The Department of Nursing and Healthcare

Waterford Institute of Technology

Doctoral Thesis

TITLE:

Developing a physical activity programme for people with severe mental illness using an Experience-based Co-design approach

BY

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Abstract

The journey of recovery during severe mental illness (SMI) is enmeshed in a complex relationship with physical activity (PA) and sedentary behaviours (SB) that extends beyond symptoms amelioration. The current research project details an iterative (4 study) project framed within a Social Ecological Model, modifying and utilising a service development approach called Experience-based Co-design (EBCD) to develop a PA and SB programme for people with SMI, called the *Move with Recovery* programme which has been developed as a solution to challenges associated with PA implementation in mental health care.

In Study 1 an examination of PA, SB and key factors that influence PA behaviour was undertaken. Study 1 (A) used self-report examination of PA levels (brief item measure -3Q) and the strength of barriers to PA in key biopsychosocial and ecological domains (DPAQ) with (n=105) outpatients with SMI. The findings indicate that 72% of participants did not meet the PA guidelines. No differences were seen between demographic and clinical variable groups in relation to activity levels using PA guidelines. Participants that did not meet the PA guidelines reported stronger barriers to PA in the psycho-social domains *Beliefs in the consequences of physical activity* and *Motivation and goals* ($p = \leq 0.001$). In Study 1(B) an examination of PA and SB was carried out using accelerometery in a sub-sample of (n=17) outpatients. Participants spent 7.8 hours/day in SB. Additionally, 22% of valid wear time accounted for Light PA, 5% for Moderate PA, and 0.5% for Vigorous PA. Reflecting Study 1(A), this suggests low levels of structured PA among participants and a need for increased PA. These details lay the context for detailed informing of the MWRP.

Study 2 took a hermeneutic phenomenological approach to multi-stakeholder exploration of the experiences of PA in rehabilitation and recovery mental health services using interviews. Two salient themes: '*The challenge of being physically active in recovery'* and '*Physical activity enables recovery',* were identified across the diverse sample. This study is the first interpretivist phenomenologically informed multi-stakeholder inquiry of PA concepts for people in recovery from SMI. This study also directly informed Study 3 (co-design).

Study 3 describes the co-design stage of a modified EBCD approach. The EBCD approach is a participatory, patient centred approach for health service development that is grounded in phenomenological inquiry, which encapsulates the recovery zeitgeist. Here, EBCD has been modified to align with an implementation science framework to make it suitable for developing a PA and SB programme for people with SMI. The findings from Study 1 and Study 2 are integrated into the iterative EBCD project using narrative trigger films of service user's experience, providing influence to the multi-stakeholder co-design process. In this EBCD project, PA and SB priorities were identified and patient experiences were translated into Action points and co-designed into a 21 week PA programme prototype (*Move with Recovery).* This programme is co-deliverable, community-outreaching but with structures to support patients that relapse in their activity behaviour.

Statement of originality and ownership of work

Name: Evan Matthews

I declare that this thesis is submitted in partial fulfilment of the requirement for the degree of Doctor of Philosophy (PhD) and is entirely my own work except where otherwise accredited. It has not at any time either in whole or in part been submitted for any other educational award.

Signed:

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Dedication

This PhD thesis is dedicated to my beloved Dad,

Neville Allenby Matthews

Thank you for everything.

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Index of Acronyms/Abbreviations

A/C:	Approved Centre
AVFC:	A Vision for Change document
BPD:	Bipolar Disorder
CI:	Confidence Interval
CPM:	Counts Per Minute
CRF:	Cardio- Respiratory Fitness
DPAQ:	Determinants of Physical Activity Questionnaire
EBCD:	Experience-Based Co-Design
EPA:	European Psychiatric Association
HSE:	The Health Service Executive
IPAQ:	International Physical Activity Questionnaire
MES:	Motivation and Education Session (Within MWRP)
MDD:	Major Depressive Disorder
MH:	Mental Health
MHC:	Mental Health Commission
MHS:	Mental Health Service
MWRP:	Move With Recovery Programme
MVPA:	Moderate to Vigorous Physical Activity
NMPDU:	Nursing and Midwifery Planning and Development Unit
NPAG:	National Physical Activity Guidelines
OBM:	Objective Based Measures
OT:	Occupational Therapist
PA:	Physical Activity
PANSS:	Positive and Negative Syndrome Scale
PAR:	Participatory Action Research
PHE:	Public Health England
PHQ 9:	Patient Health Questionnaire 9
PRACTIS:	The Practical Planning for Implementation and Scale-up Model
PSW:	Peer Support Worker
RET:	Resistance Exercise Training

RCT:	Randomised Controlled Trial
RR:	Relative Risk
SB:	Sedentary Behaviour
SECH:	South-East Community Health
SD:	Standard Deviation
SMI:	Severe Mental Illness
SP:	Service Provider
SRQ:	Self -Report Questionnaire
SZ:	Schizophrenia/ Psychotic illness
SU:	Service User
TA:	Thematic analysis
TDF:	Theoretical Domains Framework

Chapter 1

1.0 Introduction

Mental disorders are a leading global contributor to years lived with disability and a public health priority for health services internationally (Ferrari et al., 2014; Whiteford, Ferrari, Degenhardt, Feigin, & Vos, 2015). Severe Mental Illness (SMI) is any mental, behavioural or emotional disorder with consequent functional impairment that substantially impacts on life activities, and is therefore a profound variation of mental disorder (NIMH, 2019). For the purpose of this research project, SMI refers to diagnoses of Schizophrenia (SZ), Bipolar disorder (BPD), and Major Depressive Disorder (MDD). In Ireland, Mental Health (MH) services are delivered to people with SMI across a number of different branches of treatment (See Appendix 2 for diagram on structure of MH services in Ireland). Rehabilitation and recovery MH services provide outpatient care for people that have complex needs associated with an enduring SMI diagnosis, making them a particularly vulnerable population group considered not suitable for general adult community MH care (Department of Health and Children, 2006; Lavelle et al., 2007).

People with SMI experience a disproportionately high risk of early mortality and physical comorbidity as a result of a number of behavioural and lifestyle related practices which are more prevalent in this population group. Practices such as taking psychotropic medication, high rates of smoking, poor dietary practices, low levels of Physical Activity (PA) and high rates of Sedentary Behaviour (SB) are all implicated in the high rate of physical cardiometabolic comorbidity among people with diagnoses of SMI (Correll et al., 2015; Vancampfort, Stubbs, Mitchell, et al., 2015; Stubbs et al., 2015; Vancampfort, Sienaert, Wyckaert, et al., 2016).

People with SMI are more sedentary and less active when compared to general populations and consistently fall far short of PA guidelines for health (Stubbs, Williams, Gaughran, & Craig, 2016; Vancampfort et al., 2017). Additionally, there appears little or no literature with respect to PA levels or SB of populations with SMI in Ireland. Addressing low levels of PA and prolonged SB for this population is thought to have a multi-therapeutic benefit and thus, a role in care for people with SMI (Czosnek et al., 2018). Increasing PA and reducing levels of SB has been shown to be an acceptable, low risk and relatively low cost therapeutic intervention across transdiagnostic SMI populations (Vancampfort, Stubbs, Ward, et al., 2015; Carneiro et al., 2017; Czosnek et al., 2018). Such important therapeutic effects include reducing certain psychiatric symptoms across a number of diagnostic groupings (Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014; Stubbs et al., 2018; Vancampfort, Probst, Knapen, Carraro, & De Hert, 2012).This refers to one conceptual understanding of recovery, referred to as clinical recovery. Physical activity interventions are also beneficial in their application to ameliorate cardiometabolic risk factors which are shown to be disproportionately prevalent among people with SMI (Stubbs et al., 2018).

Physical activity is described in some research as a meaningful resource to enhance another concept of recovery known as the journeyed recovery (Hargreaves, Lucock, & Rodriguez, 2017), which relates to the development of new meaning and a sense of purpose during mental illness (Higgins, 2008; Higgins & McBennett, 2007). In doing so, good evidence has emerged which has thus far shown a role for PA in facilitating the journeyed recovery by structuring daily routine and lifestyle for individuals with SMI (Hargreaves et al., 2017; Soundy et al., 2014). Furthermore, PA engagement appears to facilitate social interactions with Mental Health (MH) service providers and other users of MH services. With the multiple and varied benefits of increased PA and reduced SB in mind, there are questions surrounding the low levels of PA and high levels of SB that have been documented in populations with SMI. This has also brought concerted efforts within the literature to address this PA and SB deficiency for MH populations (Deenik et al., 2019). Research to date has highlighted a gap between effective PA intervention research and increased PA levels that are achieved through real world clinical intervention. This phenomena has been termed the ‘translational gap’ that exists between research and practice (Rebar & Taylor, 2017). This translational gap is the impetus for this research to explore new conceptual ways to develop PA for people with SMI that can overcome this challenge of implementation. In doing this, this research looks to wider approaches to MH service development generally for guidance on ways in which this translational gap may be overcome.

Irish MH services, similar to other international contexts, have recently undergone a reorientation in service delivery to a recovery model of care (Department of Health and Children, 2006; Health Service Executive, 2018; Higgins, 2008). Principles of patient-centred care, patient inclusion in decision making (expertise by experience) and multi-disciplinary working, are all key tenets which currently shape this reorientation of service delivery (Health Service Executive, 2018). It is argued that PA research tasked with overcoming the translational gap, should prioritise principles of recovery orientated care which shapes wider service delivery.

These key recovery principles are reflective of a burgeoning service development approach with roots in participatory action research called Experience-based Co-design (EBCD) (Bate & Robert, 2007; Robert, 2013). Traditional EBCD is a six-stage approach to service development that has a multidisciplinary and patient-centred approach at its heart. Experience-based Co-design reflects the recovery and patient inclusion model which is the zeitgeist of contemporary MH care, leading to a growth in the application of EBCD to develop aspects of MH services (Palmer et al., 2018). Experience-based Co-design explores service user experiences and incorporates service users as collaborators in the design and development of health services (Bate & Robert, 2007). Experience-based Co-design is an approach that makes service user’s experiences available to participants of the multi-stakeholder co-design process. By using narrative trigger films of service users as a catalyst during stages of facilitated collaboration, experience inspired improvement priorities and developments are identified, and a systemic and planned integration of developments is implemented (Donetto, Pierri, Tsianakas, & Robert, 2015).

Social Ecological Models (SEM) offer an adaptable and suitable theoretical framework for examining biopsychosocial and environmental factors that influence lifestyle behaviours such as PA (Sallis, Owen, & Fisher, 2008). This SEM framework has been applied with much success in SMI populations previously (Vancampfort, Knapen, et al., 2012; Vancampfort, Stubbs, et al., 2015). It seems likely that some of the challenges inherent with implementing PA and SB programmes among vulnerable people with SMI may be context specific. As an example, in some MH contexts, policy level factors are evidently scant. In Ireland, MH policy has neglected to prioritise PA and SB (Matthews, Cowman, & Denieffe, 2018), such factors are likely to impact on the experiences of people with SMI in engaging in PA. In addition to this, SEMs have also been used to develop guidance frameworks such as the PRACTIS framework, which are designed to help research bridge the translational gap in PA research generally (Koorts et al., 2018). Such frameworks provide the roadmap guidance for future programme development such as this, to structure the approach in a manner that will yield the best outcomes with respect to PA programmes within services.

Broadly speaking, this research project applies the use of EBCD to develop a PA and SB programme for existing recovery orientated MH services where PA is not readily integrated into usual care for people with SMI. In addition, this project outlines the modification and application of EBCD to develop a PA programme that can be used in existing recovery focused MH context. For instance modification to the EBCD process are carried out in this research to understand the PA and SB of the Irish SMI population in rehabilitation and recovery MH care (Carried out through Study 1 A and Study 1B), in addition to more in-depth phenomenologically informed inquiry into the multi-stakeholder experiences of PA and SB to enhance the understanding the factors that influence behaviour (Study 2). Following this, Study 3 will use a Co-design approach, drawing from the knowledge of Study 1 and Study 2 to direct the development of a PA and SB programme for rehabilitation and recovery MH care, called the MWRP. This research will also consider the use of EBCD as an approach that is reflective of best practice PA implementation and scale-up research, making recommendations for the future.

1.2 Preparatory work for project conception

The initial stage of this research involved planning and development of the research project. To effectively develop the project a number of key steps were undertaken in the conceptualising of the research aim, design, structure and methodology.

First, this research received funding from the Health Service Executive (HSE), Nursing and Midwifery Planning and Development Unit (NMPDU) in the South East of Ireland, with stipulations that the research project will make contributions to HSE mental health care practice. To meet this stipulation, the research was first conceptualised through a series of needs analysis meetings with key mental health services in the South-Eastern Community Health region (SECH). A needs analysis was conducted with the HSE Mental Health Services Executive for SECH in June 2015. This involved a meeting in St. Canice's Hospital, Kilkenny (SECH) where the researcher delivered a brief presentation to the Mental Health Executive Team to pitch a proposed research project based on understanding from reading the literature and round table research team meetings. The key recommendation from this process included:

- 'Rehabilitation and recovery' mental health service users (with SMI) are most in need of integrated physical activity (PA) provision. 'Rehabilitation and recovery' service users make up a specific branch of mental health service users in Ireland with diverse and complex care needs (Lavelle *et al.*, 2007). (See Appendix 2 for diagram of branches of MH treatment in Ireland).
- PA programme development should be the salient project aim.
- PA programme should align with the recovery approach to care.
- Rehabilitation and recovery MH services would seek to facilitate data collection.
- The SECH recovery college should be a partner in project.

Following the needs analysis, a broad aim was identified by the researcher and supervisors, and a broad search of the literature was carried out by the researcher to consider emergent approaches to programme design and development within the health services field. The researcher (s) met with the South-East Mental Health Executive Management (HSE) in June 2015. This consultation yielded a number of outcomes specific to Study 1, shown below:

1. Rehabilitation mental health services (Outpatient service user with SMI) were particularly vulnerable to physical health comorbidity and hard to engage in PA and should therefore take the focus of future research.
2. It was agreed that research must be undertaken to ascertain PA levels/ SB of rehabilitation MH service users before undertaking developing a PA programme to reflect the gap that had been identified by the researcher.
3. Research should be undertaken that examines the influencing factors on PA of Rehabilitation MH service users to understand the needs of active and inactive persons in the particular service, again reflecting a gap in relevant literature.

Following this meeting, broad considerations of the EBCD approach were undertaken in consultation with the literature, a research team meeting was conducted to brainstorm its alignment with the research aim and any expected modifications required. Expert consultation was then sought through a meeting with Prof Glen Robert (Health Care and Innovation, Kings College London) and a modified EBCD approach prototype was consequentially developed. This prototype was brought to follow-up feedback meetings with (HSE) rehabilitation mental health teams across SECH region (Waterford, Wexford, South Tipperary, Carlow, and Kilkenny). Following this, the EBCD prototype was summarised for peer-review publication to ensure methods were theoretically informed (Matthews, Cowman, & Denieffe, 2018). Finally, the researcher (EM) attended intensive EBCD delivery training in 2017 with the Point of Care Foundation.

