERS practitioners was the hypothetical nature of the statements in the survey items. Many resources highlighted in programme theory were alien to practitioners and their automatic cognitions could not envisage the impact of specific resources. An additional survey item was introduced for each of the programme theories which first asked about practitioners' access to important conditions and resources, as outlined in programme theory, for example, 'I have a supportive manager (e.g. role model, allocation of time) who focuses on using behaviour change practices'. Respondents were then asked to elaborate or ruminate on aspects of programme theory depending on their circumstance. This additional set of survey questions was also important to examine if those who were exposed to proposed conditions and resources in programme theory achieved greater implementation scores (Chapter 6).

Many of the terms used, in both the survey blurb and the realist statements, were perceived as vague and interpreted in a broad manner. The labels from the CFIR were abstract and insufficient for practitioners to comment on. Terms like 'organisational procedures', 'partnerships', 'culture', and 'leadership' were interpreted in a diverse manner, threatening the ability of the survey to test programme theory in Chapter 6.

The addition of examples, posed in brackets, helped to orientate respondents as the survey became more refined.

An important aspect of theory testing was to provide the opportunity to falsify each element of programme theory i.e. the specific contexts, resources, and proposed changes to reasoning. Many of the survey questions were judged as repetitive by the respondents. Although each survey item had a specific purpose, to falsify the causal configurations, respondents struggled to see the distinction of each statement. Several iterations removed items that looked repetitive, as it was found that during the think aloud interviews one question sufficed to initiate explanations which covered all aspects of each theory area. Finally, grammar and structural issues were identified which decreased the accessibility of the survey. Language used was deemed esoteric, and discussions provided clarification of points and recommended linguistic changes.

Table 5.3. Key findings from the think aloud interviews

Issue	Example extract	Amendments made
Comprehension of the purpose of the survey	‘Okay, so I'm not sure what you're asking here, are you asking me to relate my experiences to these motivation and capabilities?’ I don't think until I've done it, perhaps, it won't make sense' (Interviewee 3)	Simplified introduction
Interpretation of language used to define key resources	‘...but I thought that oh, you know, like, we should have an induction and it should last this long and those kind of standard operating procedures instead of specifically the behaviour change stuff’ (Interviewee 7)	Used linguistic suggestions
Judgment of realist statements	‘I had to re-read it a few times, that's fine. Oh, that's the same one Oh, no, that one is; it's likely to; and this one is, it motivates me’ (Interviewee 4)	Removed burdensome items
Accessibility of the realist statements	Okay, so what you're saying is that whatever I'm reading (in the manuals) needs to make me more motivated in order to, for me to use them? In my practice? That's how I'm reading that, but it's, um, my brain is not working at the moment, but it took me a few times scanning that to get that I think it's that however bit at the front? (Interviewee 7)	Consolidated realist statements into easier prose

No contradictory feedback was received across the interviews and where uncertainty was uncovered by interviewees, and no obvious solution discussed, it was posed to subsequent interviewees for comment and resolutions emerged from the process.

Once pretesting was completed, an additional survey question was added, prior to the realist survey, which asked respondents to explain, from their experiences, what influences their application of behaviour change practices (with definitions provided). This was added, to validate theory in an unsolicited manner, or unearth inductive elements of theory across a wider cohort of people. It was seen during the pretesting that people were fluent in describing the challenges to implementation, and this question provided the opportunity for practitioners to comment openly, not influenced by the realist statements that were included.

Each of the four theory areas (behaviour change operating procedures, supportive leadership, on-going support, and partnerships with medical professionals) were represented in the realist survey, with six propositions each. The additional of questions pertaining to practitioner's access/experience of core features of programme theory increased the original number of 16 to 25. Figure 5.4 provides an example of the finalised realist statements from the illustrative example above.

Please answer the below statements regarding your current, or recent, experience of working in exercise referral. **If you do not have some of the elements in your work, please think how they would impact you.** Some of the statements look similar, therefore the important part of each is in bold to show the differences.

1. Service level protocols

- a) I work in a service where **I have a framework for my behaviour change practice (e.g. manuals, procedures).**
- b) If I have a behaviour change framework **it is likely** I will use behaviour change practices.
- c) A behaviour change framework **must** improve my motivation (e.g. beliefs, habits, emotions, intentions, identity) if it is to influence my behaviour change practices.
- d) A behaviour change framework improves **something other than** my motivation triggering me to use behaviour change practice.
- e) **I work in** an environment where there is a commitment to support long term behaviour change.
- f) A behaviour change framework will help **only** when the environment (e.g. organisation expectations, staff commitment) is focused on long term behaviour change.
- g) **If I am motivated,** I will use behaviour change practices even if a behaviour change framework is absent.

Figure 5.4. An example of final realist survey items after pretesting

5.9.2 Refining the Vignettes

All written feedback from the ERS practitioners, and the issues highlighted from these interviewees, was attended to prior to the interviews with experts. All ERS practitioners provided feedback on the vignettes and minor changes were made and encapsulated in the final vignettes, however, no changes to content were suggested (Figure 5.5).

Bob is a 70-year-old who works part time as a driver for kids with disabilities. He lives with his wife, and they are financially comfortable and time rich. He gets frustrated at the number of medical appointments he must attend. He is an independent man who likes to take control. His health and decreasing capability are giving him a feeling of hopelessness. Bob has COPD and mild depression. Bob believes physical activity would be good for him but is terrified of overdoing it and does not have a good understanding of exercise. He thinks it is now or never to take control over his health. He is open to advice but has lost faith with the medical profession. He has had issues with health professionals not communicating with each other or him. He wants to become more active but does not know what is appropriate and how to carry out a physical activity plan. He has lost his get up and go due to fear, low mood, and worsening mobility. He says he is open to meeting new people but lacks confidence in his own physical ability to join in.

Personas (Speake, 2019)	<ul style="list-style-type: none"> • Fear of exacerbation or injury: Terrified of movement and 'overdoing it' • Experience of care to date: Long term problems, several failed interventions, have seen multiple services - frustrated, disillusioned • Ease within a group: Comfortable and open-minded about group settings • Confidence in future health: Pessimistic about health deteriorating • Engagement with idea of PA: Believes that PA is clearly linked to health outcomes
TTM TDF-Evidence based BCTs (weak put present evidence)	<ul style="list-style-type: none"> • Contemplation • Beliefs about capability- Problem solving, instruction, demonstration, rehearsal, grades tasks, verbal persuasion about capability, focus of past success, self-talk (social reward, reduce negative emotions, biofeedback, goal setting). • Knowledge- Biofeedback, instruction, information about antecedents, information about health consequences, information about social and environmental consequences (feedback) • Low optimism- Review outcome • Emotion- Reduce negative emotions (reframing, body changes, information on emotional consequences, anticipated regret) • Intentions- Goal setting, information on health consequences, incentive (commitment, information on others approval, valued self-identify)

Figure 5.5. An example of a final vignette with the embedded psychological barriers to change and corresponding evidence based BCTs.

The expert panel engaged with the vignettes, the think aloud procedures, and the instructions in a fluid manner. Experts with a health background had no issues with articulating the named constructs embedded in the vignettes. Those with an exercise and sport background also recognised key content but did not use established labels from theoretical frameworks consistently.

One vignette was consistently assumed to have an additional construct which had not been intended during the initial development (Appendix D). Due to the consistent

confirmation of the construct it was accepted as a core part of the vignette. A secondary concern with the vignettes, highlighted by the experts, was the level of detail provided. This inclusion of the in-depth information was ironically seen as good behaviour change practice. It was argued that to achieve the level of information from attendees would require good communication skills. Therefore, prior to the vignette, an open question was added which asked respondents to outline their typical behaviour change practice. This was deemed important by the experts as the vignettes provided information in a holistic manner which may prime people to respond in a more nuanced way. The open question could then be cross checked with performance to highlight any large variance in unguided descriptions of their practice versus vignette stimulated descriptions of their practice.

Due to the hypothetical attendance and provision of in-depth information, some experts assumed the less motivated vignettes were more motivated than anticipated in the design of the narratives. Where narratives aimed to show attendees who were reluctant to change optimistic language was decreased, and content outlining resistance to change was heightened. A key finding from the expert panel related to the instructions for the vignettes. The vignettes aimed to capture the implementation of behaviour change techniques, conceptualised in the research as the utilisation of appropriate BCTs, application of person centred counselling, and adoption of a theoretical model. Each expert spent time exploring the format of the instructions and provided feedback on how to guide practitioners to arrange their response in a manner aligned with the research aim. The vocabulary of experts included terms such as 'case formulation', 'constructs', 'models', and 'interventions' and an iterative process was undertaken to adapt these phrases to be accessible to ERS practitioners. The think aloud transcripts, from the practitioners, provided a useful adjunct data source to adjust the wording. The final instructions for the vignettes are outlined in Figure 5.6

Similar to the informal think aloud task, that was used in the cognitive pretesting, there was a formal, written think aloud warm up task prior to the vignettes in the mixed methods survey. The written warm up task was consistently perceived to be difficult to

‘Please read this scenario and **outline what your normal approach would be to support behaviour change**. You can record as you read or return to sections that stand out to you and elaborate on your thoughts. Please use the below to shape your answer.’

A) Imagine the kind of conversation you may have with this person. Describe how you would interact with them to support behaviour change.

B) Summarise the techniques you would use to support behaviour change.

Figure 5.6. The finalised think aloud instructions which preceded the vignettes in the mixed method survey

navigate, lacked relevance, and both ERS practitioners and experts showed issues with comprehension. The guidance about think aloud remained, but the warm up task was removed, which helped engagement.

The well performing practitioners who took part in the pretesting, identified by their engagement with previous training (discussed previously), scored a mean of 2.8 and 1.5 on the BECCI (see scoring system above). Of the envisaged appropriate BCTs the practitioners used 7 and 5 respectively. This highlights that the tool may correspond well with actual practice, as this is higher than reported practice in other ERS practitioners (Beck et al., 2016).

The final survey, including both aspects of the work, had a Flesch Readability score of 58. Evidence encourages public surveys have a score of 60, however, the group of interest for this research require a level 3 certificate to practice in ERS dampening concerns about readability.

5.10 Discussion

This phase of the thesis aimed to develop, and pretest, a mixed method survey to test programme theory in the final phase of this thesis. The objective of this chapter was to translate programme theory into survey questions and generate practice based vignettes to measure the implementation of behaviour change practice in ERS

practitioners. This chapter documents the views of validity which pertain to the current mixed methods survey, and the multistage process adopted to enhance the confidence that the survey would be indicative of actual relationships between the proposals in programme theory and patterns of behaviour change implementation. This process was an essential precursor to testing programme theory in the final phase of the research by aligning with recommendations in realist mixed method survey research (Buschle et al., 2022; Schoonenboom, 2017; Zachariadis et al., 2013).

The realist survey provided a platform to formalise and test programme theory (Ravn, 2019; Schoonenboom, 2017). The use of a priori frameworks was useful to arrange large pools of data and test theory in different contexts (Westhorp, 2012). However, the accessibility of programme theory was poor, as highlighted during this phase of the research. Others have highlighted the challenge with adopting the principles of realist evaluation while tending to the applied needs of those within the area of interest (Adams et al., 2016). Indeed, several methodological debates (Gilmore et al., 2019; Greenhalgh & Manzano, 2021; Shearn et al., 2017) continue and guidance is still emerging. The practical elements of engaging non-initiated people to converse in realist language is rarely discussed. It was a challenge to create accessible and low burden survey items which had integrity to the realist evaluation principles. Moreover, it was challenging for individuals to process mechanisms, which is a general issue within realist evaluation (Rolfe, 2019), which seems to be magnified in a survey design as found during the current pretesting stage. Although realist enquiry assumes individuals are at least partially knowledgeable about their actions (Pawson, 1996), reflecting on the drivers of one's own actions was taxing.

Consolidating complex causal ideas into single statements, which were sequential to each other, was also difficult to achieve in a survey format. This was noticed by practitioners during the initial pretesting as they were unable to comprehend what was being asked of them. The final survey arranged the realist statements in a manner which allowed for testing of multiple facets of the work without asking contradictory or repetitive questions. The qualitative clarifications of survey questions captured alternative mechanisms or contingent conditions without requiring the need to propose each element of theory which was seen as repetitive by respondents. This ensures the survey is less burdensome, can maintain a standard format, and be more comprehensible. Other authors have argued that online qualitative surveys should suit

the needs of the respondents and should be altered to be less burden and unobtrusive (Braun et al., 2020) which has been verified thorough the current phase of this thesis.

The vignettes, which utilised lived experience, co-produced personas, and psychological theory, produced robust narratives that required small adjustments with reference to content validity. The current chapter adds to the call for more explicit and detailed information on how vignettes are developed and validated (Tremblay et al., 2022). The vignettes were well received by the behaviour change experts, who saw their value beyond this thesis. This may be partly explained as vignettes can manipulate key components of scenarios, potentially enhancing their utility for quality improvement tasks (Antes et al., 2020; Evans et al., 2015). Practitioners also commented that the opportunity to reflect on their practice was a fulfilling experience. In ERS practice, evaluation is poor, which may precipitate the lack of fidelity monitoring and hamper practitioner development (Buckley et al., 2018; Shore et al., 2022). The use of these vignettes, for developmental and evaluative purposes, may decrease burden, increase learning opportunities, and provide a robust alternative to more resource intensive approaches (see Evans et al., 2015), which may explain the positive feedback issued from ERS practitioners.

The combination of tools used to generate the vignettes increased relevance and familiarity for those involved in the pretesting. The personas developed from empirical co-productive work, and integrated real-life experiences, are likely to have facilitated this. Others have highlighted that real-life vignettes stimulate engagement, reduce tendency to answer in a socially desirable manner, and facilitate trust (Sampson & Johannessen, 2020). Paradoxically, the application of a behaviour change performance checklist felt reductionist. The authentic nature of the vignettes evoked detailed thought processes from participants about how to interact with people, which may not be captured using the BECCI and BCTTv1. The two practitioners who were used for external aspects of validity provided a think aloud response that concentrated on areas of agency, autonomy, respect, and practical concerns, which were not on the envisaged list of appropriate BCTs. Heino and colleagues (2021) have raised concern about the traditional ways to evaluate behaviour change. It is proposed that current theories of behaviour, and subsequent appraisal of appropriate interventions, rely on assumptions of linearity. Yet, supporting a low self-efficacy, by using graded tasks for example, is unlikely to support behaviour change if someone is unable to leave their

room due to domestic abuse. The current vignettes provided holistic information and practitioners tended to respond to the authenticity and their cognitions were more dynamic and less mechanical than the BCT checklist applied here.

The think aloud procedure provided invaluable learning to refine the survey. The use of immediate memos decreased the degradation of recall and provided detailed, actionable, solutions. The use of analytic memos provided a linked, transparent, and representative technique to refine the survey. This is a widely accepted feature of memos in qualitative research (Kalpokas & Radivojevic, 2022). Although the formal analysis of transcriptions did not align with conventional techniques, the iterative and evolving nature of the survey provided a flexible approach that had high utility.

As discussed elsewhere, the think aloud approach framed the survey pretesting, however, the importance of the partnership between the researcher and interviewee was fundamental during this process (Buschle et al., 2022). Where rapport was built, and a non-judgmental space provided, information gleaned was rich, consistent, and enhanced the survey development. Alternatively, when participants read the think aloud instructions, and warm up task within the survey, for the vignettes, it did not yield the same comprehension as teaching them about think aloud in an interview format. Briefing respondents on how to think aloud is a contentious topic (Birch & Whitehead, 2020) and the generic warm up task for the vignettes, which was arithmetic based, created challenges for participants. Using think aloud in a survey format may require attention, as shown in this thesis, if it can evoke the same richness of verbalisations as an achieved during a facilitated think aloud format. This is prudent as others have encouraged the use of survey based think aloud formats (Power et al., 2017; Wan et al., 2020) which need consideration as self-directed completion and learning how to think aloud seems less accessible in survey format.

5.11 Thesis Progression

The ethnography (Chapter 4) provided emergent, but tentative ideas, about how implementation is achieved in ERSs. The final phase of the research required the empirical testing of ideas and their relationship with the behaviour change practices. The current work preceded theory testing to provide confidence that the programme theory had legitimacy, and the testing of programme theory could be less tentative about inferences and explanations drawn from the data collected from the mixed

method survey. Programme theory elements were refined, and interpretations became more likely to relate to invisible mechanisms theorised as important. Lastly, the vignettes provide a proxy to actual outcomes in the empirical realm. The vignettes were seen as authentic, relatable, and representative of psychosocial impediments to behaviour change.

Chapter 6 outlines the final phase of the research which circulated the mixed method survey as an online data collection tool. Phonic.ai was a software which allowed for think aloud responses of the vignettes to be captured and transcribed. The design increased the ability to recruit practitioners from a range of ERSs settings to test the programme theory developed in from Chapter 4. The benefits of the survey was the potential to compare the strength of agreement with envisaged ideas purported in programme theory with outcomes in the empirical realm (Ravn, 2019). Pretesting was essential to ensure psychosocial constructs were evident, programme theory statements evoked responses as intended, and that inferences made about the legitimacy of programme theory could be more confident that it pertains to actual patterns of outcomes in the empirical realm.

Chapter 6: Behaviour change practices in exercise referral practitioners: Testing programme theory of implementation

6.1 Chapter Overview

The following chapter outlines the final phase of the research, which empirically tested the programme theory developed during the focused ethnography (Chapter 4). The rationale for the forthcoming work, and place within the wider thesis, are first described. The methods employed for this phase of the research are then outlined. Next, the relationships between having exposure to key contexts and resources, as proposed in programme theory, and the implementation of behaviour change practices are illustrated. The level of corroboration with, and refinements to, programme theory are subsequently provided. Lastly, a discussion of the original research contribution is provided by consulting the existing evidence base.

6.2 Chapter Introduction

As previously discussed, PA is important to contemporary health issues, yet research examining effective modes to support behaviour change are lacking (Gray et al., 2021). Moreover, there is a lack of research exploring the implementation of behaviour change practices in fitness professionals (Stevens et al., 2022). This is further complicated as ERSs are not standardised, evolve to local contexts, and serve diverse functions (Oliver et al., 2016). Therefore, it is essential that research is undertaken that is sensitive to the '*context specific differences*' that will exist in practice (Sarkies et al., 2022; Stevens et al., 2022).

The recognition that behaviour change practices are likely to be influenced by contextual factors has implications for research and practice. Implementation research is lacking in PA behaviour change, yet, the recognition of its value to provide insights about what practices are acceptable, feasible, and effective within applied settings is established (Collins et al., 2022). Implementation research has the potential to yield causal and context specific information about how outcomes are achieved (Sobierajski et al., 2022).

Realist evaluation was adopted in this thesis to enhance the understanding, and explanations of, how implementation can be achieved in different circumstances (Sarkies et al., 2022). Mixed methods approaches are encouraged to test programme

theory in realist evaluation, to link theory with evidence, and legitimise some aspects of programme theory while falsifying others, however it remains a rarity in the literature, largely due to the challenges of measuring social outcomes (Bonell et al., 2022; Hawkins, 2014; Mukumbang, 2021). Yet, the researcher must elicit, formulate, and test theory if integrity to realist evaluation is to be maintained (Tilley, 2018). Although quantitatively measuring patterns of outcomes will only ever be an approximation, due the dynamic nature of mechanisms and the existence of multiple mechanisms explaining observable patterns (Pawson, 2013; Williams, 2018), there is a need to examine what works, for whom, in what circumstances, through observations in the empirical realm to adjudicate between rival theories that are associated with the outcomes of interest (Westhorp et al., 2014).

Qualitative approaches in testing realist theory are paramount to advance knowledge '*beyond a string of variables*' with no consideration on how pre-existing conditions and local activities influence outcomes (Bonell et al., 2022, p.168). A qualitative element of theory testing is needed to refine, confirm, or offer alternative configurations not considered. On the other hand, quantitative approaches provide empirical insights about patterns of demi-regularities and how they align with purported programme theory (Zachariadis et al., 2013). Mixed method research, although fallible, can strengthen the evaluation of mechanisms and support the transferability of realist research providing important contingencies which influence the impact of interventions (Bonell et al., 2022).

The current phase of the thesis filled research gaps including both how mixed methods, employed in a realist evaluation, can advance implementation science and how behaviour change practices can be implemented by ERS practitioners. The use of mixed methods aligns with recommendations from Pawson (2013) and the current phase of the thesis measured patterns of outcomes quantitatively and practitioners experiences qualitatively, to test if programme theory was linked to empirical outcomes and explained what hidden mechanisms resonated with practitioners (Bonell et al., 2022). This tested the applicability of the hypotheses in the programme theory as programme theory was subjected to falsification and alternative explanations were sought. The current approach advanced applied realist evaluation by demonstrating the '*gradualism*' of scientific enquiry as outlined by Pawson (2013, p. 100).