1.3 Research aim

The research project has an overarching aim to utilise a modified Experienced-based Co-design approach to develop a PA and SB programme that can be used within existing recovery focused MH services to provide and support appropriate and sustainable PA for people with SMI. In order to deliver on the overarching aim, three main research studies, each with individual objectives contributing to the overall research project aim, were carried out as part of the modified process, responding to gaps in the knowledge with respect to co-designed PA and SB resources for MH.

Study 1 (A)

The objectives of Study 1(A) were as follows:

(i) To quantitatively examine PA levels among people with SMI in rehabilitation and recovery MH care using self-report measurement.
(ii) To quantitatively examine key influences of PA behaviour change among people with SMI in rehabilitation and recovery MH services.
(iii) To provide contextual information for Study 3.

Study 1 (B)

The objectives of Study 1(B) were as follows:

(i) To quantitatively examine PA levels and SB of people with SMI in rehabilitation and recovery MH care using objective based measures.
(ii) To provide contextual information for Study 3.

Study 2

The objectives of Study 2 were as follows:

- **(i)** To carry out interpretivist phenomenological multi-stakeholder exploration of the experiences of PA in rehabilitation MH services.
- **(ii)** To generate ‘Touch points’, which are key experience shaping moments of an experience that can be used during Study 3 to help inform the co-design process of this study.

Study 3

The objectives of Study 3 were as follows:

- **(i)** To facilitate iterative multi-stakeholder co-design sessions, engaging participants to develop a physical activity and sedentary behaviour resource that can be used within existing MH services.
- **(ii)** To carry out an evaluation of the modified EBCD process.

1.4 Overview of thesis organisation

Chapter 2: A critical review of the literature

The title of this doctoral thesis ‘Developing the Move with recovery programme using a modified Experience-based Co-design approach’ provides the reader with an indication of the broad research area that is to be examined in this work. In Chapter 2, a review of the literature using critical review methods outlined in Grant & Booth (2009) is presented. This review highlights the role of exercise, physical activity, and sedentary behaviour for people with severe mental illness, with the intention of identifying gaps in the evidence base from which this current research is positioned. This chapter will also introduce the Experience-based Co-design (EBCD) approach, its origins, and its relevance within the context of developing MH services and the burgeoning patient-inclusion zeitgeist.

Chapter 2 has been divided into three sections which are broadly separate in the literature but are linked through the common thread of a rationale for addressing PA and SB within recovery-focused MH services. **Section 1:** provides an examination of literature into PA and SB in the context of clinical recovery. **Section 2:** provides an examination of quantitative literature and up-to-date review of qualitative literature using systematic approaches (Liberati et al., 2009) to investigate the factors that influence PA for people with SMI. **Section 3:** examines the paradigmatic shift of MH care and positions PA and SB within this recovery-focused service position. In addition to this, Section 3 introduces the EBCD, its theoretical and philosophical origins, and posits a rationale for the use of this service development approach for developing PA and SB programmes in MH settings.

Chapter 3:

While this research project may appear to have multiple studies of differing objectives and methods, these studies are in fact united under one central aim to this research project, shown in Section 1.3. On account of this, the methodology within each of the three main research studies of this doctoral theses are inherently linked as part of a broad EBCD approach taken with this research. In Chapter 3, the overarching methodological approach is elucidated for the reader to see how each study fundamentally links as part of the wider research project.

Chapter 4

Chapter 4 has within it an introduction that provides an overview for research across the two linked studies. Subsequently Study 1 (A) and Study 1 (B) each have individual Methods, Results and Discussion sections. Chapter 4 provides the descriptive detail that is missing in relation to literature on the PA levels and SB of outpatients with SMI in rehabilitation and recovery MH services in Ireland. In addition, this chapter gives a broad examination of the influences on PA behaviour, which are then explored further in follow-on chapters.

Chapter 5

Study 2 is shown as a stand-alone Introduction, Methods, Results, and Discussion of a multi-stakeholder exploration of the experiences of PA and SB in rehabilitation and recovery MH services. This study provides interviews of key stakeholders on which ‘experiences’ of the modified EBCD are largely accessed.

Chapter 6

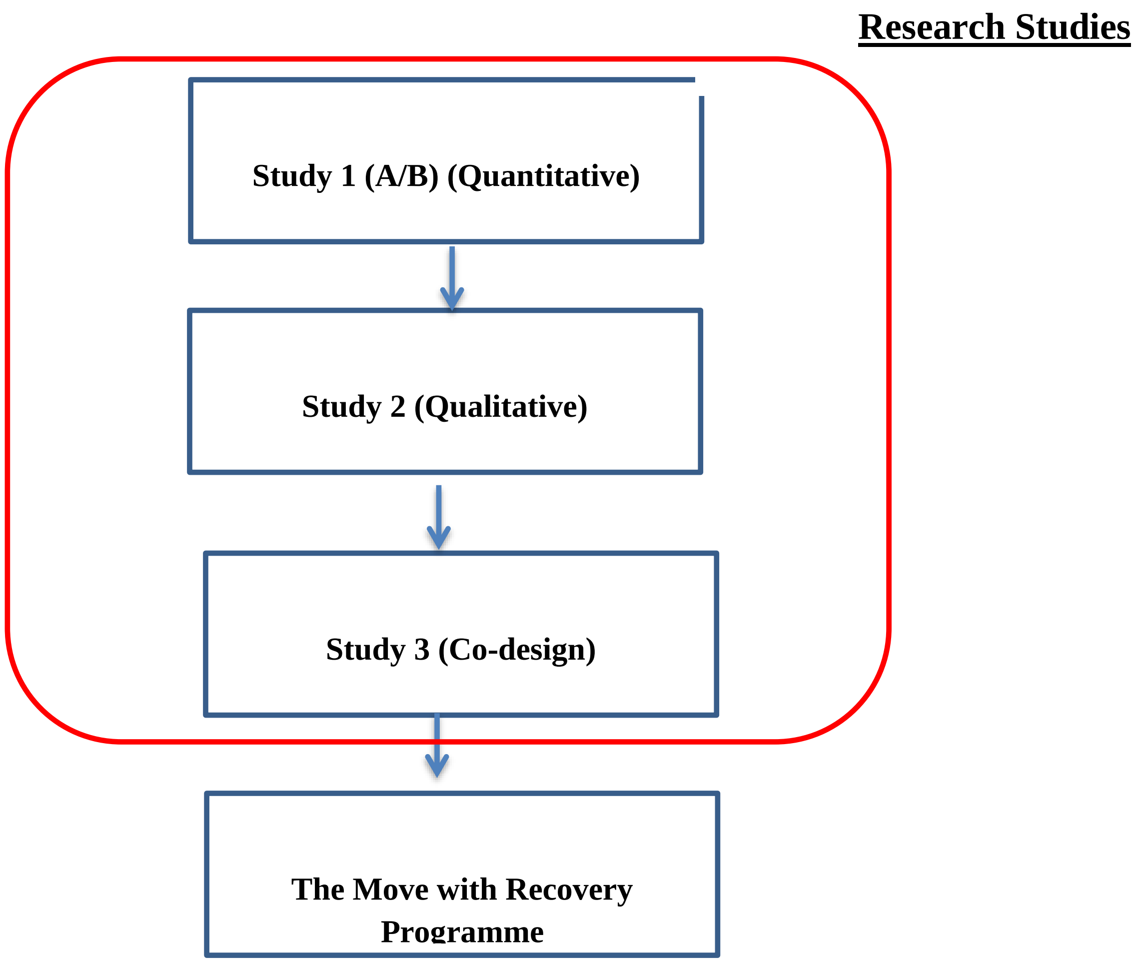
This chapter provides a detailed explanation of the co-design component of the EBCD approach to develop a PA and SB resource for rehabilitation focused MH services called the *Move with Recovery Programme.* In addition to the above, Chapter 6 details the methods, process and outcomes of co-design work and the methods, processes, and outcomes from the co-design evaluation.

Chapter 7

This chapter provides an overall thesis discussion, taking into account key findings from all chapters where primary research has been conducted, and discusses this in the context of the existing literature in this area. In addition to this, Chapter 7 makes key recommendations for enhancing the future in the areas of research, practice, and education.

The above paragraphs show that across seven main chapters of this doctoral thesis, there are three distinct primary research studies. While studies 1 and 2 could be viewed as stand-alone research studies, these studies make-up a much larger integrated and modified EBCD research study. A visual diagram of these individual studies which provides details of where these studies fit within this larger EBCD research project is shown below in Figure 1-1.

Figure 1-1 Overview of research studies within research project



1.5 Chapter summary

Chapter 1 has introduced the conception of this research project, the project aims, structure and a broad overview of the layout of this doctoral thesis. In this regard, this research is presented as a modified EBCD approach that is made up of 3 primary interlinked research studies. This chapter also introduces the reader to the MH service practice gap in which this research project has been conceived: that is, MH service users appear to have low levels of PA and high levels of SB which increases the risk of exacerbated poor mental and physical health for this population. To address this, this research puts forward a novel service user inclusive approach to service development, 'EBCD', which is being used here to develop a PA and SB resource in a manner which addresses the shortcomings of existing PA intervention research with respect to a robust upholding of recovery principles such as multidisciplinary working and service user inclusion throughout the design and implementation process.

Chapter 2 provides a more detailed background to the research project through a review of the literature.

Chapter 2

Developing the *Move with recovery programme* using a modified Experience-based Co-design approach: A critical review of the literature

Chapter 2: Critical review of the literature

2.0 Section introduction

This critical review was carried out with a number of key aims that are specific to the approach and content. First, this review aims to give a brief overview of the role that PA, SB and exercise have in relation to health and mental health (MH) in recovery for people with SMI (e.g. SZ, BPD, and MDD). Second, this critical review brings together and analyses the relevant literature which supports the use of Experience-based Co-design for developing a PA and SB programme for people with SMI in rehabilitation and recovery MH care. To achieve this, this review has been divided into sections. Section 1 of this review demonstrates the effect PA and SB have on the physical and MH of people with SMI. Section 2 outlines the quantitative and the qualitative literature on the factors that influence PA and SB of people with SMI. Lastly, section 3 details the literature on EBCD, and provides justification for its modification to meet the aims of this research project.

2.1 Critical review strategy

A critical review of the literature was undertaken to inform the reader across a range of research and supporting literature that sits within a number of different disciplines and contexts. This literature supports the work of this doctoral thesis by contributing a novel research and service development approach to addressing PA and SB in rehabilitation and recovery mental health services. A critical review mandates the author to extend their research methods beyond mere literature description, instead offering the reader a level of analysis, conceptual innovation, and in some instances, synthesis of research material in order to meet the specific aims and objectives of the research project (Grant & Booth, 2009). Critical reviews typically generate a hypothesis or model, as opposed to an answer. Critical reviews offer value in their ability to identify strengths and weaknesses of previous research approaches and may harmonise competing concepts or schools of thought allowing for conceptual development and prototyping of research concepts

(Grant & Booth, 2009). The specific search terms employed in the critical review are detailed in Appendix 5. Boolean operators were used to focus each relevant search.

Section 1: Physical activity as a therapeutic resource for severe mental illness

2.2 Severe mental illness and mortality

Much of the literature relating to PA and SMI specifically focuses on severe and enduring diagnoses of schizophrenia and psychotic type disorders, bipolar disorders, and major depression. Persons with such SMI diagnoses experience a disproportionate mortality gap, equating to an excess of 10 years of life lost (Walker, McGee, & Druss, 2015), and in some incidences, up to 20 years life lost when compared to the general population (Thornicroft, 2011). Worryingly, mortality rates among populations with SMI are showing no sign of abating, irrespective of life-expectancy improvements among the general population (Laursen, Nordentoft, & Mortensen, 2014). Some diagnoses, such as schizophrenia and psychotic type disorders appear to have deteriorating trends in life expectancy in recent times (Nielsen, Uggerby, Jensen, & McGrath, 2013). In Ireland, there is no definitive research or data to exemplify a national burden of early mortality for people with SMI (Nash et al., 2015). However, UK data which is arguably comparable in many respects, indicates that persons with all diagnoses of SMI accessing services have a reduced life expectancy of between 11.8 years in females and 12.9 among males (Chang et al., 2011). Self-injury and self-harm remain a concerning factor in the growing early mortality rate for this population. However, the leading risk factor appears to be cardiometabolic related comorbidity which is contributes roughly 70% to the early mortality of people with SMI like schizophrenia (Correll et al., 2017; Nielsen et al., 2013). This worsening early mortality trend, has been dubbed as a scandal of our time, in light of the inherent preventability and management of the offending cardiometabolic health issues (Thornicroft, 2011).

2.2.1 Physical comorbidity

Mental health services in Ireland have followed international counterparts in re-orientating service delivery towards a recovery approach in service provision

(Department of Health, 2001; Department of Health and Children, 2006). In doing so, MH services in Ireland are compelled to give attention to physical health needs of service users (discussed in detail in subsequent sections). The high rate of early mortality that is found to occur in SMI populations is largely brought about by a disproportionate occurrence of somatic co-morbidity, hereafter referred to as co-morbidity (De Hert et al., 2011; Nash et al., 2015). A number of comprehensive meta-analyses and systematic reviews carried out in recent years have attempted to examine the extent of the comorbidity burden in SMI populations (Correll et al., 2017; De Hert et al., 2011; Nash et al., 2015; Stubbs, Vancampfort, De Hert, & Mitchell, 2015). These papers show that high levels of comorbidity for this cohort are the leading contributing factor in the high rate of early mortality in SMI populations. A 2017 meta-analysis incorporating over 3,000,000 data points including transdiagnostic persons with SMI, shows that 10% of people with SMI have comorbid cardiovascular disease; this increased to 12% in analysis that looked specifically at affective disorders (Correll et al., 2017). This landmark review also highlighted concerning data around cardiovascular related mortality, reporting that persons with SMI are 85% more likely to die from such cardiovascular related comorbidity compared to general populations.

The review by Correll and colleagues provides robust evidence that new psychotropic medications, particularly second-generation antipsychotics are implicated in a considerable proportion of the comorbidity burden. However, their effectiveness in managing psychiatric symptoms for patients undoubtedly means an upward trajectory of prescribing (Correll et al., 2015; Correll et al., 2017). This treatment paradox brings a concentrated focus on what can be done to ameliorate this burden of chronic illness for people with SMI (Vancampfort et al., 2019).

2.2.2 Cardiometabolic risk

Another way of illustrating the cardiometabolic comorbidity burden that is disproportionately prevalent in SMI populations, is through research that demonstrates the prevalence of metabolic syndrome. Metabolic syndrome is characterised by a clustering of co-occurring cardiometabolic biomarkers of disease, such as hypercholesterolemia, decreased insulin sensitivity and typically central obesity. Metabolic syndrome increases the relative risk of cardiovascular disease occurring by between 1.54 and 1.60 among the general population (Galassi, Reynolds, & He, 2006). A 2015 meta-analysis shows metabolic syndrome is estimated to be prevalent in 33% of persons with SMI, including schizophrenia (SZ) and psychotic disorders and mood disorders. In studies where incidence of metabolic syndrome in SMI populations was compared against incidence in matched healthy controls, a significant increased relative risk (RR) over the general population is shown at 1.58; indicating a health inequity between those with SMI and those without (Vancampfort et al., 2015). Similar to what was shown with cardiovascular comorbidities, a study by Stubbs and colleagues in 2015 show similar unfavourable patterns in glucose homeostasis for persons with SMI when compared to the general population. Type 2 diabetes, which is a chronic metabolic condition that vastly increases risk of cardiovascular-related death (Shah et al., 2015), is prevalent in over 10% of people with SZ, thereby increasing the risk of developing diabetes by over 80% in that of the general population (Stubbs et al., 2015).

Unfortunately, there is a scarcity of available literature with regard to comorbidity in persons with SMI living in Ireland as shown by a recent systematic review (Nash et al., 2015). However, one study carried out in Dublin with 112 people with SMI aligns to other international research, showing a greater than 20% incidence of physical comorbidity such as diabetes, cardiovascular disease or cerebrovascular disease (Behan et al., 2008). Alarmingly, the presence of at least one or more cardiometabolic risk factors for comorbidity were present in over 90% of the sample, with hypercholesterolemia, abnormal glucose levels and central obesity named as prominent risk factors (Behan et al., 2008). Similar findings are shown in another Irish study with a sample of one hundred participants (Gubbins, Lally, & McDonald, 2012). Here anthropometric measurements of community dwelling participants showed a 55% prevalence of metabolic syndrome and an 88% prevalence of obesity among the sample with SMI (Gubbins et al., 2012).

With the exception of these two studies, it is apparent that there is an absence of comprehensive population data from an Irish perspective; it therefore seems useful to look to comorbidity literature from the UK. A large-scale cohort study that was inclusive of 46,000 people with varying diagnoses of SMI shows that there is a three-fold increase in coronary heart disease-related mortality for people with SMI comparative to general population (Osborn et al., 2007). In addition to this, a recent study prompted by Public Health England (PHE) revealed sobering findings on the state of health among people with SMI in the UK. The findings, which compared the rates of physical illness of general practice patients against those with SMI, showed that rates of obesity were 1.8 time greater, diabetes (1.9 times greater), COPD (2.1 times greater), coronary heart disease (1.2 times greater) and stroke (1.6 times greater) among people with SMI compared to patients without (PHE, 2018).

2.2.3 Risk factors for comorbidity and SMI

The disproportionate levels of comorbidity, and consequent mortality in SMI populations is a multifaceted and complex epidemiological phenomena (Connolly & Kelly, 2005; Mitchell et al., 2013). That being said, there is good evidence that a number of lifestyle and behavioural factors that are typically characteristic of SMI have a negative effect on somatic health. As already mentioned, strong evidence shows correlations between weight gain and antipsychotic usage (Bak, Fransen, Janssen, Van Os, & Drukker, 2014), particularly among second-generation antipsychotic medications, such as olanzapine (Lieberman et al., 2005). There is also evidence that indicates antipsychotic medication can increase the risk of diabetes mellitus and to a lesser extent, hypertension (Correll et al., 2015; Correll et al., 2017). People with SMI have high rates of nicotine smoking compared to people in the general population. For instance, UK estimates show smoking prevalence is as high as 70% among MH service users, compared to 25% usage in general population comparisons (Jochelson & Majrowski, 2006). In addition to these factors, are low levels of PA and high rates of SB among this population (Schuch et al., 2017; Vancampfort et al., 2017; Vancampfort, Firth, Schuch, Rosenbaum, De Hert, et al., 2016). This area of research has gathered substantial momentum in the last decade (Pratt et al., 2016; Richardson et al., 2005; Vancampfort, Stubbs, Ward, Teasdale, & Rosenbaum, 2015). Accordingly, comprehensive lifestyle interventions with core integrated exercise and PA components appear capable of attenuating much of the chronic physical health issues that are disproportionately occurring in SMI populations as evident from international research (Curtis et al., 2016).

2.3 Physical activity and sedentary behaviour

Physical activity is an umbrella term for all bodily movement that increases energy expenditure significantly beyond that of rest. Exercise refers to structured/planned PA and/or sport (ACSM, 2014). As such, PA will be the overriding terminology used throughout this doctoral thesis to refer to both structured and un-structured PA. Physical activity can be subdivided into different intensity levels. For example, light-intensity activity accounts for activities preformed between >1.5 MET and <3 METs (Metabolic Equivalent Tasks). Physical inactivity, or rather, sedentary behaviour (SB) is classified as an energy expenditure of ≤1.5 METs reached while sitting or in a reclined state such as sleep (Tremblay et al., 2017). Moderate to vigorous PA would be achieved in a range of 3-8 METs (Owen, Healy, Matthews, & Dunstan, 2010). It is therefore separate from a mere sub-threshold level against PA guidelines; this is termed inactivity (Tremblay et al., 2017).

2.3.1 Physical activity

To maintain general population health, Irish National Physical Activity Guidelines (NPAG) recommend a minimum of 30 minutes/ day moderate PA or 75 minutes/ day vigorous PA on ≥5 days a week or 150 minutes moderate-intensity PA/week (Department of Health, 2016; Garber et al., 2011). Whilst the health benefits of regular and sustained PA are largely appreciated, it appears that many developed countries report low levels of PA within general populations. In Ireland, data from the general population shows that 12.1% of the population are classed as completely sedentary (no participation in structured exercise or incidental PA), and only 32.6% of the population are meeting national physical activity guidelines, which shows a minor improvement with an increase of 2% on 2015 (Ipsos-MRBI, 2017).

The recommended guidelines for people with SMI are largely similar to these NPAG already shown in the previous paragraph. A recent position statement from the European Psychiatric Association (EPA) supported by large meta-research has advocated that clinicians promote 150 minutes of aerobic exercise at moderate to vigorous intensity every week for people with schizophrenia (SZ) (Stubbs et al., 2018). For depression, it is recommended that individuals should undertake 2-3 sessions per week of 45-60 minutes aerobic/resistance exercise at a moderate intensity. Recommendations on PA for bipolar disorders (BPDs) are likely to reflect the above, however, the evidence to support stand-alone guidance does not yet exist (Stubbs et al., 2018). Whilst comparison of this population data against SMI population data would be too crude a comparison, there is existing meta-analyses that has carried out comparison PA levels research of people with SMI versus matched controls (Vancampfort et al, 2017). This is discussed below (Section 2.3.9).

2.3.2 Sedentary behaviour

Almost irrefutable evidence now exists which shows that people who do not engage in regular and sustained PA, but instead engage in prolonged periods of SB are at greater risk of ill-health. Physical inactivity is a major contributor to worldwide chronic non-communicable disease prevalence that consequentially contributes to over 9% of the worlds premature mortality (Lee et al., 2012). The separation between SB (≤ 1.5 METs - sitting or reclined) and inactivity (sub-threshold level of PA) (Tremblay, 2012; Tremblay et al., 2017), theoretically, means that a person could achieve the PA guidelines for health, but at the same time be otherwise engaged in frequent prolonged bouts of SB with undesirable metabolic effects, a phenomena sometimes referred to as ‘the active couch potato’ (Owen et al., 2010; Tremblay, Colley, Saunders, Healy, & Owen, 2010). The Irish

Sports Monitor references the term ‘sedentary’ to denote individuals who do not meet the PA guidelines NPAG (Ipsos-MRBI, 2017). However, in the context of classifying individuals as sedentary, this writing takes from the overarching consensus of terminology within the scientific literature, where failure to meet NPAG is termed inactivity. In this regard specificity is required in understanding terminology used in the literature. Sedentary is a distinct class of behaviour where energy expenditure is ≤1.5 METs in a sitting or reclining state (Tremblay et al., 2017). Convincing research shows that SB has distinct health implications that may occur independent of PA (Owen et al., 2010). Despite this however, debate regarding the safe and unsafe thresholds of SB and also, the challenges relating to SB measurement, means that there is no guidance on SB levels within national PA guidance as of the time of writing (Stamatakis et al., 2019). This illustrates that the importance of addressing SB as well as addressing low levels of PA. The importance of this point in relation to SMI populations will be further examined in Section in 2.3.10, where considerations for future research in this area is also discussed.

2.3.3 Measuring physical activity and sedentary behaviour

The epidemiological concept of measuring PA and SB is one that is fraught with challenges for a plethora of reasons such as instrument reliability, validity, ease of use for participant, and ease of use for the researcher. In addition to this, the more fundamental challenge of accurately capturing PA across frequency, intensity, duration and type, and SBs across number of bouts, interruptions, time and type all must be considered carefully (Dishman, Washburn, & Schoeller, 2001; Janz, 2006; Tremblay et al., 2010). The two main categories of measurement tools from which PA and SB may be captured are Self-Report Questionnaires (SRQ) and objective based measures (OBM); each come with their own merits and limitations.

Self-report questionnaires are typically less financially taxing to administer, have applicability of use for large samples and have minimal participant burden therefore proving useful for measuring PA at a population level. However, issues such as length of time for which recall is likely to be accurate, overestimation of activity, homogeneity of PA contexts for which questions may not specifically ask, are all potential limitations of SRQs observed in general population research (Dishman et al., 2001). Objective-Based Measures (OBM) on the other hand, such as accelerometers, which translate measured movement on orthogonal planes into energy expenditure readings, have been shown to have good validity, are not subject to participant recall bias and are applicable for measuring SB. However, such OBM are expensive to use and can be resource-demanding, which poses challenges for measuring larger research samples (Sylvia, Bernstein, Hubbard, Keating, & Ellen, 2014). Additionally, accelerometers, which are typically hip-worn devices, measures accelerations, and as such do not detect upper-body movements and exertions against resistance (Lee & Shiroma, 2014). While this is a methodological limitation within certain populations such as athletic populations, the converse of this is an accurate measurement tool in populations with the propensity for SB and where walking may be a favoured activity (Lee & Shiroma, 2014). Qualitative research among people with SMI and MH service providers indicates that walking is the most widely accepted and utilised PA within some clinical MH settings, indicating accelerometers may be a useful measurement tool in these populations (Browne, Mihas, & Penn, 2016).

2.3.4 Measuring activity in SMI populations: tool selection

A burgeoning research body looking to investigate the use of PA as a means to improve the health of people with SMI has led to the use of a variety of existing SRQs and OBM across the literature seeking to measure PA levels or SB of people with SMI (Soundy, Roskell, Stubbs, & Vancampfort, 2014). Soundy and colleagues highlight a vast disagreement among researchers with regard to the most effective measurement tool, particularly in relations to SRQs for measuring PA and SBs in SMI populations. Much of this debate centres on two key issues. These are; strong limitations within the research studies that have sought to validate existing SRQs in SMI populations (Soundy, Roskell, et al., 2014), and an apparent discrepancy between SRQs and OBM of PA in certain SMI populations within some of the prominent literature (Vancampfort, Firth, et al., 2016).

A large number of different SRQs have been used for measuring PA in people with SMI within studies across the relevant literature field. Among these are a number of SRQs that have been utilised and undergone specific validation work with SMI populations. These are; 7DayRecall (Soundy, Taylor, Faulkner, & Rowlands, 2007), CHAMPS Questionnaire (Dubbert, White, Grothe, O'Jile, & Kirchner, 2006), the Active Australia Survey (Fraser et al., 2015; Chapman et al., 2016), The Yale Physical Activity Scale (Lindamer et al., 2008), and the IPAQ (Faulkner, Cohn, & Remington, 2006; Northey & Barnett, 2012). Presently at the time of writing, a validation study for another, the Simple Physical Activity Questionnaire (SIMPAQ) is currently underway – at time of writing (Rosenbaum et al., 2019; Rosenbaum & Ward, 2016) for which the researcher (EM) is a contributing author.

Many of the SRQs that have previously been subject to validation study with SMI populations are also shown to have a number of limitations. The CHAMPS SRQ was reported to have usability limitations in the context of use for people with variants of cognitive impairment (Dubbert et al., 2006). The 7-DR was shown to have questionable validity which was heightened by the small sample size in the validation study (Soundy et al., 2007). The IPAQ was shown to have poor reliability with regard to PA measured at the moderate intensity in SMI populations (Faulkner et al., 2006). Additionally, the IPAQ, which is among the more widely used SRQs with SMI populations (Faulkner et al., 2006; Vancampfort, Probst, Knapen, Carraro, & De Hert, 2012), has been subject to scrutiny in the literature with regard to its application in clinical settings. For instance, an editorial published by some of the initial IPAQ collaborators has cautioned the scientific community about the lack of applicability of the IPAQ design, specifying that it was not intended to be sensitive to behaviours of specific clinical population groups (Bauman, Ainsworth, et al., 2009). More recently, the aforementioned narrative synthesis by Soundy, Roskell, *et al.* (2014) has made clear that existing validation studies of SRQs with SMI populations have been limited by inadequate sample sizes to appropriately advocate for any one particular SRQ to measure PA and SB in future research.

The second challenge relating to the use of SRQs in SMI populations pertains to apparent discrepancies between SRQ and OBM within existing research. For example, a meta-analysis that focused on BPD and PA found significantly greater pooled PA as measured by SRQs compared to OBM, suggesting that over-reporting may occur during the application of SRQs in some research on PA and SMI populations. The meta-analysis demonstrated a statistically significant difference in time of total PA between SRQ findings (315 mins/day) and OBM (179 mins/day) (Vancampfort, Firth, et al., 2016). It is important in this instance to note that there is a considerable dearth of primary research where PA is shown as a primary outcome measure among people with BPD (Melo, Daher, Albuquerque, & De Bruin, 2016). As a result, the meta-analysis by Vancampfort, Firth, *et al.* (2016) included just six studies and only 207 participants in their analysis. The included studies of this review all utilsed the IPAQ SRQ to measure PA levels of people with BPD. This review indicates that a positon of caution hangs over the use of SRQs within PA epidemiology and SMI popualtions. Importantly, it does not provide a coverall position to dismiss the use of SRQs in this context. Other research on PA levels and SMI diagnostic populations have shown discrepencies between SRQs and OBM in particular domains of PA. For instance, Schuch *et al.* (2017) shows over-estimation/over-reported PA from SRQ data in relation to higher intensity moderate to vigorous PA (MVPA) based on pooled OBM comparisons (Schuch et al., 2017).