There is appetite to advance implementation science but research currently explores context in an insufficient manner and the understanding of implementation processes is underdeveloped (Dryden-Palmer et al., 2020; Lewis et al., 2020). The below work addressed this by testing causal configurations on how resources interact with context, using established frameworks to understand how the implementation setting influenced outcomes. The original contribution to the ERSs lies in advancing knowledge of behaviour change practices in ERSs and the conditions, and service activities, that are prudent to advance practice. This research responded to recent recommendations to explore how behaviour change and implementation operate in exercise settings (Czosnek et al., 2020; Stevens et al., 2022).

6.3 Methods

The following research was a mixed methods online survey design. The final survey, from Chapter 5, was converted into an online format which utilised Phonic.ai. Phonic.ai, is an online survey platform that allows the recording of responses using voice notes in addition to Likert scales, and open-ended responses. This enabled the capture of spontaneous, verbalised responses - critical to the think aloud approach - to the practice based vignettes (as discussed in Chapter 5). The survey was launched on July 30th, 2021, and closed October 31st, 2021.

6.3.1 Measures

The online survey included five sections namely 1) an information sheet and consent button (Appendix F) 2) one open ended question examining practitioners' approaches to a behaviour change consultation and one open question asking about the perceived factors which may influence the implementation of behaviour change practices 3) the 25 question realist survey (Appendix G) 4) one randomly allocated practice vignette and 5) a section collecting age, gender, educational attainment, years of ERS experience, and a brief overview of ERS characteristics. Respondents were also asked if they would be willing to be contacted for a follow up interview, for elaboration.

Before the first question, an introduction was provided, outlining the conceptualisation of behaviour change practice in lay terms (Appendix H). Prior to the realist survey an introductory section explained the expectations of the participants, the research aims, and the definitions of capability and motivation as per the COM-B, as these constructs were the explanatory apparatus in the programme theory.

The practice based vignettes (Chapter 5) were preceded by instructions on how to think aloud in the context of the scenario that was presented to them (Appendix D). Cues were issued to encourage respondents to articulate cognitions, mitigate social desirability, and guide their response to include interaction/counselling style, strategies they would employ, and areas they perceived as important (Figure 5.6).

All questions were mandatory and could not be skipped. Each question (except the Likert responses) could be answered through written textboxes, or audio recorded voice notes. During recruitment, participants could choose to fill in the survey independently or organise a time for the survey to be completed, with me facilitating their participation.

6.3.2 Sampling and Recruitment

Recruitment was multifaceted and involved disseminating the survey link to personal contacts, appropriate gatekeepers, and through social media channels (LinkedIn, Twitter, and Facebook). Academics, training providers, local authority employees, and service providers were all utilised to disseminate the survey link to increase the reach of data collection.

Participants were required to have experience of ERSs within the UK. As discussed previously (Chapter 1), ERSs are diverse, and the conceptualisation adopted here aligned with the definitions outlined in national guidance (DOH, 2001). Practitioners required experience of a scheme that had a referral of a moderate risk, inactive individual, with a LTC, from a medical professional, for a time limited PA programme (Eynon et al., 2019). There were no other criteria for inclusion or exclusion and Table 6.1 illustrates the characteristics of the practitioners who took part in this research.

Realist evaluation usually adopts sampling procedures based on theory. For example, using programme theory to select positive and deviant cases where theory can be falsified in varying settings (Emmel, 2013). Conversely, survey research usually relies on random sampling, in which all those who have experience of ERS employment would have an equal chance of being recruited (Emmel, 2013; Etikan & Bala, 2017). Random sampling creates a tension with realist assumptions as static variables are unable to capture the dynamic and infinite features of cases (Emmel, 2013). Yet, survey research does offer the opportunity to provide a group level summary of demi-regularities and their association with implementation from diverse settings, alongside

refining explanatory ideas, strengthening inferences about a wider population (Ravn, 2019; Schoonenboom, 2017). The conceptualisation of ERS and the generation of programme theory (Chapter 4), along with checking the respondents access to important resources and conditions, provided a sampling frame to erect boundaries to the research by describing salient characteristics of the sample (Emmel, 2013). The resultant sampling may be more indicative of convenience sampling whereby once those within the sampling frame, in this case ERSs practitioners, became aware of the research they chose to self-select or not.

6.3.3 Ethics

Ethical clearance was amended due to COVID-19, and an ethics amendment and data collection extension was granted by the ethics panel at St Mary's University. Several features specific to the modified research design required attention. Phonic.ai is a third party platform which captured, collated, and stored data for this research phase. Participants were made aware of the third party involvement in the information sheet. The Phonic.ai privacy policy states that no data is sold for commercial use. This wording was included in the information sheet, and participants were signposted to the full Phonic.ai privacy policy. This aimed to increase the transparency about the security and privacy of respondent's data. In addition, threats to anonymity, confidentiality, and accuracy required planning beyond traditional modes of data collection (Allen & Roberts, 2010). Verification about data management, storage, and privacy were confirmed through conversations with the Phonic.ai team. Testimonials were also sought from other researchers who had used the platform, to mitigate concerns about the platform's data governance protocols and accuracy.

6.3.4 Procedures

The online survey was designed so each respondent would be presented with one random vignette. Furthermore, the order of realist statements was also randomly allocated to decrease a survey order effect (Yonnie Chyung et al., 2018). Where partial survey completions occurred, and email addresses and consent to be contacted were provided, a follow up email was sent. Emails were also sent to those who engaged with the link, my profile, through social media channels but did not complete the survey. The email invited the participants to complete the survey or arrange a facilitated interview. If contact could not be made, one reminder email was sent before

ceasing follow up. Where survey completion was facilitated through an interview, a time and location (or online or virtual) were agreed upon. Survey completion was facilitated in a by semi structured interview where the questions were read out and an informal conversation was audio recorded and transcribed verbatim using Otter.ai.

6.3.5 Analysis

Phonic.ai recorded ordinal responses, written responses, and transcribed voice notes. The data was downloaded as an Excel file and was crosschecked with the original voice notes and text responses for accuracy. Transcripts from the facilitated interviews were read, and the text for each question was inputted to the relevant Excel cell for each survey item.

The vignette transcripts were uploaded to NVivo 12 and each vignette was listened to, and re-read, while scoring the think aloud response across the 11 items of the BECCI (Lane et al., 2005). As discussed in the Chapter 5, the BECCI is a validated competency checklist for an augmented version of MI which has been used in ERS settings (Beck et al., 2016; Lane et al., 2005). Each item received a score of 0, not at all; 1, minimally; 2, to some extent; 3, a good deal; or 4, to a great extent. It became obvious that the think aloud platform was not conducive to demonstrate the use of item 7- 'summaries to bring together what the patient says about the topic'. All respondents scored 0 for this item, suggesting that this was a function of the vignettes and not indicative of actual practice. Therefore, item 7 was deemed not applicable and a mean substitution approach was taken as suggested by the authors of the BECCI (Lane et al., 2005). The mean of the remaining 10 applicable items was taken and used as the score for item 7 in calculating the mean score for each respondent.

Each vignette had unique psychosocial barriers embedded within them which corresponded to appropriate BCTs (Chapter 5). In other words, each behaviour change strategy had 'mechanism of action' selected from the theory and technique tool underpinned by the BCTTv1 and the COM-B (Carey et al., 2018). Once the think aloud responses had been issued a BECCI score, they were read again. The list, and definitions, of appropriate BCTs was used as a coding frame in NVivo 12 to capture the behaviour change strategies employed for each respondent (Appendix I).

Descriptive statistics allowed a quantification of agreement/disagreement with realist statements, alongside summarising the participants exposure to theorised important

resources and contexts (Bonell et al., 2022; Ravn, 2019; Schoonenboom, 2017). Ordinal responses, related to the level of agreement/disagreement with realist statements, were uploaded to IBM SPSS Statistics 28. Demographics, BECCI score, BCT score, completion format, think aloud word count, and the vignette completed were also inputted into this dataset. The survey items, which asked about people's access to conditions and resources purported to support implementation (Chapter 4), were condensed into binary variables to group those working in supportive and non-supportive environments.

The use of two way MANOVAs were planned to examine if there was a difference in implementation scores (BECCI and BCTTv1) between those with access to key resources *and* conditions, as outlined in programme theory, and those without. Nevertheless, due to small sample size, it was not possible as some configurations in the two way MANOVAs only had one participant, making the test irrelevant. A series of one way MANOVAs were conducted to compare if there were differences in implementation scores based on the exposure to key mechanisms *or* conditions pertaining to questions 7, 12, 14, 15, 21, and 27 (Figure 6.1)

Q7. I work in s a service where I have a framework for my behaviour change practice (e.g., manuals, procedures)

Q12. I work in an environment where there is a commitment to support long term behaviour change.

Q14. I work with a group of medical professionals within exercise referral who believe in the shared goal of behaviour change.

Q15. I have partnerships (e.g., calls, meetings, joint learning) with medical professionals who refer to me.

Q21. I have a supportive manager (e.g., role model, allocation of time) that focuses on using behaviour change practices.

Q27. I have on-going support (e.g., training, mentoring) to help my behaviour change practices.

Figure 6.1 Survey questions which pertain to the exposure to key resources and conditions as outlined in programme theory

Post hoc testing was not needed as the independent variables were collapsed into binary groups. Although textbook guidance suggests analysis of variance testing

should use truly random samples, convenient samples can yield credible information, especially when recruiting a sample with specific characteristics (Jager et al., 2017). The use of MANOVAs was useful to examine if patterns of outcomes altered dependant on the strength of the mechanism or context.

Indicative data for each realist survey question, residing in the Excel file, were initially sorted in two ways. Firstly, qualitative responses were examined to see if data referred to the corresponding realist statement as intended and had sufficient information to contribute to theory testing. All responses were pasted into individual Excel tabs, representing each question, and given a yes/no label to trim data that was relevant. Qualitative statements which simply confirmed or denied the statement were omitted as they provided no explanatory detail for testing theory, however, the ordinal responses for these participants were captured elsewhere. Qualitative responses were also checked against the selected ordinal category, to see if clarifications corresponded to the choice on the Likert scale. Secondly, qualitative responses were sorted based on their level of agreement or disagreement with realist statements (Schoonenboom, 2017).

Each Excel tab was then imported into separate NVivo 12 files as a table. The autocode feature was used to split cases based on the yes/no status, allowing the selection of data that was relevant and had sufficient information to code. The autocode feature also separated data into the levels of agreement and disagreement with the realist statements, allowing a separation of data which could validate or refute programme theory. An open question for each programme theory asked about the importance of purported resources (initial part of a realist mechanism) (Dalkin et al., 2015). This was issued prior to testing the mechanisms within each resource. These inductive questions were also analysed to validate or mine alternative factors from the respondent's data.

For the qualitative analysis, the open question regarding the importance of each resource was analysed first. Qualitative explanations for those who agreed or disagreed about the importance of each purported resource were analysed separately. Line by line analysis of each respondent's explanation was undertaken, using an inductive and deductive approach. As the COM-B was the middle range explanatory framework adopted in this thesis, the TDF labels (Cane et al., 2012; Michie et al.,

2011) (Figure 6.2) were used in situations that corresponded well to the established definition e.g. ‘it definitely helps your practice of behaviour change because of that confidence and reassurance’ was coded as ‘beliefs about capability’. Open coding was used where explanations were less obvious, or discussed with a contextual factor (contingencies) in unison e.g. ‘the framework is really important because it shows us what we have to do and gives us guidelines and gives us confidence, but also it is important that this is followed up, but even if it was there then it wasn't followed up, it might not be as successful’ was coded as ‘guidance only when monitored’. The process was undertaken for each subsequent realist statement. A constant comparison approach was used as a tool to cross check open coding and generate condensed themes (Bonell et al., 2022).

Motivation	Capability	Opportunity
Knowledge	An awareness of the existence of something.	
Skills	An ability or proficiency acquired through practice.	
Social/professional role and identity	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting.	
Beliefs about capabilities	Acceptance of the truth, reality or validity about an ability, talent or facility that a person can put to constructive use.	
Optimism	The confidence that things will happen for the best, or that desired goals will be attained.	
Beliefs about consequences	Acceptance of the truth, reality or validity about outcomes of a behaviour in a given situation.	
Reinforcement	Increasing the probability of a response by arranging a dependent relationship or contingency, between the response and a given stimulus.	
Intentions	A conscious decision to perform a behaviour or a resolve to act in a certain way.	
Goals	Mental representation of outcomes or end states that an individual wants to achieve.	
Memory, attention and decision processes	The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives.	
Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence and adaptive behaviour.	
Social influences	Those interpersonal processes that can cause an individual to change their thoughts, feelings or behaviours.	
Emotion	A complex reaction pattern, involving experiential, behavioural and physiological elements, by which the individual attempts to deal with a personally significant matter or event.	
Behavioural regulation	Anything aimed at managing or changing objectively observed or measured actions.	

Figure 6.2. The deductive coding labels, as defined by the COM-B

6.4 Results

The results section is presented in the following order to maximise clarity and connection between the various sections of data. An overview of the data and

descriptive information of the group are provided first. The relationships between having key resources and conditions, as outlined in programme theory, on the likelihood of scoring higher on the behaviour change competencies checklists is then outlined through the MANOVA findings. The results are then organised into the specific theory areas, providing a summary of the level of agreement/disagreement with each aspect of programme theory and the qualitative data to validate, refute, or refine CMOs.

6.4.1 Descriptive Overview of the Data

One hundred and eighteen people started the survey and provided consent. Two of these were inappropriate, as the respondents were not ERS practitioners. Eighty-five respondents quit the survey before meaningful contribution was provided. Thirty two relevant surveys were completed. Two of these responses were incomplete, as respondents managed to overcome the mandatory questioning by using the back button. This meant that as progress through the survey was randomly assigned some questions were not completed by these individuals. Seventeen of the 32 appropriate surveys were completed through a semi structured qualitative interview, and 15 were undertaken independently through the online platform. The demographics of the group are presented in Table 6.1. Of the key factors purported in programme theory 84% said they worked in an organisation that was committed to behaviour change practice. 61% indicated they have behaviour change frameworks for their practice. 50% said they had partnerships with medical professionals. 67% suggested that in their work the medical professional value the role of behaviour change. 87% confirmed they had supportive leadership and 72% said they had on-going support.

Table 6.1. Demographics of the respondents who completed the survey

Characteristic	n=30
Age	38.8 ± 11.2 years
Sex	66.6% Female
Years of ERS experience	9.1 ± 6.4 years
<i>Educational attainment:</i>	
Masters	24.1%
Post Graduate Certificate	10.3%
Degree	41.4%
Level 4	13.8%
Level 3	10.3%
<i>Region:</i>	
Northwest	41.4%
Southeast	20.7%
Wales	13.8%
Southwest	17.2%
Midlands	3.4%
East	3.4%

6.4.2 Quantitative Analysis of Implementation Scores

The assumptions of the MANOVAs were examined using Pearson correlation, Shapiro Wilks, Mahalanobis distance, scatterplot matrix and Box's M (Appendix J). Although three of the six MANOVAs had unequal samples sizes, all assumptions were satisfied except multivariable normality in three instances. Nonetheless, approximate normality is acceptable in MANOVAs, as evidence suggests they are robust to violations to normality (Knief & Forstmeier, 2021).

Behaviour change practice was conceptualised in this thesis as both the level of person centred behaviour counselling (BECCI) and appropriate BCTs, therefore the initial analysis was interested in the relationship between elements of programme

theory and the combined scoring of these two variables. Behaviour change frameworks ($F=3.598$, $p<0.05$) and partnerships with medical professionals ($F=0.628$, $p<0.05$) were the only models to reach statistical significance, interpreted through Wilks Lambda.

Detailed analysis of each individual measure of behaviour change practice are described forthwith. Table 6.2 provides the descriptive and statistical results, examining if there was a significant difference between BECCI outcomes, depending on exposure to the resources deemed important within the programme theory. Having access to behaviour change frameworks/practice guidance was associated with a statistically significant difference in BECCI score ($F= 5.807$, $p<0.05$). On-going support of practice demonstrated a statistically significant difference in BECCI score ($F= 4.765$, $p<0.05$), when analysed separately. Although, statistical significance was not reached for supportive leadership and partnerships with medical professionals, the data trended towards an increased BECCI score for those with access to these resources ($p=0.05$ and $p=0.08$ respectively).

Table 6.2. Associations between exposure to mechanisms and BECCI score

Resources	Present	Absent	95% CI of the difference
Behaviour change frameworks	1.9 ± 0.7	1.2 ± 0.6	0.093-1.177*
Medical partnerships	1.9 ± 0.6	1.4 ± 0.8	-0.767-1.031
Supportive leadership	1.7 ± 0.7	1 ± 0.5	-0.002-1.549
On-going support	1.8 ± 0.7	1.1 ± 0.5	0.038-1.352*

* Denotes statistical significance ($p<0.05$) (mean ± SD)

Table 6.3 outlines the descriptive and statistical results relating to the relationship between the volume of appropriate BCTs implemented in the vignettes and access to resources from programme theory. There was a statistically significant increase in the number of appropriate BCTs used when respondents had partnerships with medical professionals, defined by calls, meetings, and joint learning ($F=7.382$, $p<0.05$). The presence of supportive leadership indicated a greater utilisation of appropriate BCTs (5.9 vs 3.5); however, statistical significance was not reached ($p=0.08$). Lastly, the

provision of ongoing support, in the form of training and mentoring, was associated with a statistically significant difference in the use of appropriate BCTs ($F=4.39$, $p<0.05$), when analysed separately.

Table 6.3. Associations between exposure to mechanisms and BCTTv1 score

Resources	Present	Absent	95% CI of the difference
Behaviour change frameworks	6 ± 2.4	5 ± 2.5	-0.940-3.000
Medical partnerships	6.8 ± 2.2	4.5 ± 2.3	0.561-4.045 *
Supportive leadership	5.9 ± 2.5	3.5 ± 1	-0.270-5.020
On-going support	6.3 ± 2.5	4 ± 1.1	0.034-4.467*

* Denotes statistical significance ($p<0.05$) (mean ± SD)

The presence of two contextual factors, which were purported by programme theory to facilitate the influence of resources, were not associated with differences in implementation scores. Having partnerships that explicitly focus on behaviour change was not associated with statistical differences in implementation scores (BECCI= 1.7 ± 0.7 vs 1.5 ± 0.8 ; BCTTv1= 5.8 ± 2.7 vs 5 ± 0.19). Likewise, being part of an organisational environment that is committed to long term behaviour change did not show demonstrable differences in implementation scores (BECCI= 1.7 ± 0.6 vs 1.2 ± 1.1 ; BCTTv1= 5.8 ± 2.4 vs 4.4 ± 2.7). Most respondents agreed that personal motivation would support implementation irrespective of support (>90% for each theory area). Yet, performance varied across the group, showing that motivation alone is not indicative of implementation.

6.4.3 Theory Area 1: Behaviour Change Frameworks

The statistical testing indicated that some of the resources proposed in programme theory are associated with increased BECCI and BCTTv1 scores. The resources seemed to influence the implementation of person centred counselling and BCTs differently. Nonetheless, the relationships between aspects of programme theory and implementation scores does not validate or refute the explanatory ideas within programme theory which needed examining.

Expectations from programme theory were compared with the proportion of respondents who either agreed- by combining responses that answered 'somewhat' and 'completely'- or contradicted- by combining responses that answered 'not really' and 'not at all'- the proposed ideas. Table 6.4 summarises the level of agreement and disagreement with realist statements compared with expectations from the programme theory related to behaviour change frameworks. There was 96.8% agreement that behaviour change frameworks would increase the likelihood of implementation. Contrary to the proposed programme theory, 55% disagreed that 'behaviour change frameworks must improve my motivation (e.g. beliefs, habits, emotions, intentions, identity) if it is to influence my behaviour change'. Following on from this 71% of the cohort agreed that a separate mechanism would trigger changes to implementation. Nevertheless, 71% did agree that 'a behaviour change framework will help my practice only when the environment (e.g. organisation expectations, staff commitment) is focused on behaviour change'. Although committed staff was proposed as a vital context to facilitate frameworks supporting practice, 97% of respondents suggested that practitioner motivation would lead to implementation 'even if a behaviour change framework is absent'.

Clarifications on the level of agreement/disagreement for each realist statement were analysed if they were relevant to the question and had sufficient data. This meant there was a variable level of qualitative data for each question. Of the 20 clarifications with qualitative text relevant to the survey questions about behaviour change frameworks, seven agreed with the role of motivation, as defined in the TDF and COM-B, as the mechanism (Figure 6.3).