Over-reporting of PA in research with SRQs is not a concept that is unique to populations with mental disorders. Instead, it seems characteristic of recall bias that is a largely accepted phenomena within PA epidemiology which must be weighed against the benefits of using SRQs (Dishman, Washburn and Schoeller, 2001; Hamer, Coombs and Stamatakis, 2014). The benefits of using SRQs, such as low participant burden and ease of large sample reach are widely reported (Dishman et al., 2001). Despite the findings of the two reviews discussed in the previous paragraph (Schuch et al., 2017; Vancampfort, Firth, et al., 2016), there is also a body of evidence, which shows only small discrepancies between SRQs and OBM in measuring total PA and SB as an outcome across SMI populations (Stubbs, Firth, et al., 2016). Such non-significant differences between SRQs and OBMs are shown in global transdiagnostic SMI meta-analyses of PA levels of people (n= >35,000) with SMI (Vancampfort, Firth, et al., 2017). However, it appears that this discrepancy may exist in the detection of PA at the vigorous intensity, where SRQs may be prone to over-estimation of PA levels (2.4 mins/day vs. 7.2 mins/day, 95% CI: 0.0-48, p= 0.04).

Based largely on the narrative synthesis by Soundy, Roskell, *et al.* (2014) and resarch from Vancampfort, Firth, *et al.* (2016), the literature narrative points to research in the direction of OBM in the context of PA, and SB in particular, for research with SMI populations. However, similarly to SRQs, these methods are not without limitation. For example, the synthesis of literature on PA measurement tools in SMI populations which advocates for greater use of OBM has shown variability in the type of OBM used in the literature. Included studies used Doubly Labelled Water, Accelerometers (RT3, ActiGraph, Computer Science Application), and SenseWear arm bands (Soundy, Roskell, et al., 2014). While accelerometers appear to be the prevailing method of OBM used in this field of research, the absence and variability of literature in this regard means that there is little consensus on appropriate devices, sampling frequency, wear-time, epochs, and cut points, which in turn may reduce the sensitivity of accelerometer devices in measuring PA between differing intensities (Kruisdijk et al., 2017). This variability is clearly seen within studies where different accelerometer types have been utilised. Careful consideration is needed with regard to choosing thresholds which will capture meaningful activity for this population. In the case of Kruisdijk and colleagues, this required the adoption of liberal cut points to detect small increases in PA.

While earlier studies with people with SZ utilised single axial accelerometery (Lindamer et al., 2008). More recent research with sixty persons with BPD has used accelerometer devices with a greater number of axis for measurement in their study of PA levels (Janney et al., 2014). Here, ActiGraph AM-7164 devices were utilised and epochs were set in accordance with (Freedson, Melanson, & Sirard, 1998) at which ≥1952 counts per minute represents the threshold for MVPA. Somewhat contrasting these methods, Jerome, Young, *et al.* (2009) used (Rowlands, Thomas, Eston, & Topping, 2004) cut points in their study of fifty five people with SMI that wore RT3 accelerometers for just over a four-day period. In applying Rowlands *et al.* (2004) >1316 counts per minute sufficiently indicates MVPA. Other studies using ActiGraph GT3X devices with a sample of n= >250 people with inpatients with SMI from the Netherlands applied the cut point of ≥2751 counts/min for MVPA (Kruisdijk et al., 2017). These three studies demonstrate that within primary research that is considered methodologically robust, there exists considerable variability and no clear direction between studies for using OBM. Considering the overall picture; it is arguable that the evidence provides no clear guidance regarding the selection of instrument measures for PA in SMI populations. The literature to date elucidates advantages and disadvantages for both OBM and SRQ, even in the presence of validation studies. Therefore, the considerable merit and disadvantages of each warrant consideration of the use of both where feasibly possible.

In looking to alternative options in PA epidemiology and measurement, brief item SRQs comprising of one, two or three questions have been developed with a view to maximising participant engagement by minimising participant burden, allowing for mass population level measurement and somewhat offering a return to the strength of SRQ instruments in PA epidemiology, that is to maximise data points within limited resources and causing minimal participant burden to increase participation (Warren et al., 2010). Brief item PA assessments may prove useful when attempting to ascertain large population compliance with PA guidelines (Milton, Bull, & Bauman, 2011). Research into the accuracy of brief item SRQs is lacking, with some evidence suggesting brief item SRQs may be inaccurate for detecting PA levels in highly active populations, which is likely to have limited generalisability (Murphy et al., 2017; Zwolinsky, McKenna, Pringle, Widdop, & Griffiths, 2015). On the other hand, research has also shown brief item SRQs to be reliable and valid in the general population when measured against the Global Physical Activity Questionnaire (Milton et al., 2011). Brief item SRQs which use two (2Q) and three item (3Q) measures were originally developed in Australia for routine clinical contexts. Concurrent and criterion validity testing in the general population of both 2Q and 3Q measures against the widely used Active Australia Questionnaire showed significant and positive correlations across moderate, vigorous and total PA (Smith, Marshall, & Huang, 2005).

In relation to classification of total PA guidelines, both measures (2Q and 3Q) compare reasonably well to the Active Australia Questionnaire. Both the 2Q and 3Q SRQs have shown fair to moderate correlations (r= 0.39 and r= 0.31 respectively) against OBMs (accelerometery) in previous research. The 3Q showed fair agreement with accelerometery in relation to classification of sufficient total PA; the 2Q did not (Smith, Marshall, & Huang, 2005). While the 3Q along with the 2Q both showed relative disagreement to accelerometery when capturing vigorous PA, both appear potentially useful SRQs for measuring SMI population PA levels against PA guidelines on account of their low participant burden. That said, the 3Q version is arguably superior over the 2Q in relation to accelerometery and Active Australia Questionnaire agreement based on general population research discussed above.

In relation to measuring SB in SMI populations, meta-analyses of studies have consistently shown large discrepancies between OBM and SRQ reporting, with much of the research pointing to underreported SBs using SRQs. For instance, research on those with experienced psychosis found an almost halving of pooled time in SB between SRQ (412 mins/day) relative to OBM (754 mins/day) (Stubbs, Williams, Gaughran, et al., 2016). Another study specifically focused on Major Depressive Disorder (MDD) showed a cumulative difference of two hours in time spent sitting between OBM and SRQ, again highlighting that SRQs may be subject to underreporting among SMI populations (Schuch et al., 2016). Another explanation for this differential regarding SB reporting in SMI populations could lie within the structure of specific SRQs that have been utilised in this context. For instance, a cross-sectional Australian study which measured PA levels and SB among N=21 people with SMI found an objectionable flaw in the application of IPAQ for SMI populations during SB measurement. The authors observed that IPAQ specifically focuses on sitting behaviours and therefore neglects the measurement of time spent napping and lying down (Northey & Barnett, 2012). This instrument design may present sensitivity challenges in the context of SMI populations. People with SMI are often characterised by unconventional sleeping patterns such as prolonged bouts of day-time sleepiness (Wulff, Gatti, Wettstein, & Foster, 2010). This postulated limitation of IPAQ poses concerns considering its proliferation of the literature on SB and people with SMI (Strassnig, Brar, & Ganguli, 2012; Vancampfort et al., 2014; Vancampfort, Probst, Knapen, Carraro, & De Hert, 2012). This challenge speaks to previous points about the application of IPAQ in clinical settings (Bauman et al., 2009).

Questions over the suitability of use among the widely used SRQs in relation to SMI populations is further reflected by recent efforts to develop a specific SRQ for this population which is also sensitive to measure SB (Rosenbaum & Ward, 2016). This work recognises that general population PA measurement tool may not transfer for use in MH populations with maintained validity. This work is indeed promising with respect to fast and reliable monitoring of PA levels and SB in the routine clinical setting, thus promoting intervention in the therapeutic and clinical setting. That said, SRQ measures are inherently limited on account of human recall bias, which will ultimately place some limitation on the findings of SRQs used in understanding the behaviours of a population. There is therefore justification for future research to not rely solely on SRQs in measuring PA and SB as outcomes in SMI populations (Northey & Barnett, 2012; Stubbs, Williams, et al., 2016). Where possible, it seems that a combination of both methods is an effective approach to PA and SB measurement where feasibly possible. This seems particularly relevant in the presence of a complete literature absence in the Irish setting.

2.3.5 Physical activity, sedentary behaviour, and mental ill health

The relationship between physical inactivity, SB and poor mental health is described as bi-directional. In this regard people with existing MH difficulty, particularly SMI, are typically inactive and largely sedentary (Stubbs, Williams, Gaughran, et al., 2016; Vancampfort et al., 2017). This will be discussed in greater detail in subsequent writing of the critical review (Section 2.3.7 & 2.3.8). In addition to this concept, epidemiological evidence suggests that low levels of PA increase the risk of future development of mental disorders. A cross-sectional study on a general population sample from the USA measured 5,200 men and 1,200 women's maximal Cardio Respiratory Fitness (CRF) as a proxy indicator of lifestyle PA, and found an inverse graded dose response relationship in relation to CRF between low, moderate and high fitness groups and symptoms of depression. These findings were mirrored where Self Report Questionnaires (SRQ) were used to measure PA levels (Galper, Trivedi, Barlow, Dunn, & Kampert, 2006). Other large sample research of 11,000 participants from the UK general population found strong associations with the presence of diagnosed depressive and anxiety disorders among people that were less physically active (Hamer, Coombs, & Stamatakis, 2014). More recently, the first meta-analysis was carried out using prospective cohort research including 266,939 people followed for 1,837,794 person-years. This study provided robust evidence that more active people in the general population had lower odds of developing clinical depression (adjusted odds ratio = 0.83, 95% CI = 0.79, 0.88, p= <0.001) (Schuch et al., 2018). These studies discussed here point to the existence of good evidence that consistent lifestyle PA is likely protective against the development of poor MH and possibly symptoms of certain mental disorders developing in the future.

As shown in Section 2.3.2, epidemiological evidence places the concept of SB as an independent risk factor in the development of a number of chronic illnesses (Lee et al., 2012). In the context of psychological distress among healthy populations, emergent evidence from two RCT studies have suggested that sedentary lifestyle may also have a role in future onset psychological distress, and potentially mental disorders (Edwards & Loprinzi, 2016; Endrighi, Steptoe, & Hamer, 2016). The research demonstrating deleterious effect on MH outcomes as a consequence of prolonged periods of SB is a somewhat newer field of research relative to PA. Looking to the two mentioned trials, the first study induced a one week sedentariness intervention (cessation of structured exercise and <5000 steps/daily –pedometer wear) on n=39 healthy participants that were previously meeting NPAG based on seven day wear of accelerometery. The findings following one week of induced inactivity (intervention) saw poorer subjective scores of depression (mean change of 3.28 – Patient Health Questionnaire 9 – PHQ9) and mood scores (mean change of 10.29 – Profile of Mood Scores) as a consequence of the intervention; findings which were not mirrored by control participants. To strengthen the cause and effect inferences made in this trial, persons in the sedentary intervention participated in a week 3 follow-up post resumption of their usual behaviour. Again, symptoms of depression were found to return to baseline after intervention cessation and a return to normal routine (Edwards & Loprinzi, 2016). Similarly, Endrighi *et al.* (2016) randomised forty three active (meeting NPAG) participants to a cross-over intervention (two weeks induced sedentariness replacing any structured and unstructured PA) and control (two weeks usual behaviour) where behaviours were measured with accelerometery. Inactivity was significantly associated with Profile of Mood States (POMS) negative mood scores, supporting the findings already shown in previous RCT by Edwards & Loprinzi, (2016). Other outcomes found in the cross-over trial by Endrighi *et al.* (2016), showed that negative moods demonstrated in the POMS scoring were associated with interleukin-6 markers of inflammation in blood plasma. This study, along with Edwards & Loprinzi (2016) provides RCT data with potential explanatory biomarkers for the deleterious effect SB aspects of MH independently.

Section 2.3.1 and 2.3.2 indicate that within the general population, PA and SB are distinct behaviours which, although related, also act independently on physical health. In this section 2.3.5, the deleterious MH effects of prolonged SB are also demonstrated with potential biological explanations drawn from trial research. As such, the literature discussed here points to the meaningfulness of both behaviours for providing therapeutic intervention for the SMI populations. It seems that both warrant consideration with respect to research methodology and outcome measures for future research that seeks to explore physical activity’s role in mental health therapy, in addition to research that seeks to increase PA levels of people with SMI in care. In this regard, issues such as measurement tool selection, activity level outcome measures are all pertinent issues to consider. The remaining sections of this critical review will examine the literature with respect to SMI and these two individual concepts of PA and SB.

2.3.6 The role of inactivity on comorbidity and SMI

Cross-sectional research from the general population shows that breaking up periods of sedentary time has a significant beneficial effect on blood triglycerides and blood glucose profiles (Healy et al., 2008). A study by Katzmarzyk *et al.* (2009) which took a prospective approach with 17,000 people in Canada found a positive association between daily sitting time (Almost none of the time, ¼ of the time, ½ of the time, ¾ of the time, almost all of the time) and cardiovascular disease related mortality and all causes mortality, with respective 54% increases of early mortality in the people that were most sedentary. Crucially however, prolonged sitting time was associated with mortality in a manner that was independent of any leisure time PA, indicating that prolonged SB is itself a stand-alone risk factor for early mortality (Katzmarzyk et al., 2009).

People with a SMI have greater risk of poor somatic health compared to the general population where lack of PA and increased SB appear implicated as a risk factor (De Hert et al., 2011; Vancampfort et al., 2015). A number of studies have demonstrated this link between low levels of PA, extended periods of SB and poorer cardiometabolic health specifically within populations that have a SMI diagnosis. For example, a cross-sectional study with a sample of n=76 people with SZ using the IPAQ to measure typical sitting time found that respondents that had sitting behaviours in excess of 10 hours/daily were also found to have significantly greater BMI, waist circumference and fasting blood glucose (Vancampfort, Probst, et al., 2012). These findings support later cross-sectional research with 39 people with BPD, which showed that increased sitting time was associated with higher doses of antipsychotic medication, lower cardiorespiratory fitness, and a higher number of risk factors for metabolic syndrome (Vancampfort, Sienaert, et al., 2016).

The two studies outlined in the previous paragraph suggest that sitting appears strongly implicated in physical comorbidity and SMI. Additional cross-sectional research with 199 persons with a diagnosis of SZ found that sedentary participants had significantly (*p*=

<0.05) poorer readings of blood glucose (fasting) relative to persons with more favourable sedentary profiles (105.2 vs 96.3 mg/dl) (Stubbs, Chen, Chung, & Ku, 2017). Multivariate analyses also carried on HBA1C data reported in Stubbs and colleagues found that such markers of cardiometabolic health were subsequently attenuated in persons that had increased engagement in PA. These findings support assertions made earlier within general population literature that PA and SB should be examined independently, as they likely serve as distinct health behaviours within SMI populations. Combined, these studies indicate that SB is likely to act independently on the cardiometabolic health of people with SMI. However, the cross-sectional design of each of these research studies limits the readers in making causal inferences around this risk factor.

A number of recent reviews and meta-analyses have attempted to assimilate and quantify the effect of PA interventions in SMI populations, and thus provide an overall overview picture of the role PA intervention can have on physical and cardiometabolic health and SMI (Czosnek et al., 2018; Firth, Cotter, Elliott, French, & Yung, 2015; Rosenbaum et al., 2014). While this critical review does not attempt to offer a critique of these review papers, it will instead highlight where evidence is conclusive and where it is not in relation to SMI comorbidity and PA and or SB.

Weight-loss is widely considered a primary motivating factor to exercise among people with SMI (Firth et al., 2016), a finding also widely shown throughout qualitative research (See section 2.5 for more detail) Within the literature, there is evidence from high quality intensive RCTs that exercise intervention may affect weight loss in SMI populations such as SZ. One such trial, the STRIDE intervention, implemented weekly group meetings with an emphasis on social support in addition to 20 minutes of PA sessions for a six month period in a sample of N=200 people with SZ in community MH setting from the USA. After six months, participants were invited to attend group sessions aimed at problem solving and maintaining motivation (Green et al., 2015). Between baseline data and six-month follow-up, the intervention group had a 4.4 kg greater weight reduction compared to control conditions. A significant weight loss relative to control was sustained at 12-month follow-up, albeit a reduced size from six-month measurements. Similar to the STRIDE trial, an earlier walking intervention showed comparable findings through a shorter, lower intensity aerobic PA intervention of 16 weeks walking exercise intervention with ten individuals with SZ from outpatient services in Florida. The findings showed significant reductions in body fat (3.7% vs 0.02%) in the intervention group compared to control group (Beebe et al., 2005). The work of Beebe *et al*. (2005) is promising in that the results speak to the existence of some relationship between weight and exercise, which may be effected by light intensity PA and in the absence of intensive motivation components seen in the effective STRIDE study. However, the intervention by Beebe *et al.* (2005) is limited in its offering of translational knowledge for clinical practice due to its small sample size and lack of post intervention follow-up. In addition, limitations discussed in the STRIDE trial point to poor intervention attendance, with only 60% of the sample meeting the desired attendance. This issue points to fundamental challenges with engagement and maintenance of PA which is likely influencing the wider research picture with respect to health benefits accrued from PA engagement. While the two trials discussed here indicate that weight reduction may be achieved through exercise intervention, albeit likely in conjunction with wider motivational and social support structures, the findings of these two studies are largely stand-alone. Meta-analyses (inclusive of Beebe *et al.* 2005/ not inclusive of Green *et al.* 2015) examined 20 RCTs and non-controlled exercise interventions of people with SZ (Firth et al., 2015). The findings of this meta-research indicate that exercise interventions in isolation from dietary and other lifestyle related interventions only have modest effects on BMI and or weight reduction in people with SZ, if at all (Firth et al., 2015; Gorczynski & Faulkner, 2011).

For example, one RCT exposed a sample of sixty-three people with SZ to an intervention of two hours of weekly PA including aerobic and resistance exercise at moderate intensity for six months duration (Scheewe et al., 2013). The findings showed no significant change in weight-gain following exercise intervention. Notably however, this intervention did not have dietary or motivational components structured into to intervention exposure. Another controlled trial, not included in the aforementioned meta-analysis by Firth *et al.* (2016), implemented a lifestyle intervention, including exercise delivered by an exercise physiologist in conjunction with dietary intervention and peer-support in sixteen young people with SZ. The results of 12 weeks intervention showed significantly greater weight-gain among the usual care comparison group, demonstrating that comprehensive lifestyle intervention including tailored PA (moderate to vigorous PA - MVPA) (est. 60-75% VO_2 max) in line with PA guidelines may offset weight-gain that is associated with antipsychotic treatment commencement (Curtis et al., 2016). In context, the authors suggest that this is a clinically meaningful outcome.

Looking to the aforementioned trial conducted by Curtis *et al.* (2016), secondary outcomes measures reported include significant increases in aerobic capacity or cardiorespiratory fitness (CRF) in raising PA levels to meet NPAG. Improvements in CRF are seen across studies where no significant improvements are shown in relation to weight or BMI (Scheewe et al., 2013). This finding represents a move within the literature to consider CRF as a primary outcome measure in PA and exercise research for people with SMI (Vancampfort, Rosenbaum, Schuch, Ward, Richards, et al., 2016). Meta-analyses of exercise trials in people with SZ found that 10 out of 11 studies which included CRF as an outcome measure found significant improvements in exercise groups relative to control comparisons (Firth et al., 2016). Cross-sectional research with a sample forty people with BPD found that higher CRF was associated with higher quality of life with respect to physical and MH (Vancampfort, Hagemann, et al., 2017). In addition, the move within the literature is supported in the wider literature from studies in the general population. One notable review and meta-analysis that included 10 studies with samples taken from the general population showed that overweight individuals that have high CRF do not have increased risk in all-cause mortality, but rather, being overweight and having low CRF doubles the risk of all-cause mortality (Barry et al., 2014). These findings may have considerable importance in the context of weight gain associated with antipsychotic medication usage (Bak et al., 2014). In this respect, the preclusion of weight gain shown in Curtis *et al.* (2016) is also likely to be a clinically meaningful outcome. These points suggest that there may be a need for reformed guidance and revised education among those who are tasked with supporting PA in MH setting, such as MH service providers. It is not clear if the limited efficacy that PA has in relation to weight management, and the wider wellbeing and MH benefits of PA for people with SMI have percolated down the clinical practice agenda. In this regard, there appears justification to explore these perceptions and explore experiences in relation to these phenomena across populations that have this support role.

2.3.7 ‘Recovery’ and SMI

To understand the role that regular PA and reduced SB may have in relation to recovery, recovery must first be understood as a concept. However, recovery as a concept is poorly defined in the literature. Broadly speaking, it appears that recovery should be understood in three separate manifestations which are explained further in this section (Davidson et al., 2005; Higgins & McBennett, 2007). In this current research project, all three recovery guises have relevance and will be discussed throughout all sections but will be clearly differentiated through some key distinctions between them. First, clinical recovery relates to a significant reduction in symptomology and signs of mental illness, and a return to more normal levels of social, occupational, and cognitive functioning. In this context, the term recovery is still used for individuals who regain normal functioning and where psychiatric symptoms abate (Davidson et al., 2005).

Personal recovery relates to the process (oft termed *journey*) of constructing or re-constructing a personally meaningful life within and beyond the limits of mental disorder, which may occur in the presence or absence of medical intervention (Andreasen et al., 2005; Jensen et al., 2019); and does not necessarily imply symptoms or deficits cessation (Davidson et al., 2005). This concept of recovery is born out of mid-twentieth century ‘consumer’ and ‘independent living’ movements among people with disabilities and MH difficulties (Davidson et al., 2005). In investigating the role that PA has in relation to this concept of recovery, qualitative literature is arguably the best placed method of inquiry (Soundy et al., 2014). This phenomenon will be explored further in Section 2.5 of this critical review.

Finally, the third concept of recovery that must be understood is also referred to in this work as a recovery approach to care. Under this guise, recovery refers to a specific ethos and philosophy which shape the structure and approach in which a particular MH service operates. This final conceptualisation of recovery will be explained in greater detail in Section 2.6 of this critical review. These distinguishing aspects of recovery are important to make at this point in the critical review as these are corner stone aspects of contemporary mental health care, but often appear to be missing from the discourse of PA and SB implementation in MH care service delivery. In critically reviewing the literature, it is therefore relevant to examine PA and SB through this MH paradigm in which services are delivered (HSE, 2018).

2.3.8 Physical activity and clinical recovery

Within MH and PA literature, the disorder in which evidence for a therapeutic effect is most abundant is depression (Czosnek et al., 2018). Unlike many other mental disorders, comprehensive research links regular PA participation as a protectant against future development of depression. Additionally, research shows that those with diagnosed depression but who remain active, typically experience less severity of illness when compared to those that become inactive (Meyer & Schuch, 2018; Schuch et al., 2018). While these studies suggest that a therapeutic role is present, the evidence on such a therapeutic effect has been the subject of controversy within the literature. This controversy pertains to two important studies with the potential to exert influence on MH policy. First, a Cochrane Review published in 2013 showed PA intervention to have only a modest effect size in relation to its antidepressant effect from structured PA delivered by a RCT in people with Major Depressive Disorder (MDD). This effect equated to no statistically significant difference between exercise interventions and pharmacological interventions (n=300 participants/ n=4 trials) and psychological interventions (n=189 participants/ n= 7 trials), concluding that PA offers only modest benefits in relation to clinical recovery (Cooney et al., 2013).

However, following the publication of the above referenced Cochrane Review, a meta-analysis and separate article have challenged the findings of the Cochrane Review for exercise in depression (Ekkekakis, 2015; Schuch et al., 2016). In their meta-analyses, Schuch *et al.* (2016) found a large antidepressant effect size, which was more pronounced for outpatients, and also if supervised by an exercise practitioner following PA intervention for people with SMI. Additionally, moderate, and vigorous aerobic interventions were shown to yield better antidepressant outcomes compared to light intensity exercise intervention. Insufficient literature was available to determine if stand-alone resistance training was as beneficial as aerobic exercise (Schuch et al., 2016). This meta-analyses by Schuch *et al.* (2016) is noticeably limited by the inclusion of only one study in which the exercise intervention exceeds 16 weeks follow-up. Subsequently, a three group (Supervised exercise- NPAG, Online CBT, Usual care) 12-week RCT has been carried out across a sample of > n=900 people with MDD. The findings indicate that a significant antidepressant effect of exercise may exceed that of usual care. In addition, the findings showed that effects may be sustained up to a one year (Hallgren et al., 2016).

Looking beyond diagnoses of MDD, another meta-analysis has investigated the antidepressant effect of exercise and recreational PA trans-diagnostically. Similar to the previously discussed review, a large effect size (standardised mean difference of 0.80) was found indicating beneficial response to PA across transdiagnostic groups that experience negative symptoms of affect (Rosenbaum et al., 2014). Most of the studies included in the review incorporated an aerobic component of exercise. However, no statistically significant differences in intervention effect were seen between interventions that met American College of Sports Medicine (ACSM) guidelines for aerobic training and those that did not. There was insufficient available literature on the efficacy of resistance training in mediating an antidepressant effect in SMI diagnoses (Rosenbaum et al., 2014). This paper, along with the review from Schuch *et al.* (2016) shows PA interventions to be highly efficacious as a treatment for depressive symptoms across SMI diagnoses. However, both papers come with a cautionary note advising that prescription thresholds such as frequency and intensity that bring about antidepressant effects are unclear. Regardless of this, the antidepressant effects observed at sub-threshold levels make for promising clinical implications, particularly in vulnerable SMI groups. These benefits found at sub-threshold levels within the literature demonstrate the importance of replacing extended SB with PA of any intensity for person with SMI.

2.3.8.1 The effect of physical activity on positive symptoms

A number of studies have explored if PA and exercise interventions offer a viable therapeutic endeavour to address positive symptoms in SZ. Despite limited trial data, a 2011 Cochrane review (three studies included, totalling 96 participants) has provided synthesis of evidence. The findings of this review indicate reductions in psychiatric symptoms of SZ and psychosis following PA intervention (Gorczynski & Faulkner, 2011). Gorczynski and Faulkner suggest that PA interventions have modest benefits for symptoms of SZ. More recently a review inclusive of sixteen interventions and trial-based studies on PA and SZ has been carried out (Firth, Cotter, Elliott, French, & Yung, 2015). In examining the findings of this review, four trials pooled which had implemented >120 mins/week of MVPA found that PA interventions at this level of intensity may bring about strong significant reductions in positive and negative symptoms (standardised mean difference of 0.72, 95% CI -1.14 to-0.29). The authors of this study note that the sensitivity of effect that PA and exercise brought about was reduced when lower intensity PA was included in the analysis, thereby indicating that the most potent effect of PA for positive symptoms associated with SZ were achieved beyond 90 minutes of MVPA/week. Among studies included within the review by Firth, Cotter, Elliott, French, & Yung (2015), samples sizes are relatively small, which is a limitation to the findings of this research. The largest sample within an included study was 39 participants in yoga and 22 participants in an exercise comparison group (Varamabally et al., 2012), demonstrating the scale of the deficiencies within SZ trial samples sizes. Firth *et al.* (2015) observed that trials where resistance exercise training was incorporated, all studies demonstrated significant improvements in MH symptomology. Yet, at present, the evidence remains too weak to make revised formal recommendations on resistance exercise training to improve positive or negative symptoms (Stubbs et al., 2018). Additionally, in looking at studies where resistance exercise training was utilised as an intervention, Heggelund, Morken, Helgerud, Nilsberg, & Hoff (2012) relied on clinical exercise physiologists to manage incremental increases of weight with respect to maintaining determined load for the intervention. Just six participants were included in the intervention arm of this study and as such, it seems likely that the findings have poor applicability to translational evidence for practice. That said, this evidence points to likely MH benefits accrued through more moderate to vigorous intensity PA, such as where resistance exercise is incorporated. This complex type of PA will likely require expertise of professionals beyond that of traditional MH service providers.

2.3.8.2 Bio-explanation of effect

In the context of contributing to clinical recovery, there is robust evidence that certain mental illness symptomologies can be improved through PA interventions (Rosenbaum et al., 2014; Schuch et al., 2016; Czosnek et al., 2018; Stubbs et al., 2018). The exact mechanisms by which PA reduces mental illness symptomologies remain a challenge for research. The evidence points to a number of pathways, which likely act in combination. For example, the antidepressant effect of PA is supported through literature on hormonal release, specifically neurotrophines, inflammatory biomarkers (Schuch et al., 2016a). There is also growing evidence for increased hippocampal volume following long term PA for people with MDD. This hypothesis is strengthened by evidence for an even larger effect on hippocampal volume change in research with non-SMI populations (Firth, Stubbs, et al., 2018). That being said, severe mental illness is characterised by multiple alterations in physiology in addition to psychosocial adaptation, and therefore, there is not one mechanism on which PA interventions act in isolation to moderate symptoms (Meyer & Schuch, 2018). And so the scientific literature to date is still unable to unearth any one biochemical alteration driving antidepressant and or other effects on other psychiatric symptoms as of yet (Schuch et al., 2016a).

2.3.8.3 Physical activity and psychosocial effects

People with higher levels of PA also have increasingly demonstrated better recovery outcomes from PA and SB interventions in a number of psychosocial domains. For instance, a recent Dutch study with 184 patients with experience of long-term inpatient care found that PA levels (objectively measured with ActiGraph GTX+) were positively associated with markers of quality of life measured using EuroQol-5d and WHOQol-Bref (Deenik et al., 2017). Other research from the UK, the first of its kind, has found that higher rates of PA are associated with significantly fewer acute admissions to inpatient services (Korge & Nunan, 2018). It must be acknowledged that both studies highlighted in this paragraph are cross-sectional in design, and therefore somewhat limited in their translational knowledge. Nevertheless, these studies offer real world outcomes that align with recovery orientated care that allude to an improved picture of recovery. While these studies present quantifiable biological rationale for positive clinical recovery outcomes there are evidently nuanced experiences of PA and how it influences clinical recovery that are less well understood. There is a need to explore this in research to further advocate for its role in recovery focused care.