There were 13 useable statements that refuted the role of motivation as the mechanism within behaviour change frameworks. Data suggested that frameworks provide 'guidance', 'reference points', and 'prompts' that have an impact on implementation. Although some respondents disagreed that behaviour change frameworks affect motivation, the analysis of qualitative data showed they corroborated the role of motivation. Contrary to the ordinal response, respondents outlined how frameworks positively influence motivation through changes to beliefs about capability, professional identity, and beliefs about consequences e.g., 'confidence', 'less overwhelming', 'feeling organised and clear about my practice'.

Table 6.4: Testing the level of agreement/disagreement with realist statements related to behaviour change frameworks

Behaviour change frameworks...	Disagreement		Agreement		Total (expectation)
	Not really	Not at all	Somewhat	Completely	
...increase the likelihood of implementation	3.2%	0%	38.7%	58.1%	97% (100%)
...must alter motivation to influence implementation	48.4%	6.5%	19.4%	25.8%	45% (100%)
...change something else triggering implementation	19.4%	9.7%	45.2%	25.8%	71% (0%)
... are not needed if I am personally motivated	3.2%	0%	19.4%	77.4%	97% (0%)
... will only help when the environment is focused on long term behaviour change	25.8%	3.2%	38.7%	32.3%	71% (100%)

This shows that the term motivation, as defined in this thesis, was misinterpreted by some respondents. However, an alternative mechanism was also noted. Changes to capability through procedural knowledge and decision making were outlined as a benefit gained from having a framework e.g. 'logical steps', 'consistency', 'refresher', 'reference point', 'increased toolkit'.

The activation of motivation or capability mechanisms was described by respondents to be contingent on two separate contexts. Frameworks enhanced motivation if behaviour change practices were monitored and appraised. Frameworks seemed to be more linked to capability where attendees are 'awkward', and practitioners find engaging them challenging. The role of these separate conditions was consistent, highlighting how behaviour change frameworks influence varying mechanisms, contingent on contextual factors (Figure 6.3).

As stated above most respondents agreed that personal motivation underscores behaviour change practice regardless of the existence of a framework. Nevertheless, it was suggested that a framework would make it 'easier'. Personal motivation was driven by the passion for the job and perceived value about the efficacy of practices as outlined by two respondents 'I kind of have a passion for helping people improve...you actually see first-hand multiple outcomes; I mean I do love what I do' and 'if something works it motivates me'. It was noted that practitioners who were less experienced, and not passionate about helping people, would respond differently to behaviour change frameworks. This meant that despite trying to elucidate the essential context where behaviour change frameworks influence implementation, conditions could not be separated from personal goals.

Twelve out of 13 usable clarifications agreed that an organisational focus on behaviour change is needed if frameworks are to support practice. Respondents explained that the organisational commitment to behaviour change practice enhances local conditions, which allow frameworks to enhance practice including 'time', eased numerical 'pressure', 'recognition', and collaborative 'learning'. One response highlighted that the guidance would still inform practice, irrespective of the organisational commitment, but provided no data explaining why.

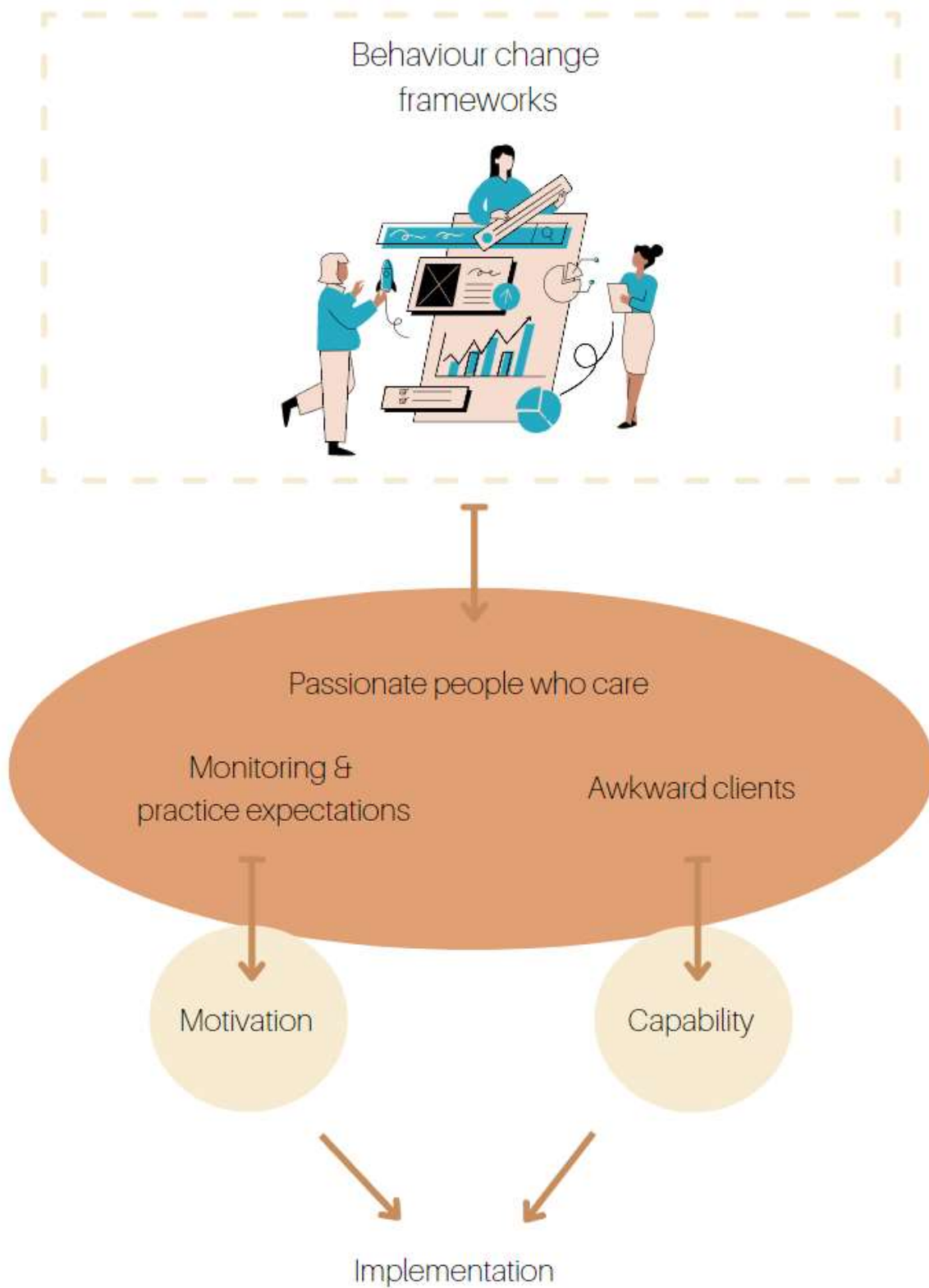


Figure 6.3. A refined realist theory of how behaviour change frameworks influence the implementation of behaviour change practices

6.4.4 Theory Area 2: Partnerships with Medical Professionals

Table 6.5 illustrates the applicability of the partnership with medical professional programme theory. 83% of the survey responses agreed that partnerships with medical professionals would improve the likelihood of implementation. 80% of the responses agreed that ‘partnerships must improve my motivation (e.g. beliefs, habits, emotions, intentions, identity) if they are to influence my behaviour change practice’. Conversely, 43% also suggested that other mechanisms play a role in implementation outcomes due to partnerships. Although 33% thought that partnerships would support implementation irrespective of the medical professional’s commitment to behaviour change, 67% agreed that ‘partnerships are irrelevant to my behaviour change practice unless there is a shared effort that values behaviour change’.

Table 6.5. Testing the level of agreement/disagreement with realist statements related to partnerships with medical professionals

Partnerships with medical professionals	Disagreement				Agreement		Total (expectation)
	Not really	Not at all	Somewhat	Completely			
... increase the likelihood of implementation	10%	6.7%	16.7%	66.7%			83% (100%)
... must alter motivation to influence implementation	16.7%	3.3%	53.3%	26.7%			80% (100%)
...change something else triggering implementation	20%	36.7%	36.7%	6.7%			43% (0%)
...will help only when there is a shared effort that values long term behaviour change	30%	3.3%	36.7%	30%			67% (100%)

Twenty out of the 23 usable explanations agreed that partnerships with medical professionals are important for implementation. Both the inductive data from the open question about the importance of partnerships, and the clarifications from realist statements, confirmed the role of group identity, collaborative working, and beliefs

about professional roles, which all fall within the motivation label of the COM-B (Carey et al., 2018). There was also an emergent emotional element of motivation which was not established in the theory building data. Communication, where medical professionals are 'on your side' was seen to decrease 'fear' and provide 'reassurance' about practice. Partnerships were also interpreted as involving group learning and shifting the culture of practice by 'asking questions', 'sharing experiences', and adopting the 'same language about practice'.

An unexpected relationship within partnerships was noted. It was proposed that increased continuity, when medical professionals value the service, would enhance implementation as patients would arrive more informed, ready to change, and perceiving the service in a credible way (Figure 6.4). Partnerships with the medical professionals would make implementation 'easier' as the attendee would be more primed for change as outlined by one response, 'It helps with the motivations of the individuals as well because if you've got a health professional, encouraging, change, then, that message is going to come through a little bit more strong'.

Where people disagreed with the importance of partnerships with medical professionals, it was due to the difficulty envisaging this. One respondent could not imagine a conversation about behaviour change with a GP. Six statements countered the proposed role of motivation resulting from partnerships. Although, six people disagreed with the realist statement, group identity and a shared learning environment, as per the COM-B, were outlined in these respondents' explanations with examples including 'feelings of professionalism and collaboration which impacts on my confidence', and 'mutual understanding and mutual relationship'. This shows a different interpretation of motivation, as it has been defined, in this thesis.

There was an alternative mechanism suggested, proposing that the communications with medical professionals would improve implementation as it would help remind practitioners to practice behaviour change approaches, or capability as defined within the COM-B. It was suggested that 'more fruitful' conversations and reinforcing partnerships would make implementation easier. However, where staff are committed to helping people, they will seek to implement these practices in the absence of partnerships. One respondent disagreed and suggested that pre-existing skills are an important adjunct to this theory, however, the response was lacking in detail.

Thirteen out of the 20 useable statements agreed that partnerships are irrelevant unless there was a shared agenda for long term behaviour change. Having referrers 'on your side' was deemed to be important. A GP that values ERSs was said to increase credibility with attendees and integration may improve. It was suggested that ERSs do not have this collaborative integration and 'GPs think they know best', practitioners are isolated, and the referral process is inappropriate. This is thought by the practitioners to create subpar patient preparation, information sharing, and unsuitable referrals. This was seen to impinge on communication with the medical professionals, therefore hampering implementation. Seven respondents disagreed that partnerships were irrelevant unless there was a shared effort. Many of the clarifications highlighted that being able to obtain general information would support their implementation, even if the referrers did not share the same values, as it would increase their efficiency. The communication and sharing of diverse information would decrease emotional input and streamline practice, irrespective of the GP's commitment to long term behaviour change.

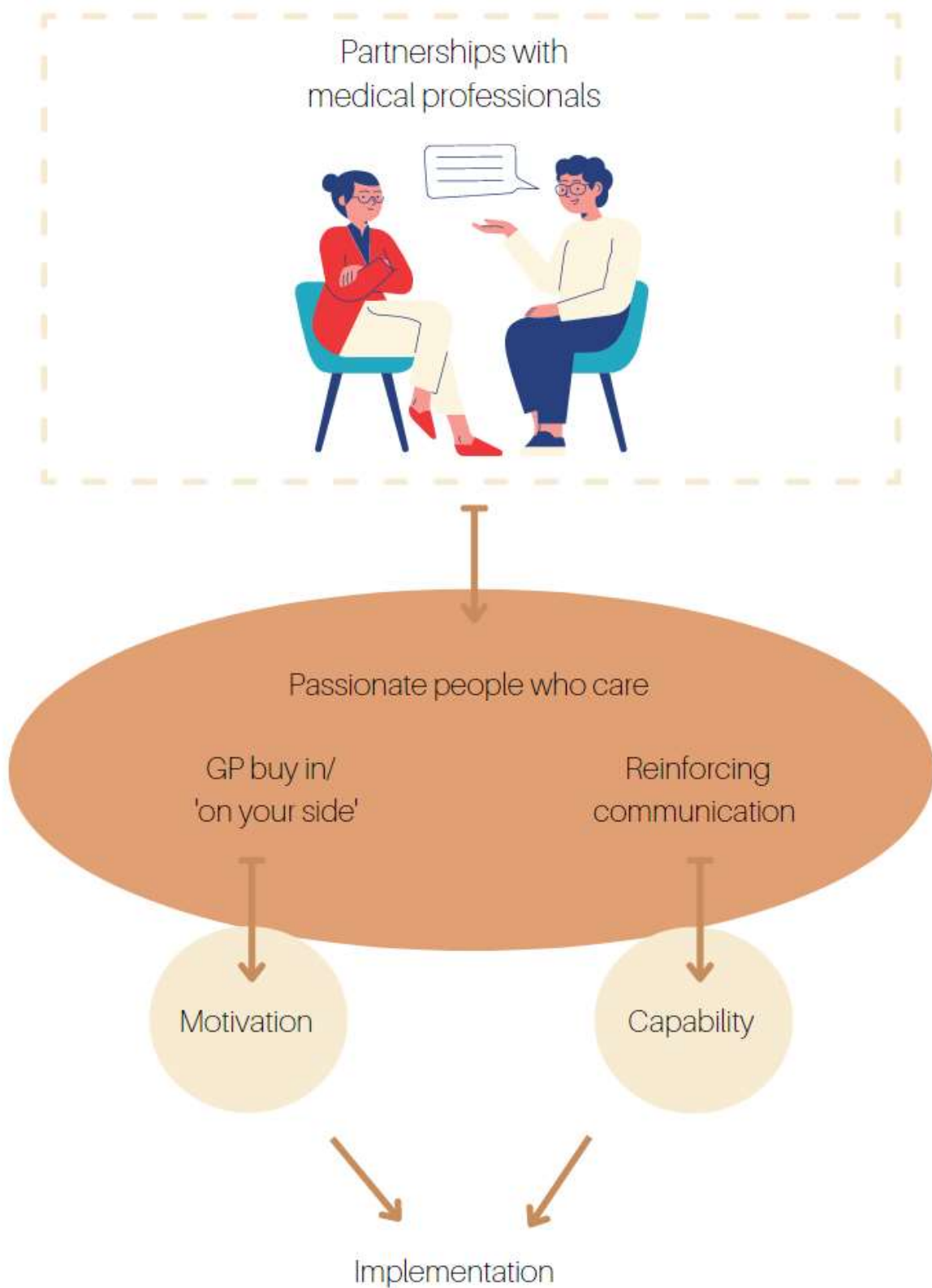


Figure 6.4. A refined realist theory of how partnerships with medical professionals influence the implementation of behaviour change practices

6.4.5 Theory Area 3: Supportive Leadership

Table 6.6 provides an overview of the leadership theory and the applicability of realist statements. 97% of the responses agreed that supportive leadership would positively influence implementation. 87% of the group corroborated that ‘supportive management must improve my motivation (e.g. beliefs, habits, emotions, intentions, identity) if it is to influence my behaviour change practice’. 48% also suggested that ‘supportive management improves something other than my motivation triggering me to use behaviour change practices’. 73% agreed that the work environment must prioritise long term behaviour change if supportive leadership is to augment implementation outcomes. A consistent finding was that motivated practitioners felt they would attempt to implement behaviour change practices irrespective of their working environment as 94% agreed that ‘if I am motivated, I will use behaviour change practices even if supportive management is absent’.

Table 6.6. Testing the level of agreement/disagreement with realist statements related to supportive leadership

Supportive leadership	Disagreement		Agreement		Total (expectation)
	Not really	Not at all	Somewhat	Completely	
...increases the likelihood of implementation	3.2%	0%	19.4%	77.4%	97% (100%)
... must alter motivation to influence implementation	9.7%	3.2%	45.2%	41.9%	87% (100%)
... changes something else triggering implementation	19.4%	32.3%	32.3%	16.1%	48% (100%)
... is not needed if I am personally motivated	6.5%	0%	22.6%	71%	95% (0%)
... will help only when the environment is focused on long term behaviour change	20%	6.7%	53.3%	20%	73% (100%)

Twenty out of 22 useable statements agreed that supportive leadership must augment motivation to influence implementation. Noteworthy elements of motivation from the COM-B were evident in respondents' clarifications including beliefs about capabilities, intentions, and emotional support. Concrete examples of motivation include respondents discussing that it would be 'nice to have someone who has got your back... it's a bit lonely', 'because of confidence and reassurance', and 'just sort of appreciation you know you work hard, and you want people to recognise what you do is right'. This validates dimensions of motivation from the programme theory.

Additional aspects of motivation were also uncovered. Where role modelling is offered it motivated practitioners due to 'recognition' and 'reinforcing' aspects of motivation. One respondent discussed how seeing his manager work in certain ways was 'intoxicating'. There was also data outlining how a supportive role model leads to a spread of values, where all the team commit and contribute to the agenda. This was facilitated through reflection, team interactions, and the alignment of the service format. Allocation of time by a manager was motivating as it encourages reflection, sets expectations, and increases professional autonomy and job satisfaction as outlined in one example 'for me personally it is motivating because this relates directly to the time, I would be allocated to have these conversations'.

A minority of respondents disagreed that leadership would support implementation. Clarifications outlined that some practitioners felt it is solely their job to be motivated, obtain skills, and utilise these skills to help people. Ten usable statements agreed that leadership would augment a different mechanism. Upon examination respondents outlined aspects like 'assist my understanding about the importance of behaviour change' and 'supportive management would give me pride, encouraging me to want to do better' which corresponds with motivation labels in the COM-B.

However, capability was an alternative mechanism highlighted by some respondents (Figure 6.5). Some practitioners envisaged that a supportive leader enhances knowledge of key practices e.g. 'might get something off them other than motivation like advice and knowledge', 'it's about learning how to run a brief motivational interviewing interview'. This was discussed by some in the context of 'bouncing ideas' and 'putting a plan together with difficult patients'. Respondents proposed that where

the leader was a role model and encourages vicarious learning it triggers a capability mechanism.

Personal characteristics were confirmed as being important, with 29 statements outlining that behaviour change practices would be used irrespective of supportive leadership. Where people are passionate about their role respondents suggested it supersedes the need for supportive leadership. It was acknowledged that other practitioners, with less experience, may change their intentions when management does not encourage a behaviour change focused practice. It was noted that implementation would be more difficult when expectations do not match behaviour change ideals, there is lack of reinforcement, and a low resource allocation for the scheme. Two statements disagreed and highlighted how the supportive management is a necessary resource to inspire commitment, standards of practice, and learning.

Fifteen out of 21 useable statements confirmed the importance of organisational commitment to behaviour change. Respondents suggested that commitment creates conditions which allow the supportive leadership to trigger the mechanisms. When the conditions are aligned to a behaviour change agenda respondents suggested that it provides time, expectations, and tailoring to attendee needs. Without this context, supportive leadership would be 'going against the grain' and dealing with pressures which do not align to the purpose of ERSs. This, it is proposed, would make implementation harder, and the support of leadership muted.

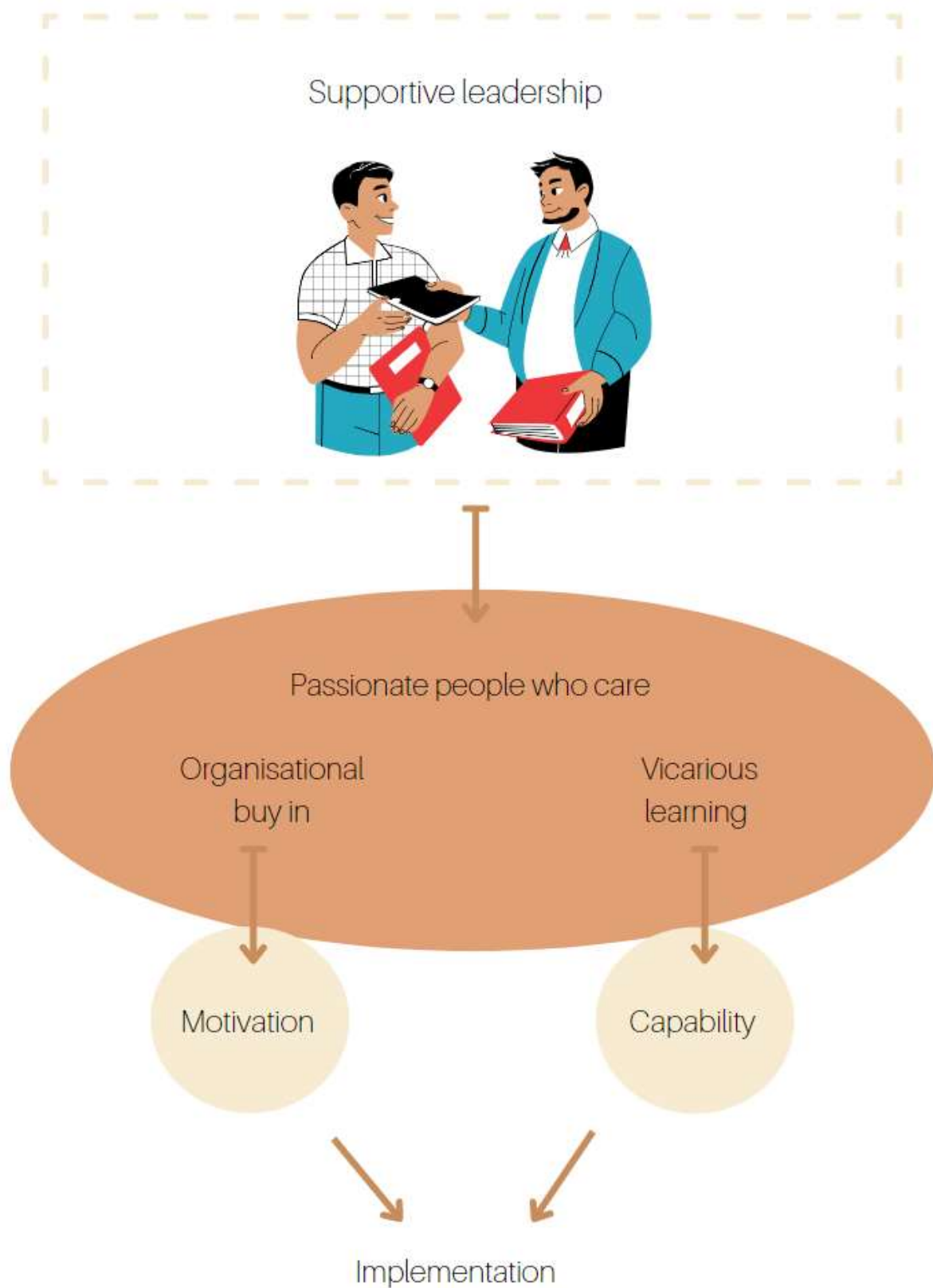


Figure 6.5. A refined realist theory of how supportive leadership influences the implementation of behaviour change practices

6.4.6 Theory Area 4: On-going Support

Table 6.7 provides an overview of the responses related to the programme theory of on-going support. 90% of respondents agreed that ‘if I have on-going support (e.g. training, mentoring) it is likely I will use behaviour change practices’. 86% agreed that ‘on-going support must increase my capability (e.g. skills, knowledge, memory) if it is to influence my behaviour change practice’. Nevertheless, 62% agreed ‘on-going support improves something other than my capability triggering me to use behaviour change practices’. 93% of respondents said that if they were capable already, they would practice without on-going support. 69% of respondents agreed that ‘on-going support will help my practice only when the environment (e.g. organisation expectations, staff commitment) is focused on long term behaviour change practice’.

Table 6.7. Testing the level of agreement/disagreement with realist statements related to on-going support

On-going support	Disagreement	Agreement			Total (expectation)
		Not really	Not at all	Somewhat	
...increases the likelihood of implementation	10.3%	0%	24.1%	65.5%	90% (100%)
... must alter capability to influence implementation	10.3%	3.4%	48.3%	37.9%	86% (100%)
... changes something else triggering implementation	17.2%	20.7%	48.3%	13.8%	62% (100%)
...is not useful if I am already capable	6.9%	0%	27.6%	65.5%	93% (0%)
... will help only when the environment is focused on long term behaviour change	20.7%	10.3%	41.4%	27.6%	69% (100%)

Twenty out of 24 useable statements confirmed the role of capability with regards to ongoing support. Aspects of capability which were unearthed during the theory building research (Chapter 4) were verified including changes to skills, memory, and knowledge. There was also an element of habit formation, as learning about different tools seemed to sensitise practitioners about elements of practice. Subsequent attempts at implementation then provided positive feedback about practice and enhanced changes to routine care as 'unless I see results, sometimes it's difficult to change my habits'.

In addition, respondents proposed that motivation, of various guises, may explain changes to implementation due to ongoing support (Figure 6.6). It was proposed that on-going support increases enthusiasm and beliefs about professional identity e.g. 'made me feel like this is what we are supposed to be doing, this was our core mission'. On-going support also reinforced these practices and led to 'solidified' knowledge as part of a practitioner's role. Increased beliefs about capability were also discussed from an experiential stance and how on-going support can 'give you some confidence that what you are doing is correct'. Lastly, on-going support was seen as motivating as it enhances trust in the organisation and validates the role of these practices in usual care.

Where respondents disagreed with programme theory, they referred to the temporal aspect of training and implementation. Respondents suggested that support was only important to equip the workforce with the knowledge and skills to practice when there are gaps in the competency of practitioners. Alternatively, on-going support was seen as useful to team morale and peer support and was not directly related to a capability improvement.

It was expected that respondents would disagree that existing capability would negate the impact of on-going support. Nonetheless, 16 out of 18 explanations said they would implement behaviour change practice irrespective of ongoing support if they were already capable. Many outlined that having the capability to practice, and building practice over time, led to practices which are valued and engrained. Respondents did however highlight that on-going support would help 'fine tune' and 'energise' practice. Respondents also suggested that this would only be possible where the environment permits it, alluding to the importance of the organisational commitment to behaviour

change which was further confirmed by 18 of the 23 clarification that asked specifically about this question. Respondents discussed that where the service is not conducive to behaviour change practice, it creates pressures which impinge on acting on the support offered. Clarifications outlined that where these pressures exist, it creates a 'friction' and practitioners may end doing 'what they're telling me to do'. The respondents proposed that practice becomes more difficult when services are at capacity and practitioners are not given the time to implement behaviour change practices, leading to burnout and self-preservation. In addition, respondents outlined that where the organisation is not focused on behaviour change, the format of the service will create challenging conditions to utilise on-going support. Service format, including appropriate time for consultations, appropriate salary, and local support, were seen as preconditions which facilitate changes to practitioners due to ongoing support. Conversely, many respondents experienced schemes with incongruent service aims, values, and procedures which hampered the ability to capitalise on ongoing support.

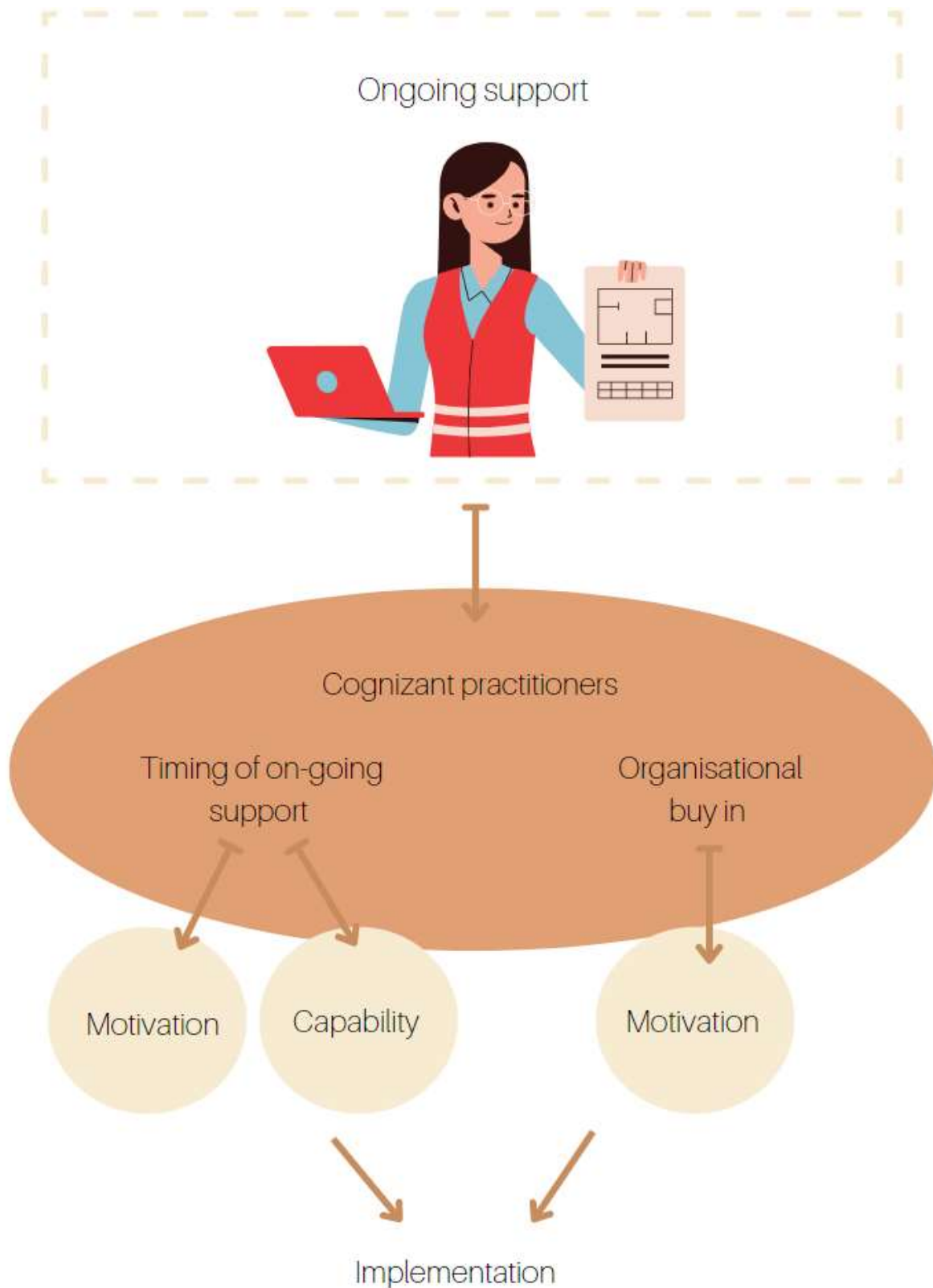


Figure 6.6. A refined realist theory of how on-going support influences the implementation of behaviour change practices

6.5 Discussion

The current research phase tested the programme theory (Chapter 4) which outlined that operating procedures, supportive leadership, and integration with medical professionals contribute to the implementation of behaviour change practices. The process of pretesting and operationalising programme theory for testing (Chapter 5), led to the separation of operating procedures into on-going support and behaviour change frameworks, as these were seen as discrete theories.

Key findings from this phase of the thesis validated the programme theory and some of the theory areas were associated with improved implementation scores. The importance of the resources in programme theory were substantiated by the opinions of the cohort and quantitative testing. The conditions needed, and causal explanations, that influence implementation, as outlined in programme theory, were largely supported. An exception to this was the role of motivation in response to behaviour change frameworks, which was refuted by 55% of the cohort. However, upon examination many respondents who challenged the role of motivation provided explanations which corresponded with the constructs from motivation, as defined in the COM-B (Michie et al., 2011).

Alternative mechanisms, and the conditions where they are triggered, were provided for all four theory areas. Despite the survey, and interview process, trying to isolate the essential context for each theory area, respondents consistently discussed the relevance of personal goals *and* the conditions they work within. The function, and categories, of context in realist research is becoming more established (Greenhalgh & Manzano, 2021; Nielsen et al., 2022; Sheaff et al., 2021). Usually, however, the co-existence of two features of context in a single causal configuration is not used. Conversely, others have argued that the goals of actors are important within the conditions, systems, and networks they reside (see North, 2017).

Chapter 4 provided a brief commentary on how the initial programme theory compared with the current evidence. The following discussion will focus on the novel contributions from this phase of the research. Realist research is limited in ERS research, however, similar programmes from behaviour change and implementation science can be consulted to explore if the causal configurations presented in this data resonate with existing knowledge. Realist implementation research will be consulted

to examine how the mechanisms and conditions suggested in this thesis correspond to existing knowledge.

6.5.1 Behaviour Change Frameworks

The importance of organisational expectations, that value behaviour change as a prudent context, were confirmed during theory testing. Respondents further shaped how this climate interacts with the frameworks supporting implementation. This bolsters the strength of the results in this thesis, as context within realist evaluation can be defined in a passive way, diminishing the value of realist theory (Greenhalgh & Manzano, 2021). Respondents highlighted that a climate that monitors practices is an important condition to trigger changes to motivation. The narrative review in Chapter 2 substantiates the respondent's viewpoint. The narrative review summarised that practice norms and inclusive planning are associated with greater behaviour change implementation (Buckley et al., 2018; Dineen et al., 2022; Raposo et al., 2020). The narrative review, however, did not focus on the role of monitoring in an explicit manner.

Exercise referral guidance outlines the need for monitoring and evaluation of practice. Policy guidance advocates for extensive monitoring beyond just registering attendance. A noteworthy recommendation is the need for the qualitative exploration of implementation (DOH, 2001). The value of monitoring and long-term evaluation may be the on-going learning from practice and accumulation of evidence to demonstrate the worth to funders and stakeholders (Downey & Golder, 2021). Yet, the policy documentation does not outline how organisational commitment to behaviour change, and subsequent monitoring and evaluation, influences implementation.

It is noted elsewhere that when organisational priorities are clear, and processes are employed to create a learning climate, implementation improves (Davies et al., 2019). A rapid realist review, exploring the implementation of shared decision tools, proposed that monitoring in a supportive climate is motivating as it creates a professional identity. A congruent climate, and monitoring practice, shows practitioners what approaches are valued, alongside decreasing competition with other aspects of care (Joseph-Williams et al., 2021). Likewise, a systematic realist review showed that monitoring practice increases urgency, values opportunities for knowledge sharing, and legitimises practice and feedback. This is more pronounced when bottom up

approaches are employed (Hut-Mossel et al., 2021), which corresponds to the qualitative data gleaned in this thesis. Although both studies, which verify the data from this thesis, focus on theory, involve implementation, and adopt a realist logic, inferences must be taken with caution. Hut-Mossel and colleagues (2021) employ a realist logic but deviate from key epistemological assumptions which means lessons must be treated tentatively. The adoption of positivist language is noteworthy, including the systematic search approach and use of quality appraisal tools. Realist literature searching values 'every nugget' of data that can populate theory (Pawson, 2006). Omitting papers due to a prescribed rigour criteria means important contextual data may be missed. There is also evidence of reductionist thinking as theory formulation is inconsistent. It is unclear how context is distinct form, and influences, responses to resources. The main critique of the Joseph-Williams and colleagues (2021) paper centres on the conceptualisation of shared decision aids. Although the practical framework and monitoring of practice are discussed in realist language, shared decision aids conflate the practice of PCC. When successful implementation is viewed as adopting a shared decision aid, it does not consider the use of compassion, respect, dignity and emphasising a person's strengths (Greenhalgh, 2018). Therefore, although frameworks, when used in a supportive environment that monitors practice, seem to motivate practitioners, and improve implementation; practices may not represent PCC as envisaged. Nonetheless, it is indicative, both in the data presented in this thesis and contemporary realist work, that motivation is enhanced when the climate monitors and expects behaviour change practice, as it directs staff to work in a certain manner.

An alternative mechanism, in response to behaviour change frameworks, was identified in the data. Where attendees are challenging to engage, the frameworks increase capability as they provide direction and an extended toolkit to facilitate conversations. The role of frameworks to support implementation and capability is well established (Powell et al., 2015). Nonetheless, implementation failure is common, and understanding how frameworks support practice is not consistent. There is a lack of literature explaining what contextual factors influence implementation resources and their mechanisms of action (Geng et al., 2022).

Practice guidelines can improve knowledge but are not sufficient to develop skills or the adoption of psychosocial approaches (Herschell et al., 2010). Results from this

thesis indicate that when practitioners feel they are in a difficult scenario, they refer to frameworks to equip them with the tools to overcome a perceived challenge. This is not well documented elsewhere and therefore provides novel insights into the contextual factors that trigger responses to practice frameworks in behaviour change implementation.

6.5.2 Partnerships with Medical Professionals

The importance of partnerships with GPs, or medical professionals, was verified in the results. As expected, communication and learning were a core part of supportive partnerships. There were tangible examples in the data where a shared philosophy between professional groups enhanced communication and motivation as practitioners felt part of the team and that GPs valued their skills and input. This is proposed to cement practitioner's beliefs about their role and increase positive emotions. Partnerships with a common values systems is an essential part of change management and implementation, as it fosters investment, coherence, and a common agenda (Fortin & Stewart, 2021; Joseph-Williams et al., 2021). A lack of shared agenda can challenge effective partnership working, and communication, if one party is undervalued or covert motives exist, as outlined in two recent realist reviews (Aunger et al., 2021; Calderón-Larrañaga et al., 2021).

Interestingly, the label 'trust' was not used routinely in the current data by respondents, despite being a well-established mechanism prudent to partnership working (Aunger et al., 2021). This may be due to the focus on implementation behaviour and not the integration of the professional groups in general. Respondents did discuss the need for GPs to have faith in ERSs if partnerships are to enhance implementation, which is discussed elsewhere in the literature (Aunger et al., 2021). The hesitancy shown within the current data presented above regarding the GP's commitment to PCC may be valid. It has been shown that several characteristics in medical professionals' hamper learning about PCC. Where medical professionals are not clear about their role in PCC, prioritise a biomedical form of science, and are unable to envisage implementing practices that value lived experience, PCC education interventions fail (Bansal et al., 2022). Conversely, and in line with the respondents' data, where practitioners have the opportunity to communicate and engage in shared learning, it increases a sense

of belonging, stimulates compelling and memorable reflections, and supports self-validation (Bansal et al., 2022; Davies et al., 2019).

Practitioners felt that well-functioning partnerships, with mutual respect, would also influence their decision making through reminding them about practices. This was prudent when communication with these professionals was reinforcing the shared agenda. This is confirmed in other realist research, examining the implementation of shared decision making (Joseph-Williams et al., 2021). Another novel insight gleaned from the current research was the role of GP's commitment to behaviour change on attendee preparedness. If GPs explicitly encourage the service, and outline the purpose and intent of the service, it provides credibility and primes the attendees for the service, making implementation by ERS practitioners easier. This is supported elsewhere which notes the importance of GP's providing a clear commitment to PCC, which influence's attendee characteristics (Joseph-Williams et al., 2021).

6.5.3 Supportive Leadership

The influence of supportive leadership in implementation endeavours is well known but the processes by which they exert influence are underdeveloped (Birken et al., 2018; Birken, 2019). Supportive leadership will influence motivation through the allocation of resources, setting expectations, role modelling, and providing a vision for practice (Chapter 4). The role of leadership to support capability was a novel insight highlighted during theory testing. Supportive leadership will improve capability when there is a setting that provides the space for vicarious learning. Examining other realist research provides cross cutting themes that respondents discussed. Learning that is experiential, evolves over time, privileges group learning and reflection, and occurs in a non-judgmental space helps transform attitudes and enhances learning (Bansal et al., 2022; Davies et al., 2018). Respondents positioned supportive leaders as role models who are a catalyst for improving practice. Supportive leadership, which includes role modelling and shaping the local culture to privilege learning, was suggested as paramount in this thesis. It has also been shown that leaders actions are more potent for implementation success than their attitudes (Farahnak et al., 2020), cementing the importance of role modelling as outlined by the respondents in the current data. Others have confirmed the importance of local leaders to be sensitive to local barriers and drive the practice culture (Bianchi et al., 2018). Leadership that

emphasises a shared vision is fundamental to practice culture. Realist work suggests it can enhance implementation through increased commitment and accountability (Davies et al., 2019), which was evident in the qualitative explanations from respondents.

6.5.4 On-going Support

The role of on-going support to influence capacity was confirmed and training is a consistent feature in the implementation literature (Grover et al., 2021). A novel addition to this theory area was the role of the timing of on-going support. It was suggested that capability is important when staff are inexperienced. When the scheme is well established a separate mechanism is triggered. Periodic on-going support, in settings where practice is already valued, motivates practitioners as it enhances their professional identity, reinforces their values, strengthens morale, and increases beliefs about capabilities. These aspects of motivation, as an alternative mechanism, are also seen in other realist research (Joseph-Williams et al., 2021). However, the temporal role of training is not mentioned by the authors, or the wider literature. There is however a realist review that examined how self-management training influences health care professionals. The paper provides support for how on-going support evolves over time, triggering separate mechanisms. The work was framed through a transformative learning lens. The authors illustrated how training improves knowledge and skills, but also alluded to how learning evolving over time and that a paradigm shift within practitioners occurred as personal and professional beliefs change. This subsequently increases commitment, collective vision, and motivation (Davies et al., 2018).