2.3.9 Physical activity levels

A number of studies have demonstrated that people with SMI achieve a level of PA that is significantly less than matched healthy controls, albeit measured using different approaches and varying SMI diagnostic groups (Fraser, Chapman, Brown, Whiteford, & Burton, 2015; Kilbourne et al., 2007; Lindamer et al., 2008; Northey & Barnett, 2012; Roick et al., 2007; Vancampfort, Firth, et al., 2017). Reacting to considerable variance in PA levels seen across the literature, recent meta-analyses have assimilated studies measuring PA and SB of people with SMI. Four key meta-analyses provide evidence on the topic of PA in this regard. These are meta-analyses with a focus specifically on; major depressive disorder (MDD) (Schuch et al., 2016), Bipolar disorder (BPD) (Vancampfort, Firth, et al., 2016), schizophrenia and other psychotic disorders (Stubbs, Firth, et al., 2016) and outpatients with schizophrenia (Soundy et al., 2013). In addition to these diagnosis specific meta-analyses, another meta-analysis has synthesised the literature on transdiagnostic people with SMI and their levels of PA and SB. included 69 studies with a total sample of 35,682 (Vancampfort, Firth, et al., 2017).

Looking first to the disparity in PA levels between SMI populations and the matched general populations, the transdiagnostic meta-analysis shows a small but significant mean difference between groups of over 10 minutes a day for moderate PA and over three minutes a day for vigorous PA (Vancampfort et al., 2017). Further, diagnoses specific meta-analyses show that PA level discrepancy compared to matched general populations were more pronounced in relation to moderate and vigorous intensity PA. This finding was shown in SZ (Stubbs, Firth, et al., 2016) and MDD (Schuch et al., 2016). In examining light intensity PA, the disparity between SMI populations versus matched healthy population appears lessened, suggesting that light activities such as walking, are likely to be widely accepted by people with SMI like schizophrenia comparable to those without mental illness (Soundy et al., 2013; Stubbs, Firth, et al., 2016). It is unclear if one diagnoses group has a greater propensity for PA or SB compared to others diagnoses groups. However, based on the evidence to date, it seems likely that people with diagnosis of BPD engage in significantly greater amounts of moderate and vigorous PA compared to those with schizophrenia type disorders and MDD, which may be a reflection of symptomology characteristics (Vancampfort, Firth, et al., 2017).

2.3.10 Levels of sedentary behaviour

The differences in PA levels between those with SMI versus non-SMI populations demonstrate differences that occur along nuanced lines such as diagnoses and type of PA. Considering sedentary behaviours, which as separate from ‘inactivity’, disparities between people with SMI and matched healthy controls are found in recent meta-analyses (Stubbs, Williams, et al., 2016; Vancampfort, Firth, et al., 2017). Recent transdiagnostic meta-research shows a mean difference of over 10 minutes daily between groups, indicating that people with SMI are significantly more sedentary. This total sedentary behaviour equated to an average of 7.9 hours engaged in SBs daily (Vancampfort et al., 2017). Another meta-analysis specifically focusing on diagnoses of psychotic illness found participants to have a mean sedentary behaviour of 11 hours daily. Alarmingly, this amounted to a mean difference of 2.80 hours compared to matched general population (Stubbs, Williams, et al., 2016). In considering this finding, the acute nature of psychotic episodes must be considered an influence on the dramatic SB time reported. This is highlighted further by Vancampfort and colleagues, who show that having a diagnosis of BPD is a stronger influence on SB compared against diagnoses of schizophrenia type disorders and MDD (Vancampfort, Firth, et al., 2017). The propensity for people with BPD to engage in greater amounts of SB raises interesting questions about variance in PA levels and SB across diagnostic groups, as persons with BPD were also shown to engage in higher levels of PA relative to other diagnoses. Regardless of this disparity between diagnosis groups, the findings on SB presented are nonetheless broadly worrying. In context, persons from the general population with SB beyond 3 hours daily are linked to a two year reduced life expectancy regardless of PA behaviours (Katzmarzyk & Lee, 2012). This overall research project focuses on rehabilitation and recovery MH care in Ireland. Rehabilitation and recovery are by definition transdiagnostic (Lavelle et al. 2006). It seems pertinent that research which examines SMI populations PA and SB levels should attempt to delineate diagnostic grouping on account of the reported differences in the literature and subsequent implications.

2.3.11 Physical activity guidelines and severe mental illness

The broad variance in the research that has examined the PA levels of people with SMI against matched controls, not surprisingly, is seen in research that has examined PA against PA guidelines. For example, one study, using OBM, specifically single axis accelerometery (ActiGraph AM 7164) for seven-day wear with a sample of 60 people with BPD found that no participants were met the PA guidelines (≥150m of MVPA a week). In addition to this, 80% of participants’ wear time was classed as SB (Janney et al., 2014). Conversely, other research carried out in Australia which included 141 outpatients with a range of SMI diagnoses found that up to 70% of the sample were successfully meeting PA guidelines (Chapman et al., 2016). This was shown to be 65% in a separate study with inpatient SMI populations (Fraser et al., 2015). Although, not overlooking the potential role that measurement tool accuracy and sensitivity may play in this demonstrated disparity, these findings suggest that PA levels among SMI populations may vary widely depending on treatment and locational contexts and the associated influencing factors, diagnoses differences and differing treatment contexts (inpatient versus outpatient etc.). Despite this challenge, synthesise in the literature using transdiagnosis meta-analyses has been carried out (Vancampfort et al., 2017). The findings from this analysis show that over 54% of people with SMI do not meet PA guidelines, a finding which was significantly worse compared to matched healthy controls (Vancampfort, Firth, et al., 2017). Additional analysis revealed that diagnostic subgroups varied in relation to those not meeting PA guidelines; this was 31% (BPD), 54% (SZ), and 60% (MDD), suggesting that BPD diagnoses may be a more physically active subgroup of people with SMI (Vancampfort et al., 2017). A separate review focusing specifically on diagnoses of depression (Schuch et al., 2017), found that 68% of participants did not meet PA guidelines; a similar finding to that of (Vancampfort et al., 2017). The uniformity of findings here suggests high levels of physical inactivity are common among those with major depression. The meta-research discussed in this section point to a wider variance across diagnostic groups in relation to PA levels and also those meeting guidelines which require consideration in research. Nevertheless, there appears to be relative consistency with regards to a 40-60% rate with regards to persons with SMI not meeting PA guidelines across the meta-analytic spectrum of research.

The referenced studies above do not show a consensus in relation to differences between males and females in their PA behaviours. For instance, transdiagnostic literature shows males with SMI less active compared to females (Vancampfort, Firth, et al., 2017). The literature that has specifically focused on MDD and BPD shows that differences between genders in relation to PA behaviour are not statistically significant (Schuch et al., 2016; Vancampfort et al., 2016). The uncertainty in this regard warrants investigation of these variables in research examining PA behaviours and SMI to explore if gender plays a role in influencing PA levels. This may inform additional tailoring of PA and SB interventions for gender specificity.

In addition to variance in PA levels between diagnostic groups, treatment context appears to also play a role in PA behaviour. People with SMI in community-based treatment appear consistently less active than inpatients (Vancampfort, Firth, Schuch, et al., 2016). For instance, a meta-analyses that looked at PA behaviour and MDD diagnoses shows that outpatients were less likely to meet PA guidelines when compared against community dwelling participants (Schuch et al., 2017). In looking to specific cross-sectional research, Fraser and colleagues show that inpatients adults with SMI in Australia have been shown to achieve have good adherence to the PA guidelines (65%) but with low numbers of these engaging in regular bouts of moderate intensity PA (Fraser et al., 2015). It appears in this instance that persons with SMI have been availing of structured PA sessions as part of inpatient care. Consequently, almost half of the sample in the study by Fraser *et al.* (2015) engaged in some vigorous PA in a typical week. These findings suggest that inpatients engage in more PA compared to outpatient counterparts. However, in meta-analytic research looking at total PA levels among differing SMI populations, it appears that this finding is not repeated (Vancampfort, Firth, et al., 2017). Considering this, it seems likely that this difference pertains to higher intensity activities only, which may be as a consequence of structured PA interventions within some clinical settings.

There is considerable evidence of variance in PA levels against PA guidelines between treatment setting groups and across geographical settings. Large scale meta-analyses may fail to capture the types of PA or exercise people with SMI are engaging in and the contexts in which PA has been carried out. This may have a bearing on PA level variance and further explain where differences do or do not occur. These factors must be considered with all PA outcomes studies. The variance that may occur with regard to PA levels between people with SMI in different residential and treatment settings, in addition to diagnostic differences, age and other psychosocial differences gives justification for further investigation of influencing factors on PA levels and SMI populations in an Irish setting of outpatients such as rehabilitation and recovery MH services. In the context of the current research, rehabilitation and recovery have been identified as the potential population that are arguably most in need of service re-design with respect to PA programme development.

2.3.12 Section 1 summary

People with SMI have deteriorating life expectancy which appears tied to a myriad of co-occurring physical comorbidities can in-part be affected by modifying a number of lifestyle-related behaviours such as diet, smoking, reducing SB and increasing PA. Within the literature, the concept of recovery can be viewed under three separate guises. In reviewing the literature, all three of these concepts are considered in framing the evidence that PA has role within integrated rehabilitation and recovery MH services for people with SMI. This section (Section 1), largely deals with the literature which demonstrates clinical relevance of PA and SB in the context of SMI. The remaining two recovery concepts will be discussed in Section 2 and 3.

This section also details the physical inactivity challenge which exists in MH populations generally. While research points to certain MH populations being more physically active than others, there is nonetheless little or no evidence from the Irish perspective in this regard, therefore warranting detailed examination of this issue to help inform PA and SB interventions for people with SMI in Ireland in health services settings.

Chapter 2, Section 2.3, differentiates between PA and SB as epidemiological concepts, demonstrating that research of the same nature with people with SMI requires added consideration and methodological planning. In this section of the critical review, PA interventions appear to be an effective approach to addressing symptoms among certain diagnostic groups, with robust evidence that affective symptoms may be improved among SZ and MDD diagnoses, thereby reflecting the overriding issue of symptom management that accompanies clinical recovery. In addition, transdiagnostic research shows improved CRF and quality of life from PA interventions. Section 2 of this critical review examined the literature to investigate the role that PA has in the journeyed recovery and Section 3 of this critical review examined the literature with regard to developing PA within existing MH services within the parameters of the recovery approach to care.

Previous narrative synthesis (Soundy, Roskell, et al., 2014), and meta-analysis (Vancampfort, Firth, Schuch, Rosenbaum, De Hert, et al., 2016), have raised questions on the suitability of a number of SRQs, including some validated tools in relation to their suitability to measure PA in people with SMI. Both these studies advocate for a concerted focus on the use of OBM in this regard instead of SRQs. However, considerations of primary studies that have utilised favourable OBMs show variability in measures used, and consequentially, differing cut points and epochs (Bueno-Antequera, Oviedo-Caro, & Munguia-Izquierdo, 2017; Kruisdijk et al., 2017). On top of this limitation for use within SMI populations, OBM are restricted to measuring PA and SB within certain domains of activity. In addition, the strengths of using SRQs in relation to maximising population sample size, reducing participant burden, and low cost are well documented PA epidemiology (Dishman et al., 2001). The literature shown here in Section 1 makes clear that there are limitations to using SRQs to measure PA levels and in particular SB of people with SMI. Moreover, meta-research with transdiagnostic SMI populations (Vancampfort, Firth, et al., 2017), and SZ (Stubbs, Firth, et al., 2016), also show pooled vigorous PA to be over-reported using SRQs relative to OBM. Taken together, there appears clear merits and limitation in utilising both SRQs and OBM studies to measure both PA and SB in SMI populations. In the absence of more sensitive specific measurement tools for measuring these behaviours in SMI, it is argued that research which seeks to examine PA and SB behaviours of people with SMI should endeavour to utilise both methodologies, where the research aims and resources permit.

Section 2: The factors that influence regular physical activity and sedentary behaviour

2.4 Section introduction

People with SMI stand to benefit from improved physical and MH outcomes that reflect recovery MH practice when engaged in PA interventions (Firth et al., 2015; Rosenbaum et al., 2014; Stubbs et al., 2018). Recognising this, and the relative low levels of PA and high levels of SB among people with SMI, this section of this critical review examines the literature which has investigated the factors which influence PA and SB of people with SMI. In doing so, this Section 2 has three functions. The first is to examine existing literature on intervention and trial research to examine intervention components that may improve PA or SB outcomes in SMI populations. The second aim is to examine existing research on the factors that influence PA, with the view to identifying a theoretical framework that is applicable to this research project. Lastly, in this section a review of the qualitative literature which has explored experiences of PA for people with SMI and other key stakeholders involved in the therapeutic alliance will be carried out to understand experiences and qualitative data that may not be readily captured through quantitative methods. The specificity of the last function of this review will be made clear to readers in Section 2, 2.5.4. Taken together, these three functions will inform and support the individual studies of this current research project which contribute to the development of the *Move with Recovery Programme* (MWRP).

2.4.1 Factors of influence from intervention research

While there has been development in the area of intervention research in recent years, there is a noticeable paucity of intervention research including controlled and un-controlled trial studies that have primarily sought to increase PA or reduce SB in people with SMI (Ashdown-Franks et al., 2018). The existing intervention research is discussed here in this section in order to examine intervention specifics that may be contributing to changes in PA and or other noteworthy outcomes.

Among existing interventions and RCTs which seek to demonstrate outcomes of clinical recovery from exercise, few have focused solely on diagnoses of BPD (Melo et al., 2016). Of those that have, most are made up of small samples with arguably limited translational information. For instance, one study by Sylvia *et al.* (2013), has just five persons included in the investigation. A much larger body of exercise intervention research is available in relation to SZ (Firth et al., 2015; Rosenbaum et al., 2014), and MDD (Cooney et al., 2013; Schuch et al., 2016). Some of the primary research included within these review studies have been discussed in earlier sections in an effort to make clear to the reader the evidence which shows clinical recovery outcomes from PA interventions (see Section 1, 2.3.6). While this provides a supporting evidence and background, the current research project outlined in this thesis does not endeavour to examine a therapeutic effect from PA per se. But rather, the current research is part of a wider research project seeking to develop a PA programme to improve PA and SB among people with SMI. In this regard, this section seeks to uncover specific factors that influence PA that have been previously documented in intervention research.

Within intervention and trial research, it seems that interventions which are effective (favourable effect on PA levels, symptoms or anthropometry), typically have intensive PA counselling or motivational support in addition to the exercise components of the interventions (Ashdown-Franks et al., 2018). For example, successful RCTs carried out in people with SZ have utilised multi-therapeutic interventions including dietary advice in addition to exercise interventions. Two interventions which have taken this multilevel intervention approach have also delivered exercise through trained exercise professionals, as opposed to existing members of the MH team (Curtis et al., 2016; Daumit et al., 2013). Daumit *et al.* (2013) utilised an 18-month tailored PA programme with >200 participants with SMI (predominantly SZ) in an outpatient rehabilitation programme in the USA. The findings show that adjunct PA counselling in addition to exercise yielded better results in reducing antipsychotic related weight gain compared to control the group, who were provided with PA information only (Daumit et al., 2013). Similarly, intensive interventions such as multidisciplinary working approaches within interventions appear beneficial in effecting outcome measure changes. The Keeping the Body in Mind

Programme in Australia has shown that dietary interventions from a registered dietician, in addition to PA programming from an exercise physiologist and motivational support from Peer Support Workers (PSWs) is an effective approach for attenuating weight gain in those experiencing first episode psychosis over a 12 week period of intervention (Curtis et al., 2016). In their study, just 13% of participants gained weight upon treatment for first episode of psychosis. This presents a contrast to significant weight gain among 75% of those in receipt of usual care (Curtis et al., 2016).