A recent realist review examined how social prescribing, which employs a similar model to ERSs, can be implemented successfully. The authors proposed that training is needed to increase capability. The authors also referenced the importance of on-going opportunities for supervision, peer support, and a climate for collaborative learning (Calderón-Larrañaga et al., 2021). This corresponds to the qualitative data provided by respondents in the current research. Although Calderón-Larrañaga et al. (2021) do not propose separate mechanisms in their work, there is a distinction between how on-going support provides knowledge, and its role in influencing the collective motivation to practice in a certain manner. Sinclair and colleagues (2021)

also propose diverse mechanisms by which training enhances changes to compassionate care. Although, they fail to arrange their theory at a middle range level or make connections between contexts and changes to reasoning. Nonetheless, aspects of capability and motivation are both noted, verifying the existence of the dual mechanisms as proposed by the respondents in this thesis.

The conditions which trigger the activation of each mechanism, however, is not alluded to in the current evidence base. This is not surprising given the tendency to conflate implementation to a range of strategies to change practitioner behaviours (Patey et al., 2021) without considering how contextual factors change the appropriateness of tools. Respondents suggested that pre-existing capabilities would equip them to implement behaviour change practices, regardless of on-going support. It was envisaged that baseline awareness of practices would be an important condition to facilitate changes to capability. The role of individual characteristics and responses to training is detailed elsewhere. The importance of practitioners who already feel proficient and committed to practice is highlighted in other realist work (Sinclair et al., 2021). Conversely, those who do not view their practice in a congruent manner are resistant to training (Bansal et al., 2022; Sinclair et al., 2021).

The importance of a committed organisation was verified by respondents. Interestingly, it has been shown that the initiation of training in PCC can be due to practice failure and complaints, which is unlikely to modify practice as the environment will lead to practitioner burnout and the abandonment of practices encouraged in the on-going support (Sinclair et al., 2021). Alternatively it has been shown that a clear learning climate fosters behaviour change implementation through commitment, motivation and confidence (Davies et al., 2019; Davies et al., 2018).

6.6 Chapter Conclusion

The theory testing undertaken in this chapter verified the importance of all resources packaged with programme theory. Behaviour change frameworks, supportive leadership, partnerships with medical professionals, and on-going support were valued by those working in ERSs. Many aspects of programme theory were also associated with implementation scores. The contextual factors which facilitate these resources influencing implementation, and the explanations of how they exert influence, were largely supported by levels of agreement and qualitative data. Novel

contribution to programme theory was also provided for all four areas including the potential for motivation and capability mechanisms to dictate changes to implementation. The conditions which trigger the separate mechanisms were also unpicked, which provides an original contribution to knowledge for implementation science, ERSs, and behaviour change science.

The following new knowledge was gleaned from this phase of the work.

- Practitioners gain increased capability through behaviour change frameworks when they feel behaviour change is integral to their work and they are faced with difficult attendees who do not respond to their usual practice.
- Having GP's who value ERSs provides an additional emotional element to the motivation mechanism. Where the GPs engage with the service in a behaviour change manner, it can enhance the decision making capability of practitioners. Moreover, it can create a ripple effect, in which attendees are easier to work with as they see the scheme in a credible way and attend with clear expectations and motivation to engage.
- The role of supportive leadership attends to a capability mechanism when there is organisational buy in and there are opportunities for vicarious learning and role modelling.
- On-going training triggers changes to motivation as support evolves practitioners augment their professional identity, value the collective morale, and progress through transformative learning.

The concluding chapter of the thesis will summarise the key findings, articulate the original contribution to knowledge, discuss the limitations of the thesis and make recommendations for future research and practice.

Chapter 7: Discussion

7.1 Chapter Overview

The final chapter critically examines the findings of this thesis by comparing them to the existing literature, whilst inspecting if the thesis aims and objectives were met. Initially, the chapter summarises the results and evaluates how the areas of behaviour change frameworks, partnerships with medical professionals, supportive leadership, and on-going support compares to the current body of evidence on implementation. The chapter also presents the original contribution to knowledge emerging from the thesis findings. Subsequently, the chapter highlights the implications of the findings for future research and practice as well as considering the thesis limitations, acknowledging the lessons learnt and drawbacks to the research.

7.2 Chapter Introduction

Increasing PA is unequivocally advocated across international and national policy due to the role it plays in mitigating health challenges (Dempsey et al., 2022). Inactive individuals, at high risk or with a LTC, have the most to gain physiologically from increasing their PA levels (Ekelund et al., 2020). The biomedical and economic perspective of PA for health dominates, which arguably led to the popularity of exercise prescription and subsequently ERSs. There is, however, a tension between providing an appropriate exercise prescription to attenuate disease risk and prioritising the holistic experience for the person (see Chapters 1, 2 & 6). The incongruence of the biomedical and biopsychosocial requirements of ERSs, which evidence largely ignores, may partially explain the limited impact ERSs have on PA levels (Campbell et al., 2015; Pavey et al., 2011; Rowley et al., 2018).

Recently there has been a resurgence and diversification of ERSs to support individuals with LTCs (Covington et al., 2019; Myers et al., 2021; Stout et al., 2020). Unfortunately, the recommendations largely focus on appropriate exercise prescription, equipment, and risk management without considering the attendee's experience or how to facilitate behaviour change. Conversely, other authors recognise the complexity of PA and have discussed the implications of external factors, for example, socio-spatial processes (e.g. gender ideals) (Coen et al., 2018) and how the influences on PA will be in flux over time (Heino et al., 2021). Contextual factors like

time, socio economic status, environmental factors, individual characteristics and socio-spatial processes will influence the attendee's experiences, but also the translation of behaviour change guidance to practice. Nevertheless, evidence examining the processes of implementation and the mechanisms of implementation strategies, are underdeveloped (Brownson et al., 2022; Dryden-Palmer et al., 2020; Geng et al., 2022).

7.3 Summary of Thesis Findings in Comparison to Existing Evidence

The purpose of this thesis was to explore how, why, and in which circumstances behaviour change practices are implemented by exercise referral practitioners. The objective was to develop context specific theories to explain how fidelity to ERS behaviour change policy recommendations are being achieved, or not. Several of the chapters in this thesis provided an evaluation of emerging findings from this thesis in comparison to established literature (Chapters 4, 5, 6). The discussion of the findings and evidence consulted was however specific to each phase (e.g. survey development, realist theory to corroborate findings). The following subsections examine the findings of the thesis in comparison to the implementation literature generally, while attending to the assumptions drawn from the narrative review in Chapter 2.

7.3.1 Defining Successful Behaviour Change Implementation

The first research objective was to identify how behaviour change practice is defined and operationalised in ERSs. Policy documentation, in the ERS sphere, consistently recommends the application of person centred interpersonal skills, a suite of BCTs, and the application of a psychological model of behaviour change (BHF, 2014; DOH, 2001; NICE, 2014). Yet, as discussed in Chapter 2, the conceptualisation of behaviour change practices is not uniform, often conflated, and the measurement of practice is poor.

Additionally, the literature exploring the feasibility and acceptability of applying behaviour change practices in ERS settings is lacking (Czosnek et al., 2020; Quedstedt et al., 2017; Stevens et al., 2022). Research has also insufficiently examined how exercise practitioners can support behaviour change generally (Stevens et al., 2022). Not surprisingly, evidence has shown that PA interventions are unable to achieve sustained behaviour change in attendees once the intervention ceases (McEwan et

al., 2020). This section will now address what successful behaviour change in ERS entails, by comparing the expectations from policy with the existing literature.

Although exercise referral policy encourages the implementation of BCTs, the utility of BCTs has been questioned. Evidence suggests that the widespread application of approaches, such as goal setting, are not based on empirical evidence, are applied sub-optimally, and can have harmful consequences (Swann et al., 2022). Likewise it has been shown that a range of self-regulatory BCTs worsen psychosocial predictors of behaviour change, and PA levels, in older adults (French et al., 2014). There is also a lack of rationale for the combination of BCTs chosen and no articles, in a recent review, had the same combination of BCTs (Carraça et al., 2021). Although this is appropriate, due to the diversity of settings, it raises questions about how behaviour change practices are chosen.

Behaviour change literature is growing, recognising the influence of contextual factors on outcomes (Bishop et al., 2015). Guidelines for developing complex interventions stress the need to map the local determinants of behaviour to guide the selection of appropriate tools based on behaviour theory (Kok et al., 2016; O’Cathain et al., 2019). Yet, the assumptions about how BCTs influence behaviour are underdeveloped (Hagger et al., 2020), based on averages, and assume that behaviour change is linear and constant (Heino et al., 2021). Although tailoring the use of BCTs rooted in classic behaviour theory is progressive compared to what currently exists, it fails to account for individual responses that may be experienced during routine ERS practice. A more dynamic approach would be for practitioners to specify the behaviour that needs changing, the person/people that could enact the action, the specific location, emotional context, or social setting in which the action is performed, the target that needs changing and when the action will take place (Patey & Grimshaw, 2022; Penseau et al., 2019). Seeing behaviour change practice as a flexible endeavour that requires the consideration of diverse factors has ramifications for intervention design, expectations of practice, and the reporting of practice.

Critiques of BCT taxonomies are evident in the literature, which challenge using a standard suite of BCTs, as outlined in ERSs policy. It is argued that BCT taxonomies focus entirely on intervention content, ignoring how interpersonal styles interact with BCTs which may explain the variable outcomes (Hagger & Hardcastle, 2014;

Hardcastle, 2016; Hilton & Johnston, 2017). The underappreciation of how BCTs are implemented is a noteworthy limitation in the field of behaviour change practice. Authors argue that taxonomies overlook the relational aspects of practice, creating an impartial overview of behaviour change approaches (Gagnon et al., 2018; Marks et al., 2022).

The recommendation of ERS policy to employ PCC suggests that the stakeholders involved in policy guidance recognised the need to consider the relational aspects of practice in addition to specific techniques. Yet, the definition of what PCC in ERSs entails is vague, which resonates with wider issues in PCC research (Grover et al., 2021; Zoffmann et al., 2016). Consultation with the PCC literature provides some clarity on the general principles and practices expected in practice. Reoccurring principles of PCC, that focus on the practitioner behaviour alone (Bikker et al., 2015; Dixon & Johnston, 2021; Grover et al., 2021; Lane et al., 2005; Slater et al., 2017), are outlined below and correspond to features noted in ERS policy guidance.

- Individualised care
- Empowerment
- Respect
- Collaboration and shared decision making
- Holism
- Communication (listening, understanding concerns, compassion, positive, clear)

Nevertheless, diverse terminology is used across disciplines and the implementation processes and local adaptations are largely unknown, creating fragmentation in the field (Downey et al., 2021; Grover et al., 2021). Against a backdrop where limited PCC guidance exists within ERSs, MI has been a popular option to operationalise PCC (see Chapter 2). It is known that PCC involves more than the competencies and practices of practitioners (Fortin & Stewart, 2021; McCormack et al., 2015; Slater et al., 2017), which has been verified by the results of this thesis (Chapter 6), however, MI could provide a set of principles and practices to guide practice in ERSs as it has a tangible framework of care, underpinning 'spirit' or philosophy, and established measurement tools and standards.

Despite the potential to provide a framework for ERS, implementation issues remain in the MI literature (Frey et al., 2021; Magill et al., 2018). Motivational interviewing involves general counselling skills but also aspires to strategically elicit change by developing discrepancy and resolving ambivalence (Lane et al., 2005). It is proposed that MI is a complex skillset requiring ongoing experiential, reflective, and technical support with feedback to ensure fidelity (Frey et al., 2021). The diverse applications of MI, the advanced learning required, and potential resources needed may have catalysed modifications from the original guidance. Modifications to MI are evident in the literature including behavioural counselling, which retains the principles of MI but deviates from seminal guidelines. Some authors define behavioural counselling as being less ambitious than MI, focusing solely on understanding the attendee's perspective and their plans for behaviour change (Lane et al., 2005). Conversely, others suggest that behavioural counselling is more comprehensive than MI, limiting the relevance of MI principles and fidelity tools (Vallis, 2013). Another common modification of MI is brief counselling which is a pragmatic framework to initiate behaviour change based on the five 'A's model (Assess, Advise, Agree, Assist, Arrange). Confusingly, some authors refer to brief counselling and MI in combination to ensure PCC underpins practice (Hassett et al., 2022). A modified MI, with a modest goal to demonstrate PCC, coupled with decreased expectations about competencies, may be more amenable to exercise settings due to expertise of practitioners and emphasis on PA (Beck et al., 2016; Lion et al., 2018). Yet, there is a scarcity of research detailing what PA counselling entails, how it is implemented in real world settings, and how it is envisaged to produce outcomes (Breckon et al., 2008; Gagnon et al., 2018; Martiskainen et al., 2022).

The application of behavioural theory is envisaged to improve behaviour change by targeting impediments to change with evidence based strategies (Hagger & Weed, 2019). The self-determination theory is a common framework in ERSs and is now synonymous with PCC and MI (Duda et al., 2014; Markland & Tobin, 2010; Morton et al., 2008; Shore et al., 2019; Zoffmann et al., 2016). Despite the assumption that theory based practice improves outcomes, there is mixed evidence on the effectiveness of theory versus no-stated theory interventions (McEwan et al., 2019; Prestwich et al., 2014). Literature attempting to establish the effectiveness of theory based interventions is hindered by two salient issues. Firstly, establishing superiority,

through an experimental lens, requires a control group to receive uncontaminated usual care. Behaviour change practice is a complex intervention and withholding aspects like the intensity of a therapeutic relationship, empathy, and the implicit use of BCTs in real world settings, which would be needed for an uncontaminated control group, is not possible (Bishop et al., 2015; Dombrowski et al., 2016). Secondly, many interventions may only be *theory inspired* and therefore lack the specification on how the intervention is theory based and may subsequently have inadequate implementation (Hagger & Weed, 2019). The challenge of suboptimal theory integration has also been highlighted in ERSs, where explicit commitment to theory, reporting of interventions, and presentation of theory planning is deficient (Shore et al., 2019). Where PA interventions do commit to a theoretical underpinning the translation to practice is questionable, as later stages of planning and evaluation lack information on theory, confirming the issues with the utilisation of theory in practice (Bluethmann et al., 2017).

The translation of recommendations to practice is often conflated and assumes a linear process which is ill prepared to generate changes to routine practice (Gentry et al., 2020; Greenhalgh, 2018; Jones, 2018). The narrative review in Chapter 2 corroborates the issues highlighted in the behaviour change literature focusing on the integration of behaviour theory. There is a partial commitment to theory, completeness of theory is not evident, and fidelity testing is lacking. Although critiques exist on the role of behaviour theory, mitigating factors must be considered to avoid inappropriate conclusions being drawn. Seminal work provides noteworthy support on how theory can guide practice, if theory is used in a comprehensive manner. Theory based interventions strengthen practice by highlighting important impediments to behaviour change (Hagger et al., 2020; Hagger & Weed, 2019).

Although vague, the recommendations of ERS policy to consider a suite of BCTs, the application of psychological theory and the interpersonal approach aligns with current thinking on optimal practice (Dombrowski et al., 2016). There is, however, a need to consider the complexity of practice and the operationalisation of these approaches is fraught with challenges, as outlined by the literature. Table 7.1 outlines how the research undertaken in this thesis addressed the challenges outlined above, when formulating a tool to appraise the implementation of behaviour change practices.

Table 7.1. Approaches taken in this thesis to overcome the issues with defining behaviour change practice

Current issue	Resolution
Inadequate tailoring of BCTs	Vignettes were based on co-produced profiles representing a range of typical individuals, overcoming the recommendation to apply a suite of BCTs in a standardised manner.
No rationale for the selection of BCTs	BCTs were based on the personas from the co-produced work which provided inductive impediments to change. These impediments were then cross checked with the COM-B, and theory and technique tool, to provide justification of which combination of BCTs were appropriate.
Relational element of BCTs lacking	PCC counselling skills were conceptualised as a discrete outcome in this thesis. Vignettes were developed in a manner which encouraged respondents to detail ‘the kind of conversation they would have’ with the attendee. Vignettes also included content which provided respondents the opportunity to articulate their delivery style.
Diverse operationalisation of PCC	Vignettes were developed to include opportunities for respondents to demonstrate PCC as defined by Lane and colleagues (2005).
Conflation of practice to psychosocial determinants of behaviour	The vignettes included information to allow respondents to demonstrate holism.
Inadequate integration of theory	The COM-B was used to shape the vignettes and clear definitions guided the generation of putative targets for practice.
Poor linking of theory to evidence based strategies	The behaviour change taxonomy, and subsequent theory and technique tool, consolidated the best current evidence on the mechanisms of action of each BCT. This tool guided which combination of BCTs would be appropriate for behaviour change practice.

7.3.2 The Role of Behaviour Change Frameworks in the Implementation of Behaviour Change Practices

The subsequent research objectives focused on identifying, and testing, factors that influenced the implementation of behaviour change practices by ERS practitioners. The objective was to develop causal configurations of how resources interact with local conditions to augment the reasoning of practitioners to implement behaviour change practices.

The first theory area proposed in this thesis refers to how behaviour change frameworks support practitioners to implement behaviour change practice. It was found, through this thesis, that behaviour change practice frameworks (manuals or procedures) positively influence the motivation and capability of practitioners. Frameworks are proposed to increase motivation when practitioners are passionate about empowering attendees and organisational commitment aligns to PCC by adopting appropriate monitoring. Furthermore, when there is congruent practitioner and organisational commitment to behaviour change, frameworks are proposed to increase capability in response to challenging attendees. These findings will now be compared to existing literature forthwith.

The narrative review in Chapter 2 consolidated the role of organisational factors in supporting the implementation of behaviour change practices in exercise settings. The interactive nature of organisational, environmental, attendee, and practitioner factors was, however, not established in the narrative review. Nonetheless, organisational commitment, as well as practitioner characteristics, the two prudent contextual factors outlined by respondents in this thesis, in relation to behaviour change frameworks, were present in the narrative review.

As outlined by respondents in the survey (Chapter 6), the beliefs of practitioners influenced the implementation of behaviour change practices. Several authors have verified this and outline that positive, committed, and enthusiastic practitioners are associated with implementation. Moreover, positive experiences were thought to provide a feedback loop and reinforce beliefs about professional identity (Dineen et al., 2022; Hoekstra, et al., 2017a; Shore et al., 2022), confirming the data provided by respondents during the survey phase of this thesis. Person centred care literature also describes the importance of enthusiasm, commitment, and compassion for

implementation (Bikker et al., 2015; Dixon & Johnston, 2021; Fortin & Stewart, 2021; Fridberg et al., 2021; Grover et al., 2021; L. Moore et al., 2017; Pola-garcia et al., 2022; Ryan, 2022; Slater et al., 2017; Spigel et al., 2022; Zhao et al., 2022).

The respondents in this thesis (Chapter 6) did not reach consensus on the importance of organisational commitment, however, most suggested that organisational buy in was a pre-requisite to capitalise on various resources (supportive leadership, on-going training, behaviour change frameworks). In the results of this thesis it was noted that a lack of time, high pressure, practitioner burnout, and an incongruent service priority hindered ERS practitioner's ability to utilise actual or hypothesised resources to support implementation.

The narrative review undertaken in Chapter 2, in line with the original data from this thesis, highlights how the presence of a behaviour change agenda influences practice norms and provides opportunities to align practice with a behaviour change vision (Buckley et al., 2018; Dineen et al., 2022). Organisational commitment, and subsequent service support, are also consistent features of the PCC literature, verifying the findings from this thesis. Adequate time, space, and financial support are all linked with greater PCC implementation (Fortin & Stewart, 2021; Fridberg et al., 2021; Grover et al., 2021; Kindblom et al., 2021; Moore et al., 2017; Pola-garcia et al., 2022; Scholl et al., 2018; Spigel et al., 2022; Zhao et al., 2022), substantiating the original results from this thesis. Additionally, several authors highlight that a clear commitment to PCC is necessary to ensure implementation is not competing with contrasting routines (Davies et al., 2018; Fridberg et al., 2021; Pola-garcia et al., 2022; Scholl et al., 2018; Spigel et al., 2022; Zhao et al., 2022). Respondents in this thesis outlined how an incongruent organisational vision was narrow sighted, dictated a service format that impinging on behaviour change practices, and created a difficult working environment thus hampering motivation.

The wider literature extends these findings, highlighting the necessity for truncated workload and ensuring a staff/attendee ratio that encourages the implementation of PCC (Kindblom et al., 2021; Spigel et al., 2022). There is also a need for a flat hierarchy of power, collaboration with practitioner's, feedback loops, and shared decision making for the successful implementation of PCC (Ryan, 2022; Scholl et al., 2018; Spigel et al., 2022). Furthermore, organisational commitment requires more

than written statements of intent, and the climate should engender a sense of security in which PCC practices are expected and practitioners have autonomy to trial and modify practices free from rebuke (Davies et al., 2018; Fridberg et al., 2021; Kindblom et al., 2021; Ryan, 2022; Spigel et al., 2022). Correspondingly the measurement of success should privilege long term PCC outcomes and value experiences as outcomes, if PCC is to be implemented optimally (Ryan, 2022; Scholl et al., 2018).

Evidently the practice setting is a well-established area of importance for PCC implementation and is central to various models of PCC (Ryan, 2022). It is suggested that implementation largely relies on the care environment (McCormack, 2004). The label 'organisational buy in' was used in this thesis and encapsulated all the features outlined above. In essence, if PCC can be implemented successfully there must be a person centred culture, with corresponding organisational support (Ryan, 2022). The interplay between organisational resources, climate, and subsequent implementation are not established in the current body of evidence, however, the results of the thesis outline how an incongruent organisational commitment exerts influence of motivation in response to practice frameworks (and other theory areas below).

One of the necessary features of organisational support, suggested in the findings from this research, is the need to monitor the use of behaviour change frameworks (Chapter 6). Several authors in the narrative review undertaken in this thesis highlighted how practice manuals support implementation (Caperchione et al., 2021; Carr et al., 2021; Dineen et al., 2021b; Gustavsson et al., 2018; Hoekstra et al., 2017a; O'Shea et al., 2016), verifying the perspectives of the respondents in the current research. The examination of broader PCC implementation literature also corroborates the perspectives of respondents in this thesis, as it is proposed that written vision statements, terms of reference about care, and clear operating definitions are necessary for the implementation of PCC (Fortin & Stewart, 2021; Fridberg et al., 2021; Grover et al., 2021).

Within the current thesis some respondents provided caveats about the utility of practice frameworks (Chapter 6). A minority of the cohort outlined that frameworks must not dictate practice or impose a rigid approach to care. This is verified by established research which states that practice guidelines require clarity to operationalise behaviour change practices but also flexibility to allow adaptation for

specific scenarios (Moore et al., 2017; Myers et al., 2021; Pola-garcia et al., 2022; Ryan, 2022; Scholl et al., 2018; Spigel et al., 2022; Zhao et al., 2022). The role of adaptations in implementation is a contemporary topic and it is known that innovations should articulate their essential features and facets open for adaptation to support implementation (Haley et al., 2021; Movsisyan et al., 2019; Olaniran et al., 2022), which reinforces the perspectives from the respondents in this thesis.

The current thesis proposed that monitoring is the essential context to trigger responses to behaviour change frameworks supporting implementation (Chapter 6). Examining the evidence base validates these findings, although the boundaries between supportive leadership and practice frameworks is not discrete. The role of audits, personalised feedback, and monitoring for implementation are established in the current evidence (Moore et al., 2017; Myers et al., 2021; Pola-garcia et al., 2022), and proposed by the findings in this thesis. Furthermore, leadership is a platform to operationalise monitoring stimulating reflection, setting expectations, and providing a space for learning (Moore et al., 2017; Ryan, 2022; Zhao et al., 2022). Therefore, there is a need to ensure leadership includes diverse features to support implementation.

It was also found in this thesis that practice frameworks influence capability when faced with challenging attendees (Chapter 6). Literature in exercise settings has also highlighted that attendee factors influence behaviour change practices. Attendees who are challenging, closed off, resistant, or those lacking motivation were associated with poor implementation outcomes (Raposo et al., 2020; Reale et al., 2021; Shore et al., 2022). Working with attendees of this persuasion decreased practitioner's confidence and optimism to impact behaviour change noted by respondents to the survey (Chapter 6) and the narrative review (Chapter 2). The influence of attendee characteristics on implementation is corroborated in the wider literature where passive, uninterested, and unmotivated individuals create frustration for practitioners and worse implementation outcomes (Fridberg et al., 2021; Moore et al., 2017). Alternatively motivated, capable, and adherent attendees are facilitators for the implementation of PCC (Moore et al., 2017).

The wider literature also outlines the tension between the biomedical model and a PCC model. Implementation is challenged when attendees expect, and have experienced care, which is disempowering and positions the practitioner as the

decision maker (Moore et al., 2017). There is also a tension to prioritise the medically optimal choice over attendee autonomy, especially in challenging attendees (Davies et al., 2018; Fridberg et al., 2021). The disjoint between the medical agenda and valued behaviour change practices was noted in Chapter 2, Chapter 4, and Chapter 6 showing the importance of a working culture, which is aligned to behaviour change practices.

There is evidence verifying the role of behaviour change frameworks in improving practitioner capability when faced with more complex attendees, as proposed in the findings of this thesis (Chapter 6). In a two year follow up study by Kindblom and colleagues (2021), which aspired to enhance the implementation of PCC with practice guidelines, it was found that reliance on frameworks was more evident during early implementation or when practitioner's lacked knowledge, skills, or confidence. Similarly, it has been shown that practice guidelines increase the knowledge and skills of practitioners, yet the complexity of attendee's challenge good practice, and where frameworks do not include strategies for specific groups, it is a barrier to implementation (Davies et al., 2018).

7.3.3 The Role of Partnerships with Medical Professionals in the Implementation of Behaviour Change Practices

The second theory area from this thesis relates to how partnerships with medical professionals supports ERS practitioners to implement behaviour change practices. The current findings of this thesis (Chapter 6) propose that partnerships with medical professionals supports implementation through changes to motivation and capability. It was found in this thesis, through testing programme theory, that motivation is enhanced when medical professionals are supportive of ERSs, practitioners are committed to attendee empowerment, and clear communication between the professions exists. Partnerships with medical professionals is also proposed to increase capability when committed practitioners receive reinforcement of their practice through their interaction with medical professionals, as evident in the results from Chapter 6. The survey results also proposed that having medical professionals value the service primes attendees, increasing the perceived credibility of the scheme, therefore making the implementation of behaviour change practices easier. The novel

insights from this thesis will now be compared with other literature focusing on the role of partnerships to support implementation.

The importance of partnerships with medical professionals, as highlighted in the original contribution of this thesis, was also noted in the narrative review (Chapter 2), however, the current literature does not unpick how partnerships exert influence on implementation. Collaboration and communication between the professions is seen as important for shared ownership, role clarity, and advocacy, as proposed by participants in the research undertaken in this thesis (Chapter 4 & 6). In line with the findings from this thesis, there is a lack of integration, awareness of ERSs, or a common agenda between professions, creating a difficult setting to implement behaviour change practices. Moreover, where medical professionals support ERSs it increases credibility and the attendees are more receptive to care, therefore facilitating the implementation of behaviour change practices as noted in the thesis findings and verified elsewhere (Caperchione et al., 2021; Carr et al., 2021a; Gustavsson et al., 2018; Purdy et al., 2022).

Consultation with the wider literature supports the role of intersectoral partnerships for implementation. Where key groups are involved in the development, and operation of services, it increases shared ownership, role clarity, and the existence of a collective vision. Where cross profession collaboration is achieved, communication is greater therefore fostering improved coordination and team functioning, leading to better implementation (Fortin & Stewart, 2021; Pola-garcia et al., 2022; Scholl et al., 2018; Zhao et al., 2022)

Although partnerships and communication enhance intersectoral working, the findings from this thesis outlined the importance of medical professionals' commitment to ERSs (Chapter 4 & 6). The literature reinforces the importance of shared values pertaining to PCC implementation. There is a need for each professional group to understand each other and their corresponding motives to develop a shared goal. An iterative and collaborative process is needed to ensure expectations are co-developed and one profession is not adopting counterproductive practices. This process is facilitated when members of the professions converse in a manner that is recognised, trusted, and seen as useful, which helps consolidate joint priorities and flatten power differentials

this in turn supports the spread of innovative practices (Fortin & Stewart, 2021; Fridberg et al., 2021; Moore et al., 2017; Myers et al., 2021).

In addition, the current findings propose that intersectoral partnerships create a group learning climate (Chapter 4 & 6). The presence of partnerships with diverse backgrounds is known to stimulate reflection, challenge routine thinking, provide alternative options and surface tacit knowledge for sharing, thus increasing the competencies of practitioners (Davies et al., 2018; Kindblom et al., 2021; Spigel et al., 2022), which resonates with the propositions outlined in the findings of this thesis (Chapter 6).

7.3.4 The Role of Supportive Leadership in the Implementation of Behaviour Change Practices

The third theory of this thesis corresponds to the role of supportive leadership enhancing implementation. The findings of the thesis propose that both capability and motivation explain improved implementation of behaviour change practice in response to supportive leadership (Chapter 6). Respondents of the survey demonstrated that supportive leadership enhances motivation when there is a clear organisational commitment to behaviour change practice and practitioners are passionate about their role to empower people to change. It was also found, in this thesis, that supportive leaders can create a learning climate where reflection, role modelling, and vicarious learning augment committed practitioners' capability to implement behaviour change practices (Chapter 6). These novel findings are compared to the existing literature in the below paragraphs.

The importance of organisational and practitioner commitment has been discussed previously in this chapter. Within a supportive climate, it was proposed, by participants in this thesis (Chapter 4 & 6), that leaders can allocate resources, champion practice, manage logistics, develop intersectoral working, and trigger monitoring and feedback tools that positively influences implementation. This was outlined in the narrative review, substantiating the findings from this thesis (Carr et al., 2021b; Dineen et al., 2022; Gustavsson et al., 2018; Hoekstra, et al., 2017b. Moore et al., 2013; Raposo et al., 2020). Furthermore, the narrative review positioned local leaders as sources of expert advice and peer support and emphasised the necessity of a learning climate for implementation (Chapter 2). Nevertheless, the existing evidence relies on barriers

and facilitators to implementation without considering the causal and context specific manifestation of these factors, which the current thesis attends to.

Consultation with wider evidence substantiates the findings from this thesis. Supportive leadership that espouses PCC motivates practitioners (Sharma et al., 2015). Local leaders create practice expectations, monitor and evaluate practice, and operationalise the organisational agenda that empowers practitioners to align their practices to what is permitted (Fortin & Stewart, 2021; Moore et al., 2017; Ryan, 2022; Spigel et al., 2022). It is also essential that leaders are supported within a conducive organisational culture, if their activities are to maximise the motivation of practitioners (Belrhiti et al., 2020; Birken, 2019).

Local leaders also act as role models and foster learning through supervision, mentorship, peer support, and facilitating critical reflection, which was an emergent finding through testing programme theory (Chapter 6). Leaders engender a learning climate by creating peer learning as a central part of practice. Importantly, as outlined in the findings of this thesis, the learning climate is suggested to be particularly relevant when practitioners are working with challenging attendees (Chapter 6). It is proposed elsewhere that reflection, with a knowledgeable leader, provides a platform for scenarios to be discussed and solutions generated (Davies et al., 2018; Ryan, 2022; Spigel et al., 2022). This corroborates the data from this thesis, outlining that increased competence is gained from situations where the leader provides a platform to devise options not in their usual repertoire.

Most of the existing evidence offered limited explanatory information on how contextual factors interact and often used the label motivation in an informal manner. Nevertheless, one paper did outline that reflection, in response to challenging attendees, maintains practitioner confidence (Davies et al., 2018). This contrasts with the mechanism proposed from this thesis which suggests that increased capability explains changes to implementation via reflection and vicarious learning. The authors also suggest that where there is a knowledge and skills gap, learning tools increase capability, leading to additional confidence (Davies et al., 2018). If increased confidence is the outcome of improved capability, discerning how peer reflection maintains confidence is difficult. It is not explored by Davies and colleagues (2018) if additional improvements in capability, via reflection with a leader, precede continuing

confidence, therefore improving implementation. A recent integrative review, which aspired to detail the mechanisms pertaining to leadership activities, provided nuanced detail on how meaningful learning, changes to capability, and confidence interact. The authors propose that where dedicated space is provided for reflection, and the leader is a trusted knowledgeable source of information, key outcomes are achieved, namely increased capability and confidence (Albers et al., 2022). The process creates a climate for the absorption of new knowledge, altered perspectives, and experimentation thus enhancing meaningful learning. The meaningful learning consequently increases confidence, as practitioners feel they gain more ideas about practice, achieve personalised information, have greater clarity on practice, ideas are achievable, and problem solving has occurred (Albers et al., 2022). This review verifies the hypothesis outlined above on why the Davies and colleagues' paper (2018) proposes a separate mechanism and validates the findings from this thesis.

Other PCC research confirms the role of increased capability through the provision of reflection and vicarious learning, without a granular exploration of how the provisions interact with contextual factors (Spigel et al., 2022). The role of local leadership is a salient issue in implementation science generally. The activities of middle managers to support implementation has recently been synthesised and further corroborates the current findings, including how coaching, enabled by a congruent organisational strategy, supports implementation (Boutcher et al., 2022). Once again coaching and mentoring are proposed to enhance capacity building, providing additional support for the role and changes to capability as proposed by the thesis findings.

7.3.5 The Role of On-going Support in the Implementation of Behaviour Change Practices

The final theory of this thesis relates to the role of on-going support, including ongoing training and peer support, to enhance implementation. The results of the thesis propose that on-going support enhances implementation through increasing the capability and motivation of practitioners. On-going support accelerates motivation when there is an organisational commitment to behaviour change and practitioners are cognizant of the purpose, and practices, required to fulfil their role. Inexperienced practitioners largely achieve increased capability from on-going support, whereas more experienced practitioners gain through changes to motivation. The role of on-

going support for implementation is explored below by critically examining the existing literature.

There is a general consensus that training and on-going support enhances the competency of the workforce, which is essential for implementation (Fridberg et al., 2021; Moore et al., 2017; Pola-garcia et al., 2022; Ryan, 2022; Scholl et al., 2018; Slater et al., 2017; Zhao et al., 2022). Evidence is also emerging that the dominant conceptualisation of practitioner support underplays the role of '*street level*' actions, which are the subtle constructive efforts, that often go unnoticed, in response to the complexities of day to day work (Klemsdal et al., 2022). Consequently, evidence is starting to demonstrate that on-going support has transformative features depending on specific contexts, which is in line with the findings from this thesis. Training can alter perspectives and validate or create cognitive dissonance with personal schemas (Bansal et al., 2022; Davies et al., 2018; Ryan, 2022). In support of the current thesis findings, educational resources improve procedural knowledge but the benefits to capability plateau as innovations mature. As experience increases, on-going support facilitates peer interaction, practical knowledge sharing, and increased awareness (Kindblom et al., 2021). Although other authors (see Bansal et al., 2022) outline how a biomedical perspective alters responses to PCC training, the current work emphasised how on-going support operates when practitioners *are* committed and cognizant to behaviour change practices.

The influence of the on-going support format was not elucidated in the current findings of the thesis, which requires additional research. The label on-going support, informed by the results from Chapter 4, encapsulated training, mentoring, appraisals, and feedback loops targeting both capability and motivation mechanisms (Downey et al., 2021). The coverage of theory area is indicative of the '*street actions*' alluded to earlier in this section, as the ethnography undertaken in Chapter 4 provided the platform to capture everyday actions, which is essential to understand the determinants of successful implementation (Cloutier et al., 2016). Multifaceted support, especially on-going support, yields more successful outcomes (Herschell et al., 2010), yet, it may be inappropriate to appraise evidence based on individual components, due to the complexity of local implementation and need for local innovation (Birken & Currie, 2021).

The crossover between on-going support and supportive leadership cannot be ignored as local leaders are the intermediaries to respond to situations and make practical modifications based on local issues (Klemsdal et al., 2022). The generation of a learning climate by local leaders, as outlined previously, creates a setting where practitioners become self-aware, feel safe to experiment with new ideas, and gain knowledge and problem solving skills (Albers et al., 2022). This illuminates how on-going support will augment beliefs and knowledge contingent on dynamic features like maturity and practitioner deposition, as noted in the findings of this thesis.

7.3.6 Section Summary

The field of implementation science has copious amounts of unstructured data outlining the general barriers and facilitators to practice and acknowledges the influence of context, yet, explanatory research on the process of implementation is lacking (Dryden-Palmer et al., 2020; Liu et al., 2018). The novel findings of this thesis outline how behaviour change frameworks, partnerships with medical professionals, supportive leadership, and on-going support uniquely influence the implementation of behaviour change practices, which has been substantiated by contemporary literature. Yet many features of implementation are described but under theorised; supportive leadership being a noteworthy example (Klemsdal et al., 2022). The nascent literature on mechanisms of implementation is developing, and the current findings contribute to this field by outlining how various known resources exert their influence to achieve implementation success.

7.4 Novel Contributions to the Literature

The implementation of PA policy must transition from '*nice to do*' to '*must do*' due to the role PA plays in health and wellbeing (Stamatakis & Bull, 2020). The utility of ERSs, as one potential policy option, has been questioned in terms of cost effectiveness and the likelihood of improving PA in attendees (Campbell et al., 2015). Research continues to privilege positivist assumptions, yielding similar conclusions about the limited impact of ERSs (Taylor et al., 2021). It has been suggested that the available research is '*failing*' ERSs as there is a paucity of research exploring what practitioners deliver and the components of ERSs remains largely unknown (Hanson et al., 2020).

The goal of ERSs is to provide a person centred experience and facilitate behaviour change, yet, evidence does not define practice, prioritise service quality, or undertake implementation evaluations (see Chapter 2). If ERSs should be person centred (DOH, 2001) a more holistic view of success is required (Mills et al., 2012). Defining implementation success is a vital element of building a robust evidence base for PA programmes, which is largely overlooked in PA literature (Gray et al., 2021). The current thesis spent time exploring and defining what behaviour change practice entails by consulting the contemporary literature and clearly stating the implementation expectations, therefore advancing the field.

The poor exploration of behaviour change implementation is not unique to ERSs. Despite the impressive nascent behaviour change literature, recognition of behaviour change practices for health, and widespread application in practice and research, comparatively less is known about how and why fidelity to behaviour change practice occurs (Toomey et al., 2020). Ironically, behaviour change science has advanced implementation science but there is limited work identifying how behaviour change practices are implemented across disciplines (McHugh et al., 2022; Penseau et al., 2021). Other authors stress the need to undertake research exploring the implementation of behaviour change practices yet this has received little attention (Lobczowska et al., 2022; Luszczynska, 2020). The current thesis advanced the field of behaviour change science by focusing specifically on the implementation of practices, and using established frameworks (CFIR, COM-B) to abstract granular data into portable, context sensitive theories on how implementation may be achieved.

Although the application of implementation science has increased substantially, research is dominated by epidemiology, the evaluation of implementation processes is lacking, and practitioner behaviour is usually conflated to rational thinking alone (Brownson et al., 2022; Dryden-Palmer et al., 2020; Nilsen et al., 2022). Implementation science has grown rapidly in recent years, and copious conceptual frameworks now exist guiding efforts to resolve the chasm between optimal delivery and practice. Yet, there is a need to apply, test, and refine theory to accumulate knowledge about what works, for whom, and why, with regards to successful implementation (Damschroder, 2019). The current thesis advances implementation science by attending to and understanding prudent aspects of context, by subjecting frameworks and theories to theory testing, refining how theory works in action, and

populating an understanding of how known conceptual factors exert influence on implementation outcomes.

The current thesis also unpacked the quality of behaviour change practices in a sample of ERS practitioners, the resources that drive implementation, how resources exert their influence, and the contextual factors needed to catalyse mechanisms in ERS settings. The original contribution to knowledge is salient for the following reasons. Firstly, although ERSs have been a victim to COVID-19 and interest has waned following the NICE (2014) guidance, there has been a revitalised interest in their role in local health systems (Public Health Scotland, 2022). Secondly, many non-traditional PA pathways are emerging, which retain the model of ERSs but diversify their purpose. For example, the role of social prescribing for increasing PA has recently been discussed (Dayson et al., 2022; Downey & Golder, 2021). The original knowledge generated in this thesis provides portable ideas to inform the planning of other community-based PA programmes to increase the likelihood of behaviour change implementation. Thirdly, the original knowledge in this thesis addresses the gap in the literature on how behaviour change practices are implemented, which is noteworthy to the broader field of health promotion. Lessons can be transferred to the wider behaviour change field, which has arguably ignored fidelity (Luszczynska, 2020; Toomey et al., 2020).