Physical activity interventions on people with MDD that are effective in relation to outcome measures of reduced symptoms of depression also have utilised intensive intervention structures such as that of interventions on people with SZ discussed in the previous paragraph (Hallgren et al., 2016; Hallgren et al., 2015). In Hallgren *et al*. (2015), 946 people with MDD recruited from primary care in Sweden participated in an exercise RCT. The intervention groups were facilitated in group exercise that was supervised at light, moderate and vigorous levels of intensity for 12 weeks duration. Participants also received text message support from an exercise professional. In this study, the authors found that the exercise intervention was effective in significantly reducing symptoms of depression after 12 weeks (Hallgren et al., 2015), and after 12 month follow-up with continued, albeit stepped-down motivational support (Hallgren et al., 2016). This intervention resulted in an increased level of PA and improvements in symptoms of depression in the immediate and long-term. However, this research also points to an effect gleaned from intensive exercise interventions that are group-based, supervised, and feature a variety of motivational supports from intervention providers.

With the above point considered, it seems challenging to distinguish between intervention components which may or may not be useful in effecting PA behaviour change in SMI populations. Such uncertainty within the intervention research is likely to have clear implications for translation of these findings into real world clinical practice and outcomes. Previously the Trial of Exercise and Depression in the UK, known as the TREAD trial carried out by Chalder *et al.* (2012), utilised motivational interviewing-style counselling on PA to support and facilitate more autonomous PA practices among a sample of 182 people with MDD living in the UK. Crucially, the TREAD trial did not seek to provide structured PA to participants. However, the outcomes measured included symptoms of depression measured by the Beck Depression Inventory were not significantly improved at four or twelve-month time points, and no significant changes were shown in relation to PA levels (Chalder et al., 2012). Comparing this study against previously discussed studies, such as that of Daumit *et al.* (2013) and Hallgren *et al.* (2016), indicates a key point for PA programme development. The findings suggest that structured PA sessions with a trained exercise professional which are likely to be in a group setting, may be necessary to effect MH symptoms benefits and increase levels of PA among some SMI populations. It should be noted that while PA levels did not show statistically significant differences, the levels of PA among intervention participants from the TREAD trial were shown to increase marginally. In addition, in the TREAD study and the trial by Hallgren and colleagues, all interventions were delivered to those accessing primary and GP care for depression. This fact indicates a likely lower level of mental health service dependency, which suggests that the role of trained exercise practitioners may be more pertinent among more severe and enduring SMI populations. Furthermore, PA levels were measured using SRQs which is arguably limiting on account of recall bias (Soundy et al. 2014). With this point in mind, it seems necessary that a detailed exploration of PA experiences from the perspectives of key stakeholders is needed to understand the issues in relation to providing structured PA. For instance, it is not clear if structured PA is viewed as a fundamental component of PA provision in routine care across settings. In addition, this point raises questions on the level of training that service providers have on PA and whether it is sufficient to meet the needs of service users.

The intensive and multifactorial nature of the interventions discussed in the above paragraph make it challenging to decipher what role or benefit motivational and educational components of PA interventions play. In probing this question further, two notable interventions have been carried out using relatively sizable samples of people with SMI that have utilised only a motivational and educational intervention components

(Göhner, Dietsche, & Fuchs, 2015; Holt et al., 2018). First, Göhner *et al.* (2015) utilised just two 60-minute motivational and educational sessions and subsequent telephone coaching six weeks post intervention with a sample of 112 people with SMI (mostly made up of those with affective disorders). The findings showed an increased PA level among intervention participants (95 mins greater PA per week versus control, p= .02) from PA coaching. In this motivational and educational intervention, a series of techniques based on the Behaviour Change Theory, including information on 'overcoming barriers', 'action planning' and 'behaviour monitoring' for PA were utilised. However, separately, the RCT carried out in the UK by Holt *et al.* (2018) named the STEPWISE trial, did not share the findings outlined in Göhner *et al.* (2015). Holt *et al.* (2018) used a RCT design with N=400 people with SZ. The intervention consisted of four-weekly sessions of (150 minutes duration) of lifestyle education and monthly follow-up and motivational support through face-to-face meetings and phone calls. The information imparted to participants was informed by Self-regulation theory, the Self-efficacy theory and a Relapse prevention model, centred on components that included dietary and PA guidance, albeit it seems dietary information and motivational content was the predominant focus. The control conditions were treatment as usual and some written lifestyle advice. Following the intervention, there were no statistically significant changes in PA levels or body weight between the intervention participants and control condition of the trial (Holt et al., 2018). The research findings of both (Göhner et al., 2015; Holt et al., 2018), appear to sit at odds with one another. However, key distinctions should be made between these studies, which may be pertinent in understanding factors which have influenced PA behaviour change. For example, Göhner *et al.* (2015) comprises of inpatients largely made up of persons with affective disorders. Conversely, Holt *et al.* (2018) is made up of a sample of outpatients with SZ. It is possible that the diversity between these population groups is telling of the difference in findings. For example, previously inpatients have been shown to receive greater support in relation to PA by the very nature of their structured routines. It is possible that the same is shown here in relation to support received whilst engaged in a motivational and educational intervention.

Bringing together the findings of the two interventions discussed in the previous paragraph, it seems likely that outpatients with SMI, who are the focus of the current research, are likely to have insufficient support to receive only motivational and educational intervention in the pursuit of increased PA levels. Such conclusions are grounded in the negative results, but high methodological rigour and large sample used in Holt *et al.* (2018). This high-quality intervention suggests that PA interventions should include some version of supervised PA sessions in order to increase PA levels or to effect anthropometric change. While the results of the STEPWISE trial were negative in the context of PA levels, the trial participants reported value in the social engagement allied to the intervention. The value of group-based PA is something which has arisen from qualitative evaluation of PA intervention in an Irish setting previously (Iwata et al., 2016). Presently, the research by Iwata *et al.* (2016), which focused on a woodland walking intervention, is the only intervention in an Irish setting to date which is available in published literature. More research is needed to explore the role of social support for people with SMI to identify how this can be facilitated further and built into PA programmes for MH services going forward. The role of group-based PA as an influencing factor will be discussed in more detail in later sections of this writing.

Trial-based research has shown a value in PA interventions that move PA component parts out to community-based initiative. For example, the In SHAPE trial utilised individualised sessions with fitness instructors to motivate participants with SMI (n=76) to engage in PA. Each fitness ‘mentor’ encouraged participants to attend group-based exercise sessions. Participants were provided with free access to a local leisure facility and were incentivised with prize rewards for participation (Van Citters et al., 2010). Findings from the research showed participants had reduced severity of negative symptoms and psychological functioning between baseline and nine-month follow-up. Importantly, participants’ level of PA significantly increased based on SRQ findings. Over 70% of participants returned nine-month follow-up data. The findings show that from baseline to nine-month follow-up, participants increased their weekly PA by 1.1 hours/ per week, this included PA preformed at light and vigorous intensity. The In SHAPE trial demonstrates a value in tailored community-based PA intervention for people with SMI. As with trials mentioned in the previous paragraphs, this study alone is challenging to replicate on account of the intensive approach used which included multiple intervention components. Moreover, Van Citters *et al.* (2010) did not utilise control conditions in their research which limits the findings to a degree. Nonetheless, these findings point to acceptability and effectiveness for some community-based PA programmes in some circumstances for people with SMI. This finding presents an interesting contrast to effective interventions using exercise professionals as part of the integrated care model in programmes such as Keeping the Body in Mind (Curtis et al., 2016).

The findings from the In SHAPE trial have considerable importance in informing the current research that go beyond that of interventions such as the Keeping the Body in Mind where extensive specialised multidisciplinary interventions are provided. It seems that Van Citters *et al.* (2010) exemplifies beneficial effects on PA levels from a type of PA that is bridged to community settings. This may have meaningful translation implications for an Irish context, where currently there are no exercise professionals within multidisciplinary teams and PA is provided by the existing MH service providers such as occupational therapists and MH nurses (Matthews, Cowman, & Denieffe, 2018). In this regard, it may be particularly important for services to leverage resources that are accessible to service to supplement PA provision.

2.4.1.1 The limitations of intervention research for understanding factors that influence physical activity

The intervention studies discussed in the above paragraphs are useful for indicating intervention component parts that might impact behaviour change in people with SMI. However, the applicability of such RCTs to inform behaviour change in real world clinical settings has been questioned in recent research (Deenik et al., 2019). For instance, Deenik *et al.* (2019) argue that, intervention research with regard to PA in MH settings are typically done so under ‘ideal’ conditions. That is, that the interventions which demonstrated effectiveness appear to be challenging to replicate in a normal clinical setting. This point can be exemplified through rough comparison of data on intervention adherence in SMI populations versus data on the take-up of therapeutic PA programmes within clinical settings. Using this example, there is good evidence to suggest that people with MDD have exercise trial dropout rates that are less than 20%, levels of adherence to PA interventions which are comparatively better than matched controls and in line with other clinical populations with chronic illness (Stubbs, Vancampfort, et al., 2016). It seems that supervised exercise professionals delivering interventions or support received from within an inpatient setting are predictive of lower PA intervention drop-out among people with MDD (Stubbs, Vancampfort, et al., 2016). However, other research has shown that people with SMI have poor engagement with PA programmes that are provided within MH services (Brand et al., 2016). These conflicting positions suggest that a differentiation ought to be made in relation to PA that is provided in real world clinical settings and PA that is provided through structured and well-resourced interventions, such as with RCTs. Deenik *et al.* (2019) argue that intensive lifestyle interventions, such as RCTs are effective among those that are already seeking behaviour change; but may neglect a majority of the clinical population that would otherwise not engage with an intervention.

In essence, the inherent limitations of intervention research highlighted in the previous paragraph speaks to what has been termed a ‘translational gap’ in the literature, whereby intervention research does not sufficiently impact clinical practice (Deenik et al., 2019; Rebar & Taylor, 2017). Furthermore, there is a dearth of intervention studies which have used PA levels and SB as a primary outcome measure; in relation to SB, there are no studies where SB is a primary outcome measure (Ashdown-Franks et al., 2018). These points raise considerable questions over the translational evidence of many existing and effective PA interventions. Hence, the replicability of findings from many of these effective interventions into other MH settings that may not be politically or environmentally equipped to support such PA remains an uncertainty. This assertion adds to a lack of clarity regarding the factors that may increase PA levels and reduce SB in people with SMI (Ashdown-Franks et al., 2018). The concern around this issue mostly relates to challenges with engagement, but also sustainability of PA programmes. For example, a trial conducted by Firth *et al.* (2018) with people experiencing early stage psychosis showed a significant beneficial effect in relation to Positive and Negative Syndrome Scale (PANNS) scoring from participation in a ten week PA intervention. However, the intervention findings showed that participants had not sustained their levels of PA during a six-month follow-up and had also experienced declines in their MH symptoms concurrently with declines in PA levels post-intervention (Firth, Carney, et al., 2018). The implications from these findings are concerning. They suggest that following the completion of a brief intervention, the subsequent withdrawal of the intervention supports may impact negatively on PA behaviour change and MH state. This again highlights the ‘translational gap’ which has already been alluded to in this section. However, they do not probe the potential harm that may be caused at the individual level from this reversal effect on indicators of clinical recovery.

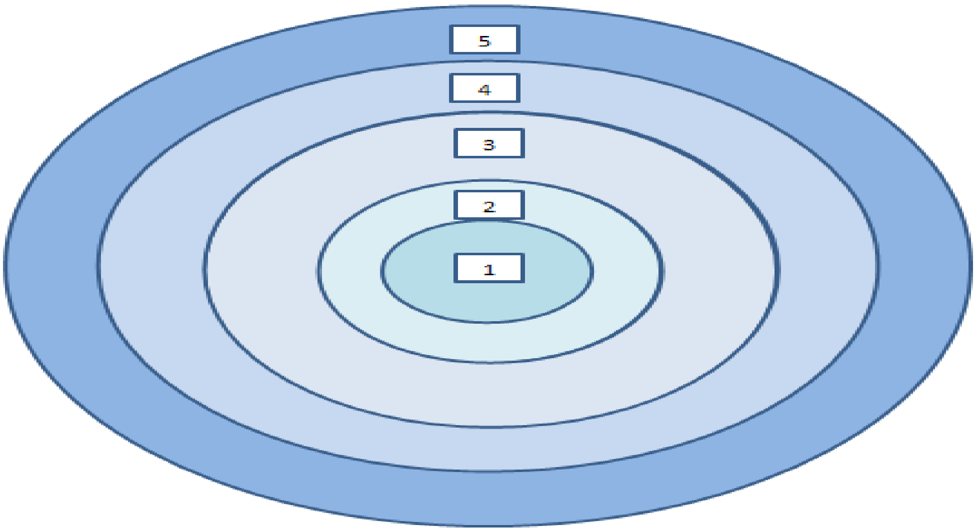
2.4.2 Targeting behaviour change

The studies discussed above pertain specifically to SMI related research, yet, the concept of the translational gap is of course not a concept isolated within populations with SMI (Koorts et al., 2018). As a consequence, a number of theoretical frameworks exist which can be used to inform behaviour change interventions (Michie & Abraham, 2004; Michie, Johnston, Francis, Hardeman, & Eccles, 2008a). The Theoretical Domains Framework (TDF) is an integrated framework that was developed to identify factors that are modifiable in the pursuit of behaviour change (Cane, O’Connor, & Michie, 2012). The TDF has been developed on the back of work which has assimilated component parts of key theoretical frameworks of health behaviour. The TDF has been applied to PA research to identify barriers to PA experienced by those that are inactive (Taylor, Lawton, & Conner, 2013). More recently the TDF has been used with great effect within SMI populations, specifically people with depression (Glowacki, Duncan, Gainforth, & Faulkner, 2017). The TDF is itself not a single theoretical framework, but rather a structured roadmap for identifying modifiable factors which influence behaviour change (Cane et al., 2012). However, while the TDF draws from different theoretical frameworks, its domain areas are seen to align with the Social Ecological Model (SEM), which is a dominant theoretical framework within PA research generally (see Appendix 8, which shows the DPAQ tool determinant areas which represent the TDF). The SEM has been widely applied within general population research to map multilevel influencing factors on PA and their interactions. This multiple layered model is a broad picture which, if compartmentalised, and not used to its full effect, may have negative implications for scale-up of intervention research to reach wider community populations (Koorts et al., 2018; Sallis et al., 2006). The widely recognised SEM has been used in PA epidemiology with particular emphasis on scalable PA. In addition, SEMs have been applied to PA research in SMI populations (Discussed in Section 2.4.3). This research project draws upon the SEM to frame inquiry and shape the interpretation of findings and outcomes throughout. An explanation of the SEM structure and how it is to be applied is discussed in the following paragraphs.