The current research provides recommendations not just about the individual factors that influence the use of behaviour change practices, but also the conditions that are needed to achieve successful outcomes. This provides guidance on what is needed, how it is envisaged to support implementation, and potential moderating factors that interact with key resources. The use of established frameworks and theories also provides consistency of terminology for others to test and refine these findings in other settings, therefore advancing the field further (Damschroder, 2019). The current findings add to the broader field of implementation science by undertaking evaluation that populates an understanding of how context influences implementation outcomes, employing methods that are sensitive to the effect of social structures on outcomes, adopts a multidisciplinary lens, and engages with key audiences to increase the dissemination of work to enhance practice (Brownson et al., 2022; Nilsen et al., 2022). Lastly, by adopting a realist lens, and proposing context dependent configurations of causality, it addresses the chaos in the implementation field which is overflowing with

models, frameworks, and theories but lacking insight on how and why implementation in specific scenarios fails or succeeds (Sarkies et al., 2022).

7.5 Critical Reflections of the Programme of Research Undertaken

There are noteworthy strengths to the body of research undertaken in this thesis. The thesis responded to calls that there has been suboptimal evaluation in ERSs and alternative approaches are needed to avoid inappropriate inferences about the utility of ERSs (Oliver, et al., 2021).

The recommendations to use behaviour change practices is commonplace in a range of settings, including ERSs, however, there is a lack of research exploring the translation from evidence to practice (Presseau et al., 2021; Toomey et al., 2020). The current research therefore provides an antidote to the issues in the ERS, and behaviour change, literature.

There is also an insufficient exploration of implementation processes in knowledge mobilisation generally (Dryden-Palmer et al., 2020; Rogers et al., 2020). The adoption of realist evaluation advanced the implementation field by providing a platform to develop explanatory models on how context interacts with service activities to cause variation in implementation outcomes (Sarkies et al., 2022).

The combination of methods increased the integrity of the work and the ability to understand the complexities of implementation. The tradition of ethnography provided practices such as reflexivity, small talk, and observation, which supported the generation, and adjudication of ideas to understand complexity (Cribb et al., 2022; Decoteau, 2017; Gear et al., 2018). Due to the philosophical assumptions of realism, personal presuppositions and the institutes where research takes part have real entities which permit how research is undertaken (Emmel, 2013; Maxwell, 2012). Often, how researchers arrive at a research question, map the contours of complexity, sample cases, and '*concentrate fire*' on the '*juicy bits*' (Astbury, 2018, p. 74; Pawson, 2013, p.33) goes unarticulated, decreasing transparency and leaving work open to ridicule. Adopting ethnography, and viewing it as more than a collection of methods (Hammersley, 2018), provided a decision trail and increased self-awareness to ponder alternative theories in naturalistic settings.

A greater understanding and application of ethnography can also overcome many challenges that currently exist in realist evaluation. Several issues that were negated were as follows (Jones, 2018; Porter, 2015a; Rolfe, 2019):

- the ability of practitioners to conceptualise mechanisms
- distinguishing context from mechanism
- the burden of co-theorising leading to limited information
- clarity about the approach
- the resources needed
- the reductionist nature of the CMO

The use of mixed methods, and the realist survey, to empirically test programme theory responded to on-going calls to legitimise realist theory (Bonell et al., 2022; Mukumbang, 2021; Ravn, 2019). It is argued that mixed methods are a vital part of realist evaluation, which has largely been a qualitative endeavour (Hawkins, 2014; Hawkins, 2016). The benefit of exploring the patterns of outcomes in the empirical realm provided fallible, but tangible, substantiation of theories, suggesting ideas may be closer to reality.

There are also limitations that must be noted when drawing conclusions from this body of research. The measurement of implementation was contingent on two features a) the definition of behaviour change practice and b) practice vignettes that corresponded to specific psychosocial determinants of behaviour. Although specific practices were adopted to ensure the responses corresponded to applied settings, there are limitations that must be noted. The vignettes attempted to cue practitioners to illustrate their interconnected practices of BCTs, use of theory, and form of delivery (Dombrowski et al., 2016). Nonetheless, the think aloud answers were heterogeneous. It was not possible to decipher if performance was based on implementation competencies or an insufficiency of some practitioners to think aloud. Naturalistic settings, for example recorded video consultations, may have provided a more accurate representation of behaviour change approaches. Nonetheless, the pretesting showed that the vignettes performed well when comparing scores from high performing practitioners across observation and think aloud responses. The development of the vignettes also adhered to guidance on developing vignettes, and utilised co-produced datasets as a starting point, increasing authenticity (Evans et al., 2015; Hrisos et al., 2009; Peabody et al., 2004; Skilling & Stylianides, 2020).

It was also noted, during the pre-testing of the vignettes, that the content and arrangement of the vignettes demonstrated good behaviour change practice. In essence, the vignettes provided practitioners with holistic information, showed commitment from the hypothetical attendees, and illuminated putative targets for practice. Although this could positively bias the performance of practitioners, as the vignettes highlighted key targets for behaviour change practice, it was evident during interviews and data analysis that all practitioners were unaware of the links between BCTs, psychological mechanisms of action, and overt PA counselling principles.

As alluded to earlier in this chapter, although the use of a priori frameworks and standardised language enhances the portability of findings, there are also shortcomings. Many CFIR constructs lacked relevance to stakeholders, encapsulated a diverse number of activities and deductive coding lost the granular meanings issued by interviewees. The mechanisms were also diverse and many of the labels within the TDF, that unpins the COM-B, were used. Abstraction was necessary to reduce data and consolidate diverse datasets, however, the labels spanned various aspects, potentially conflating causal configurations. For example, how various on-going support formats (types of training, types of mentoring, types of educational material) influence various features of motivation (e.g. habit, emotion, beliefs) was diluted by encasing numerous topics under broad theory labels. There is still the opportunity to explore each area in more granular detail, yet it was difficult to navigate each specific casual configuration noted within the data. Nonetheless, the research has sensitised, and verified, a range of salient areas of the ERS sphere and provided the essential contexts which trigger changes to practitioner's motivation and capability using established frameworks that provide portable ideas to test in other settings (Damschroder, 2019).

Due to the interest in both the qualitative and quantitative aspects of the survey expectations of rigour were diverse, which created a tension for the research. Some argue that the aim of a realist survey is to recruit a representative sample to be confident about inferences related to the patterns of implementation outcomes (Ravn, 2019). In contrast, realism assumes it is impossible to know the universe before you sample it and that characteristics in a sampling frame are not sufficient to group cases (Emmel, 2013). In practice, the survey sample size was small and included a large group of practitioners who were not typical of usual ERSs. This means the statistical

testing may be critiqued, although it does not lessen the value of the work through a realist lens. As Emmel (2013) notes, casing is subject to the same powers and liabilities inherent in the phenomena of interest. Many of the respondents who took part were motivated, involved due to their local leader, and were trailblazers in ERSs, which may decrease the representation of the cohort, but provides rich explanations for programme theory. The complexity of random sampling is noted elsewhere, and certain groups are often underrepresented in research, hampering the ecological validity of results (Antonacci et al., 2020; Burnette et al., 2022). Although motivated practitioners dominated the data, there was a diversity for the remaining cohort, with some having no support, while others had partial support. A greater sample size would have helped strengthen the quantitative portion of the realist survey (Ravn, 2019; Schoonenboom, 2017).

Lastly, the coding of implementation scores could have been strengthened by undertaking independent coding, completing the BCTTv1 training, and checking the sensitivity of the vignettes to actual practice.

7.6 Recommendations for Future Practice

The current thesis findings identified a need to ensure practitioners have the motivation and capability to implement ERSs to achieve its purpose. According to the original contribution of this thesis, and the crossover noted within theory areas, a supportive local leader is paramount to support the implementation of behaviour change practices. A leader can mobilise, prioritise, and invest in quality improvement and support the development of a learning climate. This culture, spearheaded by the leader, should promote self-reflection, provide personalised feedback, facilitate increased self-awareness, engender trust and partnership with medical professionals, and direct specific ongoing support. Optimal leadership should also include coordination, monitoring and evaluation, tailoring innovations, imparting information, engaging, and coaching others, allocating resources and being an influencer.

Moreover, the leader's commitment to behaviour change practice must be supported by the organisation in which they reside. This is illustrated by the current thesis findings which showed that an organisational, person centred climate is a necessary condition to activate mechanisms. Leaderships commitment to innovation is not passive and organisations must champion the behaviour change agenda, target the beliefs of local

leaders, and equip them to disseminate and spread innovations. Furthermore, local leaders may be key to generating partnerships with medical professionals. The chasm between medical professionals and ERS practitioners, the subsequent lack of reciprocity, fuzzy boundaries of care, and lack of communication are all salient issues in ERSs, as outlined in this thesis. Although the wider climate must provide a clear person centred agenda, those in leadership roles could be an antidote to the challenges behaviour change implementation faces in ERSs. The recommendations for future practice can be summarised as follows:

- Programmes must be clear on the goal of the scheme (exercise is medicine or person centred PA programme) and align commissioning criteria accordingly
- Local leaders should be valued and supported to act as intermediates between the service goals and empowering local delivery
- Practitioners must be committed to PCC and be motivated, and made capable, to implement behaviour change practices through the following provisions: clear operating frameworks for behaviour change, a flourishing learning climate, and operating within a referral network who values them and shows commitment to a person centred approach

7.7 Recommendations for Future Research

The current thesis findings contribute to the implementation science agenda by attending to how service elements interact, what moderators influence success, and how known factors exert their influence. The current work however only focused on a specific service and one specific domain. Future research should continue to explore how context influences implementation by building and testing configurations of how and why implementation is achieved across settings. Moreover, as evidence grows about salient areas, additional empirical verification will help strengthen the rationale to address key areas. For example, if leadership activities could be measured accurately and linked to increased practitioner motivation, patterns of implementation success could be attributed to specific practices (Birken, 2019). Having said that, implementation research is at a crossroads methodologically. To foster implementation, and learn about implementation in applied settings, more naturalistic, pragmatic, and theory driven evaluations are needed to increase the capacity of services, but also accumulate knowledge on how to narrow the knowledge to practice gap (Braithwaite et al., 2018; Ramanadhan et al., 2021; Sarkies et al., 2022). As

Pawson (2013) notes, evaluation is endless, so multiple cycles of evaluation are useful to refine theory and shift priorities due to the dynamic nature of health services.

Behaviour change research has been guilty of conflating practice and assuming discrete implementation. Continued efforts must be made to counteract the conflation of behaviour change to a list of standardised BCTs, as it is an imprecise view of human behaviour (Heino et al., 2021). A nuanced definition of behaviour change practices is needed to avoid inappropriate expectations and underplay the complexity of human behaviour. In addition, the reporting of behaviour change implementation needs improving, to refine traditional behavioural theory, by considering how diverse groups respond differently to practices and what specific psychological impediments change. Subsequently, greater attention is needed on the measurement of behaviour change practice to advance the field. The manner in which BCTs are utilised is as important as the techniques chosen (Dombrowski et al., 2016). The distinction between PCC and behaviour change practices is not discrete and minimum expectations of how they interlink are needed. Clear definitions of practice increase implementation and quality appraisal tools are necessary to advance the field. The current measurement of PCC is fraught with issues and greater tangible measurements are needed (Santana et al., 2019).

Specific to ERSs there is a need to withhold judgements about their utility or assume research has stagnated. To avoid a Type III error, research is needed that can unpick what is working, for who, in what circumstances, and why (Oliver et al., 2021). Of relevance is the need to partner with those in the schemes who have tacit knowledge about the challenges and opportunities for ERSs. Bottom up and co-produced approaches have the potential to enhance local assets, refine practice to meet local agendas, and accumulate knowledge on where ERSs work and what is needed for success (Buckley et al., 2018).

The incongruence between the delivery of ERSs and the biomedical culture is a noteworthy issue highlighted in the thesis findings and elsewhere (Shore et al., 2021). It was noted in the data that a biomedical culture may dissuade partnerships with ERSs. The medicalisation and risk/benefit mindset creates difficulties for GPs when appraising the utility of ERSs. Their focus on an exercise prescription may not be congruent with the ERS staff's views on practice. This discrepancy can quell the

development of trust. Another prudent aspect of the biomedical culture relates to the lack of commitment to using exercise as a therapeutic service. There are no champions of ERSs within the medical leadership sphere (Downey & Golder, 2021). Greater research is needed to decipher how the 'exercise as medicine' agenda may hamper ERSs. The recommendations for future research can be summarised as follows.

- Implementation science should continue to adopt approaches that can accumulate an understanding on how contextual factors influence the translation of policy and evidence to practice
- Research is needed to advance the measurement of salient features influencing implementation to strengthen the empirical verification of proposed causal configurations
- Naturalistic and co-produced approaches are needed to capture the complexities of implementation and provide a dual function to enhance the capacity for implementation and accumulate learning on how implementation can be achieved
- Behaviour change research must continue to develop a nuanced definition of core practices and reporting tools that are sensitive to the complexities of human behaviour
- Exercise referral research must consult with those in the system to learn about the opportunities and challenges of the current landscape
- There is an urgent need to research how the combination of biomedical and person centred attitudes co-exist and quell integration between the professions, as the lack of collaboration between the professions is an enduring issue

7.8 Thesis Conclusion

The systematic body of research undertaken in this thesis outlines priority features that influence the implementation of behaviour change practices in ERSs. Within prudent areas it proposes fallible, but verified, explanatory theories on how implementation can be achieved and what contextual factors are needed to galvanise success, thus addressing the thesis aim and objectives.

The results propose that four areas are fundamental to the implementation of behaviour change practices namely behaviour change frameworks, partnerships with

medical professionals, supportive leadership, and on-going support. The motivation and capability of practitioner's needs to be supported for implementation to be achieved. For the proposed areas to augment the motivation or capability of practitioners an eclectic mix of the following enabling conditions was noted- practitioner goals, attendee characteristics, medical professional commitment, and organisational climate (refer to section 7.3 for detailed causal configurations).

The original contribution of knowledge advances the field for the following reasons. Implementation science has traditionally dealt poorly with understanding how context influences implementation success. Behaviour change science has largely ignored the implementation of practices and recommended a suite of techniques without consideration of the form of delivery, their accessibility, and relevance. The current research has developed a holistic way to define and measure the implementation of behaviour change practices in a pragmatic manner and uncovered how the implementation of behaviour changes practices is influenced. Lastly, the findings contribute to contemporary calls to innovate ERSs research to consider how the historical diversity and underwhelming effect on PA can be explained.

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Appendix A

Interview Schedule to Develop Programme Theory



Introduction- The approach I am taking works by both of us actively discussing the service in relation to how it impact practitioners using behaviour change practices. I am looking for your experience within the scheme to identify what may impact the implementation of behaviour change science, and the circumstances that allow this to happen. You have the local expertise that I would like to draw out in relation to how the service works, and when it works/does not work. I will pose ideas that I would like you to comment on and go beyond your immediate experience to think about how it would work for others in the scheme.

1. Can you tell me about your background and involvement in exercise referral?
-What is your role now and what does it involve?

2. How do you think behaviour change fits in to your role/remit?
-What are some of the difficulties that can alter behaviour change use?

3. What, in your view, does behaviour change practice for staff involve?
-What does successful behaviour change practice look like to you?
-What are the expected benefits of using behaviour change practices?

4. I am curious about how things cause behaviour change (lack of) implementation. Thinking about your practice what do you think impacts your use of behaviour change?

-What did (element named) provide that can impact practice? Has the (element named) changed the way you feel or think? Would this be the same for all staff? If not why not?

-Is there other circumstances where this would not be the case?

5. There are lots of ideas about how behaviour change implementation works and it is likely that it works differently, in different places, and for different people. One of the ideas is 'X' Has it worked like that for you?

-Can you give an example? Why and how does it work like this?

-Can you think of other circumstances where this may play out?

6. When (theory area) has been experienced in your practice, what has allowed this to happen and what affect did it have on staff? Why was this the case? Where their some staff who responded differently? Why do you think this was the case?

7. Thinking about some of the ideas we discussed, is there one area that you see as crucial without it nothing else would work for implementation of behaviour change?

8. Are there any other reasons why you think staff use behaviour change techniques that we haven't covered today?

9. If you could change something about the service/people/networks to make it work more effectively what would it be and why?

Appendix B

Initial Realist Statements, Survey Items and Judith Schoonenboom's Feedback

Programme theory 1 (one example)

If there is a person-centred climate (C) and the service provides behaviour change organisational support, then practitioner's motivation and capability (M) will increase leading to the implementation of behaviour change practices (O).

Alternative realist model statements

- Hypothesis 1- Organisational support has an influence only when it augments motivation/capability.
- Hypothesis 2- A person centred climate is the necessary condition to activate changes to motivation/ capability via organisational support.
- Hypothesis 3- Organisational support influences implementation unrelated to changes in motivation.
- Hypothesis 4- Motivation influences implementation unrelated to organisational support.

Survey items for respondents

- If organisational planning (e.g. behaviour change manuals, behaviour change protocols) does not increase my motivation, I will not implement behaviour change practices regardless of the amount of supportive planning that is present.
- If I am not expected, or personally committed, to use behaviour change practices, organisational planning (e.g. behaviour change manuals, behaviour change protocols) will not alter my motivation meaning I will not implement behaviour change practices.
- If I get organisational planning (e.g. behaviour change manuals, behaviour change protocols) then I will use behaviour change practices regardless of how it impacts my motivation.
- If I am motivated to, I will implement behaviour change practices, even if supportive organisational planning (e.g. behaviour change manuals, behaviour change protocols) is not present.
- If organisational support (e.g. training, mentoring) does not increase my capability, I will not implement behaviour change practices regardless of the amount of support that I receive.
- If I am not expected, or personally committed, to behaviour change practices organisational support (e.g. training, mentoring) will not alter my capability meaning I will not implement behaviour change practices.

- If I get organisational support (e.g. training, mentoring) then I will use behaviour change practices regardless of how it impacts my capability.
- If I am capable of behaviour change practices, I will implement behaviour change practices even if organisational support (e.g. training, mentoring) is not present.

Feedback

Hi John,

Many thanks for your draft statements and underpinning hypotheses. I tried to visualise “programme theory 1” and your “alternative realist model”, and came up with something like:

As far as I can see, the important differences are: according to your statements, a person centred climate moderates the effect of organizational support on motivation, which it does not do in the programme theory 1; and according to your statements, organizational support can have a direct effect on implementation, whereas its effect is always indirect in programme theory 1.

One of the biggest challenges in formulating the statements is to make them so easy and concrete, that respondents feel able to answer them. Therefore, I would try not include more than one (moderated or mediated) relation in one statement, and make them more concrete. For example “if my organization expects me to change my behavior, I feel motivated to do so”; or “if my organization expects me to change my behavior, I will do so, even if I do not feel motivated to do so”; “training new behaviors works for me only, if I have a say in what is learned and when”. These are just first drafts of example statements that I think will be easier for respondents. I wish you good luck with the further development of your statements.

Best wishes,
Judith

Appendix C

First Draft of the Realist Survey

The aim of this section is to propose ideas to a range of practitioners and understand how these ideas resonate with your experiences. Please state to what extent each statement applies to you. Please clarify each of your answers.

If organisational planning (e.g. behaviour change manuals, behaviour change protocols) does not increase my motivation, I will not implement behaviour change practices regardless of the amount of supportive planning that is present.

Please state to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I am not expected, or personally committed, to use behaviour change practices, organisational planning (e.g. behaviour change manuals, behaviour change protocols) will not alter my motivation meaning I will not implement behaviour change practices.

Please state to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I get organisational planning (e.g. behaviour change manuals, behaviour change protocols) then I will use behaviour change practices regardless of how it impacts my motivation.

Please state to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I am motivated to, I will implement behaviour change practices, even if organisational planning (e.g. behaviour change manuals, behaviour change protocols) is not present.

Please state to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If organisational support (e.g. training, mentoring) does not increase my capability, I will not implement behaviour change practices regardless of the amount of support that I receive.

Please state to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I am not expected, or personally committed, to behaviour change practices organisational support (e.g. training, mentoring) will not alter my capability meaning I will not implement behaviour change practices.

Please state to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I get organisational support (e.g. training, mentoring) then I will use behaviour change practices regardless of how it impacts my capability.

Please state to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I am capable of behaviour change practices, I will implement behaviour change practices even if organisational support (e.g. training, mentoring) is not present.

Please state to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If supportive leadership (e.g. role modelling, allocating time) does not increase my motivation, I will not implement behaviour change practices regardless of the level of supportive leadership I receive.

Please state to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I am not expected, or personally committed, to use behaviour change practices, supportive leadership (e.g. role modelling, allocating time) will not alter my motivation meaning I will not implement behaviour change practices.

Please state to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I get supportive leadership (e.g. role modelling, allocating time) then I will use behaviour change practices regardless of how it impacts my motivation.

Please rate to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I am motivated to, I will implement behaviour change practices, even if supportive leadership (e.g. role modelling, allocating time) is not present.

Please rate to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If integration with medical professionals (e.g. calls, emails, meetings) does not increase my motivation, I will not implement behaviour change practices regardless of the amount of level integration I have.

Please rate to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If there is no shared effort to support behaviour change in patients across professions, integration with medical professionals (e.g. calls, emails, meetings) will not alter my motivation meaning I will not implement behaviour change practices.

Please rate to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I have integration with medical professionals (e.g. calls, emails, meetings) then I will use behaviour change practices regardless of how it impacts my motivation.

Please rate to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

If I am motivated to, I will implement behaviour change practices, even if integration with medical professionals (e.g. calls, emails, meetings) is not present.

Please rate to what extent this applies to you

Not at all	Not really	Somewhat	Completely
Please clarify your answer explaining why you think this			

Appendix D

An Outline of the Five Vignettes and their Corresponding Psychosocial Impediments to Change

1. Clare is 35-year-old women who is unemployed and living with her long-term boyfriend. She is flexible about attending the scheme but has limited funds for physical activity and is nervous about going to new facilities. Her primary concern is depression, but she has a complex medical history including previous heart issues

which would limit her exercise. She has had several failed treatments meaning she is disillusioned and pessimistic about her health. She is withdrawn and has social phobias about groups and needs to build deep trusting relationships with health professionals. She relies on high levels of support to encourage her to act on lifestyle advice but when supported she is committed. She finds it hard to see how she can get out of this rut but is desperately looking for ways to relief her symptoms. She does, however, feel that if her mood were better, she would be able to cope with her physical problems and contribute to home activities. She wants to improve her relationship and re-connect with more of her friends which she thinks will occur if her mood improves.

Helen's concepts	<p>Dependence on HPs: Needs high level of support</p> <p>Experience of care to date: Long term problems, several failed interventions, have seen multiple services - frustrated, disillusioned</p> <p>Ease within a group: Social phobias or shyness about group settings</p> <p>Confidence in future health: Pessimistic about health deteriorating</p>
TTM	<p>Contemplation- consciousness raising, dramatic relief, self re-evaluation, environmental re-evaluation, self-liberation, decisional balance, self-efficacy</p>
TDF - BCTs	<p>BeliefCap- PS, instruction, demos, rehearsal, grades tasks, verbal persuasion about capability, focus of past success, self-talk. (social reward, reduce negative emotions, biofeedback, goal setting)</p> <p>BeliefCons- info on health consequences, salience of consequences, social and environmental consequences, anticipated regret, emotional consequences, pros & cons, comparative imaging of future outcomes, incentive, reward</p> <p>Low optimism- review outcome</p> <p>Social influences- social support, demos, social comparison, info on others approval, social reward (restructuring the social environment, monitoring of behaviour by others without feedback)</p> <p>Emotion- reduce negative emotions (reframing, body changes, info on emotional consequences, anticipated regret)</p> <p>Intentions- goal setting, info on health consequences, incentive (commitment, info on others approval, valued self-identify)</p>

2. Pete is a 40-year-old self-employed plumber who lives with his wife and three young children. Pete's has a high work ethic and is keen to maintain his ability to work long weeks. Pete's wife works full time, yet money can be tight at times. He is a 'do-it-yourself' person and has already started re-engaging with physical activity. He is happy to travel but struggles with time due to work and childcare issues. He admits that when he is stressed or tired, he has not been able to set a consistent routine. He easily falls into old habits when work is busy or when his family wants to do

something else. His primary concern is joint and mobility issues following a knee replacement. Pete wants clear and no-nonsense advice to improve his ability to work pain free and he is certain exercise could help him if he knew how to train in a way that did not worsen his injuries. He is frustrated as he used to be very active and play sports and he is keen to get back into a regular routine.

Helen's concepts	Willingness to self-manage: wants to try everything they can before surgery/medication Previous experiences of PA: used to do lots of exercise Dependence on HPs: Proactive and independent Confidence in future health: Positive aspirations for future Personal PA-related goals: clear about what they want to do
TTM	Preparation – SE/temptation combination, self-liberation, stimulus control, helping relationships, counter conditioning, self re-evaluation, decisional balance, self-efficacy
TDF - BCTs	Knowledge- Biofeedback, instruction, info about antecedents, info about health consequences, info about social and environmental consequences (feedback) Behavioural regulation-PS, self-monitoring, info about antecedents, behaviour substitution, reduce negative emotions, conserving mental resources (punishment, habit formation/reversal, self-monitoring of outcomes, contract, discrepancy, action planning, goal setting) Social influences- social support, demos, social comparison, info on others approval, social reward (restructuring the social environment, monitoring of behaviour by others without feedback) Emotion- reduce negative emotions (reframing, body changes, info on emotional consequences, anticipated regret) Intentions- goal setting, info on health consequences, incentive (commitment, info on others approval, valued self-identify)

3. Tasneem is a 60-year-old who has taken early retirement to care for her parents who are unwell. She lives with her husband and has two older children and five grandchildren. Her cultural background means there is an expectation for her to look after her family and she feels that her own time, and health, are not a priority. Tasneem is more comfortable in women only settings and rarely leaves her local neighbourhood. She has little time for her own health and self-care due to her family restraints and she does not see much value in physical activity. Her primary concern

is high blood pressure but Tasneem has also has anxiety issues. Although she has not considered a lifestyle change, she is open and very trusting of professional advice. She is happy to try exercise but is fearful of how it may worsen her health problems. She has only started to gather information on physical activity and how it might help and is lacking an understanding of what to do. She also has low confidence in her physical activity ability. Tasneem would like to lose weight and spend more time doing something positive for her health and meet new people whilst ensuring she can still look after her family.

Helen's concepts	Fear of exacerbation or injury: ok as long as controlled and comfortable Openness to lifestyle advice: trust HP advice on lifestyle Dependence on HPs: Needs high level of support Personal PA-related goals: not sure what PA they would/could do
TTM	Contemplation- consciousness raising, dramatic relief, self re-evaluation, environmental re-evaluation, self-liberation decisional balance, self-efficacy
TDF - BCTs	BeliefCap- PS, instruction, demos, rehearsal, grades tasks, verbal persuasion about capability, focus of past success, self-talk. (social reward, reduce negative emotions, biofeedback, goal setting) BeliefCons- info on health consequences, salience of consequences, social and environmental consequences, anticipated regret, emotional consequences, pros & cons, comparative imaging of future outcomes, incentive, reward Social influences/role & identity - social support, demos, social comparison, info on others approval, social reward (restructuring the social environment, monitoring of behaviour by others without feedback) Emotion- reduce negative emotions (reframing, body changes, info on emotional consequences, anticipated regret) Intentions- goal setting, info on health consequences, incentive (commitment, info on others approval, valued self-identify)

- Keira is a 52-year-old office worker who is divorced and lives alone. She is highly influenced by her friends and has a very busy personal life. She is very active on social media which is a big passion of hers. Although transport and money are not an issue, she hates exercise environments and has bad experiences with them in the past. She is intimidated by groups where she feels people are fitter than her. Her primary concern is weight management but she has also been recently diagnosed

with type II diabetes. She is convinced she is not built for exercise and really does not enjoy it. Her GP is always 'nagging' her to lose weight and stop smoking. She did attend Slimming World once but when her friend could not attend, she stopped going. She is convinced she has heard it all before and just wants a quick fix as diet and exercise do not work in her eyes. Keira wants to enjoy life and avoid additional medications and seeing the GP so much. She tends to lose focus easily and her commitment to her health has previously been poor as she saw no tangible results.

Helen's concepts	<p>Willingness to self-manage: looking for a quick fix</p> <p>Previous experiences of PA: has always hated it. Her GP is always telling her she needs to lose weight and stop smoking. She started going to Slimming World with a friend but then her friend couldn't go anymore and she got bored doing it on her own.</p> <p>Openness to lifestyle advice: perceive as nagging - heard it all before</p> <p>Engagement with idea of PA and health: Do not see the value or benefit of PA</p>
TTM	<p>Precontemplation- consciousness raising, dramatic relief, environmental re-evaluation, social-liberation, decisional balance, self-efficacy, self-re-evaluation</p>
TDF - BCTs	<p>BeliefCons- info on health consequences, salience of consequences, social and environmental consequences, anticipated regret, emotional consequences, pros & cons, comparative imaging of future outcomes, incentive, reward</p> <p>Social influences- social support, demos, social comparison, info on others approval, social reward (restructuring the social environment, monitoring of behaviour by others without feedback)</p> <p>Emotion- reduce negative emotions (reframing, body changes, info on emotional consequences, anticipated regret)</p> <p>BeliefCap- PS, instruction, demos, rehearsal, grades tasks, verbal persuasion about capability, focus of past success, self-talk. (social reward, reduce negative emotions, biofeedback, goal setting)</p> <p>Intentions- goal setting, info on health consequences, incentive (commitment, info on others approval, valued self-identify)</p>

- Bob is a 70-year-old who works part time as a driver. He lives with his wife and they are financially comfortable and time rich. He gets frustrated at the number of medical appointments he must attend as he is an independent man who likes to take control. His health and decreasing capability are also making him frustrated giving him a feeling of hopelessness. His primary concern is mild depression, but Bob also has COPD. Bob believes physical activity would be good for him but is terrified over

overdoing it and does not have a good understanding of exercise. Bob is worried he is falling apart and is lacking confidence about his future health. He thinks it is now or never to take control over his health. He is open to advice but has lost faith with the medical profession as they do not communicate with each other or him and his health is getting worse. His pain is increasing, and he has lost his get up and go due to fear, low mood, and worsening mobility. He is open to meeting new people but lacks confidence in his own physical ability to be join in.

Helen's concepts	<p>Fear of exacerbation or injury: terrified of movement and 'overdoing it'</p> <p>Experience of care to date: Long term problems, several failed interventions, have seen multiple services - frustrated, disillusioned</p> <p>Ease within a group: Comfortable and open-minded about group settings</p> <p>Confidence in future health: Pessimistic about health deteriorating</p> <p>Engagement with idea of PA and health: Believe that PA is clearly linked to health outcomes</p>
TTM	<p>Contemplation- consciousness raising, dramatic relief, self re-evaluation, environmental re-evaluation, self-liberation decisional balance, self-efficacy</p>
TDF -BCTs	<p>BeliefCap- problem solving, instruction, demos, rehearsal, grades tasks, verbal persuasion about capability, focus of past success, self-talk. (social reward, reduce negative emotions, biofeedback, goal setting)</p> <p>Knowledge- Biofeedback, instruction, info about antecedents, info about health consequences, info about social and environmental consequences (feedback)</p> <p>Low optimism- review outcome</p> <p>Emotion- reduce negative emotions (reframing, body changes, info on emotional consequences, anticipated regret)</p> <p>Intentions- goal setting, info on health consequences, incentive (commitment, info on others approval, valued self-identify)</p>

Appendix E

Refined Introductory Page of the Survey

Exercise referral aims to increase people's physical activity levels. The adoption of certain techniques by exercise referral practitioners is important. This survey wants to hear your views on what might support the adoption of behaviour change practices.

The below statements seek your opinion about specific ideas. Please read the statements below and identify how strongly each one applies to you. You will be presented with four options: not at all, not really, somewhat, completely. Please choose one option for each statement and then clarify your answer.

Please take some time to explain your thought processes for each statement. Some statements propose how certain things might influence your use of behaviour change practices. When we ask your opinion about motivation, we mean things that direct and drive behaviour (e.g. beliefs, habits, emotions, intentions, identity). When we say capability, it refers to a range of attributes (e.g. skills, knowledge, and memory).

Please take the time to explain how things have/would influence you. Use your own words and be as descriptive as you can. Please answer the below statements regarding your current, or recent, experience of working in exercise referral. If you do not have some of the elements in your work, please think how they would impact you.

Appendix F

Final Survey Participant Information Sheet



St Mary's
University
Twickenham
London



Behaviour change practices in exercise referral practitioners: surveying and testing implementation

What is the purpose?

Exercise Referral Schemes (ERSs) are used to increase the physical activity of inactive people with long term conditions. Typically the delivery is diverse, and evidence has been of poor quality. National guidelines recommend the use of behaviour change practices. We know that organisational and individual circumstances will influence how recommendations are implemented. The aim of this research is to understand how behaviour change practices are implemented.

Why me?

You have been invited to take part as you have a perspective on behaviour change practice. You can offer your ideas about how, why, and in which circumstances implementation is influenced. You are under no obligation to complete the survey or take part in follow up work.

What will happen to my information?

Procedures will be in place to maintain your confidentiality. Any information you provide will be made anonymous by removing labels (locations etc.). All data will be stored securely in password encrypted files. Any audio data will be destroyed once transcribed. The survey platform phonic.ai is being used for this project. No data will be sold for commercial use and their full security information can be found here <https://www.phonic.ai/privacy>. What will I be asked to do? The survey will ask you about your behaviour change practice. I would like to follow up your survey to discuss this topic in greater detail and observe you at work. For those who agree to a follow up, a group will be invited for future participation based on the survey answers. Any future research will be done through Microsoft teams. You can withdraw at any time during the research project. If, at a late date, you would like to withdraw please email me to remove your input. Once the data has been analysed you will be unable to remove your input.

What will happen to the results?

Results of the study may be published and presented at meetings or conferences. Direct quotes may be used in research papers/presentations to illustrate themes and every effort will be made to maintain your anonymity. You can request a copy of the presentations or journals that come from the work. What if I have any questions? If you have any questions about this project, either now or in the future, please feel free to contact the main researcher. Thank you for taking the time to read the information sheet. John Downey
jdowney@marjon.ac.uk

Appendix G

Final Realist Survey

1. Service level protocols

- a) I work in a service where **I have a framework for my behaviour change practice (e.g. manuals, procedures).**

- b) If I have a behaviour change framework **it is likely** I will use behaviour change practices.
- c) A behaviour change framework **must** improve my motivation (e.g. beliefs, habits, emotions, intentions, identity) if it is to influence my behaviour change practices.
- d) A behaviour change framework improves **something other than** my motivation triggering me to use behaviour change practice.
- e) **I work in** an environment where there is a commitment to support long term behaviour change.
- f) A behaviour change framework will help **only** when the environment (e.g. organisation expectations, staff commitment) is focused on long term behaviour change.
- g) **If I am motivated,** I will use behaviour change practices even if a behaviour change framework is absent.

2. Ongoing organisational support

- a) **I have** on-going support (e.g. training, mentoring) to help my behaviour change practices.
- b) If I have on-going support, **it is likely** I will use behaviour change practices.
- c) On-going support **must** increase my capability (e.g. skills, knowledge, memory) if it is to influence my behaviour change practice.
- d) On-going support improves **something other than** my capability triggering me to use behaviour change practices.
- e) On-going support will help my practice **only** when the environment (e.g. organisation expectations, staff commitment) is focused on long term behaviour change.
- f) **If I am capable,** I will use behaviour change practices even if on-going support is absent.

3. Supportive management

- a) **I have a supportive manager** (e.g. role model, allocation of time) that focuses on using behaviour change practices.
- b) If I have supportive management, **it is likely** I will use behaviour change practices.
- c) Supportive management **must** improve my motivation (e.g. beliefs, habits, emotions, intentions, identity) if it is to influence my behaviour change practice.

- d) Supportive management improves **something other than** my motivation triggering me to use behaviour change practices.
- e) Supportive management will help my practice **only** when the environment (e.g. organisation expectations, staff commitment) is focused on long term behaviour change.
- f) **If I am motivated**, I will use behaviour change practices even if supportive management is absent.

4. Relationships with medical professionals

- a) I work with a group of medical professionals within exercise referral **who believe in the shared goal of behaviour change**.
- b) **I have partnerships (e.g. calls, meetings, joint learning)** with medical professionals who refer to me.
- c) If I have partnerships, **it is likely** I will use behaviour change practices.
- d) Partnerships **must** improve my motivation (e.g. beliefs, habits, emotions, intentions, identity) if they are to influence my behaviour change practices.
- g) Partnerships improve **something other than** my motivation triggering me to use behaviour change practices.
- e) Partnerships are irrelevant to my behaviour change practices **unless** there is a shared effort that values behaviour change.
- f) **If I am motivated**, I will use behaviour change practices even if partnerships with medical professionals are absent.

Appendix H

Conceptualisation of Behaviour Change Practices in Lay Terms Provided the Survey

Behaviour change practice, in this research, refers to the use of behaviour change techniques, a person centred approach, and targeting personal barriers to change (e.g. stage of change, self-efficacy). A person centred approach means you work with people in an empowering and collaborative way using their own experiences and preferences to guide your practice. Please describe, from your experiences, what influences your use of behaviour change practices and why this is the case.

Appendix I

Snapshot of Coding the Vignettes Responses to Appropriate BCTs through the BCTTv1

I would want to give Clare a call after receiving her referral form - if all this information was available initially. I would want her to hear my voice to allow her to start to build an impression of me. I would ask if she had ever been to the leisure centre? find out her local knowledge of the area to allow her to gain a picture of the setting. I would invite her in to come for a 'chat' about the scheme and for her to have a look around the centre. I would offer for her to bring someone with her as this can sometimes be a nice support. I would offer to welcome her at reception and explain what she will see as she arrives and what the meeting will involve. I would also send through the information and questionnaires for the referral scheme. on the assessment day I would meet her at reception with a smile and as we walk around the centre I would be encouraging conversations with open questions - how did you get here today? which way did you come to the centre? when was the last time you travelled over this way? I would be watching how Clare moves - walking/ posture/ trouble with stairs etc while holding informative chit-chat. If the centre was particularly busy I would guide Clare away from these areas. I would acknowledge members of the public to reinforce the community feel to the centre. My aim to this point is to gather information, to build a rapport and to support Clare to feel more at ease in this situation. I would explain that we have a room where we can have a chat. This room is also where some of the exercise sessions take place. I would show/ explain the different types of sessions held and explain how even though some sessions are group based the instruction is tailored to the individual. I would use information from our phone conversation regarding activity history to help reduce her possible fears of starting an exercise programme. I would let her know that I appreciate what a huge step she has taken in being able to attend today and that she has already started on her journey by knowing that she would like to be more active but I would ask her why she would like this and what she feels that being more active will bring her. This way we can discuss the benefits of activity. (I have often found that people are fearful as they think we will be asking them to run a marathon but are often relieved when they see that building on their already established daily routine can be a great start) I would ask about her day to day routine - walking/housework/TV or time spent sitting/gardening/craft etc is there a way that we can introduce activity snacking in to her day? Is her boyfriend active? do they do things together? is he supportive etc. We would have a conversation regarding her goals I would encourage her to find a solution, I would positively reinforce all the good things she is doing for herself already and congratulate her on these. I would ask her to do a small activity task and ask her to let me know on a set day how she is getting on with that task. I would ask her if she would consider attending a session to go through some movements that she could do at home to help her achieve her goals. Due to Clare's anxiety I would want to make her feel relaxed. I would do this by gaining information through conversation rather than questioning. As she does not understand why people say that exercise will help, I would want to discuss this to find out how she has felt in the past when she has been active. I would want to reassure her to the level of intensity that she will be able to work at, and how this might feel also that she is able to take a break whenever she needs - all exercises can be done seated if needed. We would set a start date and I would offer support before during and after the scheme.



Appendix J

One-Way MANOVA Assumptions

Testing outliers through linear regression - maximum critical value for two dependant variable MANOVA =13.82

Variables	Mahalanobis distance
Behaviour change frameworks	8.132
Partnerships with medical professionals	8.132
Supportive leadership	8.132
On-going support	7.483
Organisational commitment to behaviour change	8.132
Medical professional commitment to the shared goal of behaviour change	8.132

Testing univariate normality ($p>0.05$)

Variables	Shapiro Wilks
BECCI	0.11
BCTTv1	0.42

Testing multivariate normality $p>0.05$ for each level of the independent level

Variables	Shapiro Wilks
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Access	BECCI	BCTTv1
Behaviour change frameworks	0.52	0.12
	0.15	0.04*
Partnerships with medical professionals	0.12	0.34
	0.10	0.50
Supportive leadership	0.32	0.38
	0.08	0.001*
On-going support	0.45	0.19
	0.26	0.08
Organisational commitment to behaviour change	0.28	0.27
	0.001*	0.12
Medical professional commitment to the shared goal of behaviour change	0.08	0.11
	0.16	0.04*

*Violates normality assumption

Testing multicollinearity and associated relations (range required 0.2-0.9)

Variables	Pearson's R
BECCI & BCTTv1	0.78

Testing the homogeneity of covariance

Variables	Box's M significance level (P>0.001)
Behaviour change frameworks	0.29
Partnerships with medical professionals	0.13
Supportive leadership	0.54
On-going support	0.28
Organisational commitment to behaviour change	0.15
Medical professional commitment to the shared goal of behaviour change	0.19