2.4.3 Social Ecological Models of physical activity

The application of the SEM for framing research on PA was initially carried out by Sallis *et al.* (2006). Since then, it has become widely utilised in PA research as a conceptual framework from which researchers can categorise determinants or correlates of PA behaviour. Typically, the SEM is visually represented by a series of nested circles denoting levels of influence on behaviour (see Figure 2-1 below). These levels include the: Intrapersonal, which include factors that are psychological and biological; Interpersonal, which can include social factors of influence; Organisational; Environmental, Community and Policy levels (Richard, Gauvin, & Raine, 2011). In the Figure 2.1 below, a diagram has been generated which is adapted from the SEM outlined in Sallis, Owen, & Fisher (2008). However, for the purpose of this research, the Organisational level and Community level are brought together to form one level termed ‘Organisational and Community’ level. This is done as most people with SMI in rehabilitation and recovery MH services in Ireland are imbedded within MH organisations and groups which are, by their nature community-based (Lavelle et al., 2007). In the context of this research and in other MH research, these two levels are inseparable; hence they are discussed together in the critical review and combine together in the current research. As mentioned, adapting the SEM in this manner is consistent with other research with SMI populations which has examined factors that influence PA behaviour (Vancampfort, Correll, et al., 2013; Vancampfort, Knapen, et al., 2012).

Figure 2-1 A Social Ecological Model



1 = Intrapersonal (biological and psychological); 2 = Interpersonal (social and cultural); 3 = Organisational and community; 4 = Physical environment; 5 = Policy. *This model adapted from* (Sallis et al., 2008)

Looking to the SEM, there are four key principles on which the model operates which the reader should be cognisant of in understanding the analysis of the literature and further primary research in later chapters. These four principles are listed below in bullet point form (Sallis et al., 2008).

- There are multiple levels of factors that influence health behaviour across Intrapersonal, Interpersonal, Organisational/Community and Policy levels. Some factors, such as Sociocultural and Environmental may work across multiple levels.

- Influences can work across levels, often working simultaneously to influence health behaviour.
- Interventions to change behaviour should be structured in such a way as to act across levels.
- SEMs are most effective when they are behaviour specific rather than non-specific and incorporating multiple health behaviours, e.g. PA specific.

In Section 2.4.1.1 (above), the literature is discussed which shows that successful PA interventions in MH populations, have not offered a consensus on a single theory of behaviour/behaviour change that may be used to inform future PA programmes (Ashdown-Franks et al., 2018). While the SEM has already been alluded to as a prominent theoretical framework within this field, there are a number of other different theories that have been used to inform interventions and research in relation to PA for people with SMI. For example the Health Action Approach model has been used to understand the relationship between PA and motivation for people with depression (Krämer, Helmes, Seelig, Fuchs, & Bengel, 2014). The Transtheoretical Model of Change has been applied to examine factors related to weight loss in people with SZ (Klingaman, Viverito, Medoff, Hoffmann, & Goldberg, 2014), and the Self-Determination Theory has been utilised to understand aspects of motivation in affective disorders (Vancampfort, Madou, Moens, et al., 2015).

However, despite the diversity of behavioural theories used in PA epidemiology, there have been criticisms levelled at some of these for focusing only on psychological factors which shape behaviour. The STEPWISE trial (discussed in Section 2.4.1), which is among the largest RCT of PA based interventions for people with SZ, with a sample of 414 people provides a good example of this point. In the trial a comprehensive motivational and educational intervention was implemented, but to no statistically significant effect on PA levels or anthropometry over the course of 12 months follow-up (Holt et al., 2018). The intervention was devised with the support of specific behaviour change theories. These included the Self-regulation theory, Self-efficacy theory and a

Relapse prevention model. None of these theories it seems comprehensively account for factors of influence that are located to the built environment or situated within a policy level, and so may be lacking in their approach. The SEM acknowledges that behaviours such as PA are influenced across a spectrum of levels including the environmental level. In doing so, the SEM comprehensively accounts for factors of influence across all aspects of influence, including factors that may cross levels. The relative newness of applying SEM to SMI research in this manner, should uncover factors of influence that are not well documented in the research to date.

In addition to the strengths of the SEM to account for factors of influence across a broad spectrum of levels, other prominent frameworks such as the Transtheoretical Model of behaviour change and the Social Cognitive Theory traditionally sit within positivist paradigms in PA epidemiological research with the general population (Buchan, Ollis, Thomas, & Baker, 2012). Ecological models of PA are seen to represent a counter narrative to this challenge. For example, ecological models balance the relevance of psychological and environmental influence on behaviour. But moreover, ecological models are flexible in the sense that they are broad and do not seek to explain causal pathways between level factors, but rather indicate the presence of between level influence (Buchan et al., 2012). Again, this fact speaks of a counter-narrative to other widely used theories of behaviour which often fail to reach within social political and environmental levels (Buchan et al., 2012). The concept of PA as a therapeutic resource in MH is one of flux and variability between contexts (Matthews, Cowman, & Denieffe, 2018; Pratt et al., 2016; Rosenbaum et al., 2018). In addition, the policies, social structures and environments within MH care are also in flux, adapting to developments in recovery-orientated care (Cullen & McDaid, 2017; Department of Health and Children, 2006). The exchange between these multilevel issues must be understood in the context of PA programme development; as such the SEM is appropriate to frame the appraisal of the literature and future inquiry within the current research. What is more, this flexibility of the SEM should lend itself to quantitative and qualitative inquiry on the factors that influence PA for people with SMI.

Not surprisingly, the popularity of the SEM in this field is growing. A number of relatively recent review studies have looked to synthesise the literature on the factors that influence PA for people with SMI but by framing inquiry by using the SEM. These reviews have provided a systematic synthesis of correlates of PA for people with SZ (Vancampfort, Knapen, et al., 2012), BPD (Vancampfort et al., 2013), Depression (Azar et al., 2010; Vancampfort, Stubbs, Sienaert, et al., 2015), and recent transdiagnostic cross-sectional study with >3,000 people (Mishu et al., 2018). Additionally, qualitative research with SMI populations seeking to explore environmental factors that may influence weight-gain for inpatients with SMI have also utilised a SEM to frame inquiry (Gorczynski, Faulkner, & Cohn, 2013). Relying on SEMs to frame the findings, these reviews show that factors which influence PA, albeit correlate factors (association rather than causal, explained in next section), occur strongly across the spectrum of levels of influence, including: Interpersonal; Intrapersonal; Environmental; and lastly, the Organisational and Community level. At present there is scant research among the aforementioned systematic reviews to show the presence of strong correlates occurring at the Policy level.

In addition to these review studies discussed in the above paragraph, other review research has examined the transdiagnostic barriers and facilitators to PA across the spectrum of quantitative literature (Firth et al., 2016). Scoping review methods of quantitative and qualitative literature have also been used in this context to investigate barriers and facilitators to PA in MDD (Glowacki et al., 2017). In Glowacki *et al. (2017)*, the Theoretical Domains Framework developed by Cane, O’Connor, & Michie (2012); Michie, Johnston, Francis, Hardeman, & Eccles, (2008) was effectively utilised to investigate barriers and facilitators that occur within psychosocial domain areas of influence on PA.

The SEM aids in the understanding of interaction between groups and individuals within their socio-physical contexts (Sallis et al., 2006). It has previously shown to be advantageous for understanding where barriers and facilitators to PA exist across

Intrapersonal, Interpersonal, Community, Environmental and Policy levels with a view to intervention guidance from a multilevel perspective for communities and general populations (Buchan et al., 2012; Sallis et al., 2006). In general, research has identified that barriers to PA within these domain areas are stronger among less active people compared to those with levels of PA at or in excess of the PA guidelines for health (Taylor, Lawton, & Conner, 2013).

2.4.4 Correlates of physical activity

Correlates of PA are variables which have consistent statistical correlations with PA indicating a strong influencing factor on PA either through cross-sectional and or intervention research. As such, cause—effect relationships that one might examine using RCTs are not always clear from correlate findings (Bauman, Sallis, Dzewaltowski, & Owen, 2002). In the context of ecological models of PA, correlates fall within certain PA domains which are recreation, transportation, occupation and household; with recreation being the predominant contributor to total PA among developed countries (Bauman et al., 2012; Sallis et al., 2006). In applying the SEM to frame the review of literature on the factors that influence PA for people with SMI in this current critical review, correlates of PA are considered to lie within intrapersonal, interpersonal, organisational and community, environmental and policy levels. These correlates indicate factors of influence on PA and are discussed in this section under the heading which represents the levels of the SEM (outlined in Section 2.4.3 and shown Figure 2-1. In the pursuit of understanding PA behaviours, PA correlates show factors that are strongly associated with PA behaviours and are therefore a good start point to show factors that require greater understanding in an effort to effect PA behaviour change (Bauman et al., 2012).

2.4.4.1 Intrapersonal level

In the literature, the intrapersonal level of influence on PA and SMI includes factors that are demographic, biological, behavioural and psychological (Vancampfort, Stubbs, Sienaert, et al., 2015). Firstly, advancing age, as a demographic factor that influences PA appears to be somewhat conflicting in terms of evidence to indicate an influencing role for age. According to some research, there is no conclusive evidence to suggest that advancing age is associated with lower levels of PA in people with SZ and MDD (Vancampfort, Knapen, et al., 2012; Vancampfort, Stubbs, et al., 2015). This is not the case for BPD however (Vancampfort et al., 2013). Not surprisingly, there is mixed reporting between individual studies and their findings on this matter. One study suggests that advancing age can perhaps reflect a time of increased PA among those with a SMI (Lindamer et al., 2008). In this study, 54 participants with SZ were shown to have greater PA levels compared to a younger sample cohort. Undoubtedly, this research is limited by a small sample and what is more, participants in the study by Lindamer *et al.* (2008) were homogenously US military veterans, suggesting that they may be active to some degree during their career, which may have had a lasting impact on their current PA behaviour. However, this counterintuitive finding is, in many respects, not stand-alone. A study which has mapped predictors of adherence to PA for people with depression has shown that advanced age is predictive of good PA intervention adherence (Krogh, Lorentzen, Subhi, & Nordentoft, 2014). These findings make it clear that the evidence is mixed in relation to the influence that age has in this regard and that more investigation into this concept is warranted.

The prevalence of physical comorbidity, particularly cardiometabolic issues for transdiagnostic people with SMI, and their contribution to early mortality has been discussed in Section 2.2.1. A large data research study from the UK, inclusive of >3,000 people with SMI, known as the Lifestyle Health and Wellbeing Survey, has shown that participants with low perception of their health status were also less likely to be engaged in regular PA. Conversely, persons who reported no limiting ailments had 1.39 (95% CI 1.17 -1.66) times greater odds of being more physically active compared to people that self-reported health problems (Mishu et al., 2018). Clear evidence exists to show that the high levels of physical comorbidity experienced by people with SMI is indeed an influencing factor on PA levels. To contextualise this assertion, a meta-analyses by Firth *et al.* (2016), inclusive of over 6,000 transdiagnostic participants with SMI from 12 studies, showed that physical comorbidity was a significant barrier to PA for 25% of people with a SMI (Firth et al., 2016).

While Firth *et al.* (2016) provide a quantitative context for the extent of biological factors, specifically comorbidity which occur within the intrapersonal levels, it is important to note that smaller scale research conducted in Ireland by Cullen & McCann (2014) using qualitative methodologies has not included this same finding as that of Firth and colleagues. However, Cullen & McCann (2014) make reference to excess weight as a barrier to PA (Cullen & McCann, 2014). This point is important as it shows that within the intrapersonal level of the SEM, there are both biological and psychological influencing factors. Between these there are factors that are related, such as weight and comorbidity, but in some cases, they are also separate. In this case, physical comorbidity and excess body weight provide an example of this. For the most part, the evidence showing that comorbidity is a negatively influencing factor on PA for people with SMI is largely accepted.

In addition to the above, the intrapersonal level of the SEM also incorporates a number of psychological factors that are consistently correlated with low levels of PA among SMI populations. First, low mood and depressive symptoms are consistent correlates of PA for people with major and mild to moderate depression and SZ (Azar et al., 2010; Vancampfort, Knapen, et al., 2012; Vancampfort, Stubbs, Sienaert, et al., 2015), but not in BPD (Vancampfort et al., 2013). The strength of the population specific barrier is shown in meta-research by Firth *et al.* (2016) where ‘stress/depression’ was a significant barrier to PA for more than 60% of people with SMI across diagnoses.

A low level of self-efficacy was correlated with low levels of PA in people with depression (Vancampfort, Stubbs, Sienaert, et al., 2015). Similarly, people with SZ and BPD were found to have a higher sense of self efficacy where levels of PA were high among participants (Vancampfort et al., 2013; Vancampfort, Knapen, et al., 2012). Research carried out by Vancampfort, Madou, Moens, et al. (2015) which used a cross-sectional design supports these findings outlined in the opening of this paragraph. The authors found that people with affective disorders may have lower levels of autonomous regulation over their exercise during the early stages of commencing PA. In their research, the authors argue that people with SMI have weaker resilience to sustain PA during the early stages of commencing a new PA behaviour. This pattern is believed to shift as PA is sustained to a long-term behaviour. The concept of autonomous regulation becomes more prominent during sustained PA and as such, motives are seen to shift from external pressures towards more internally regulated PA (Vancampfort, Madou, Moens, et al., 2015). Having beliefs in the benefits of PA and having good intentions to exercise, specifically for people with SZ, are markers of autonomous regulation and are shown to be strong correlates of positive PA behaviour. Worryingly, longitudinal research suggest that motivational and volitional attitudes to PA, specifically PA self-efficacy and positive and negative expectations about PA, which are markers of high and low autonomous regulation, are poorer in SMI populations compared to healthy comparisons (Krämer et al., 2014). The implications of this is that people with SMI may need specifically targeted motivational intervention during the early stage of PA programmes to ensure that autonomous regulation is fostered early. Gender has not been shown as significant in terms of its role as a correlate of PA levels in people with SZ and BPD and MDD (Vancampfort, Knapen, et al., 2012; Vancampfort et al., 2013; Vancampfort, Stubbs, Sienaert, et al., 2015). However, being such a fundamental biological difference. It seems it is nonetheless important for research framed within the SEM to examine this factor in addition to factors such as the level of autonomous PA regulation where inquiry with respect to understanding the influences on PA is a research aim. In this research, this relates to one of the underlying objectives, as this understanding is pertinent to take forward to co-design elements of the EBCD approach.

2.4.4.2 Interpersonal level

The interpersonal level within the SEM includes cultural and social factors which influence PA behaviour (Sallis et al., 2008). In this regard, the interpersonal deals with the interactions and influence that one receives from other individuals where interaction occurs. Within the PA and SMI research, the factors that influence PA at the interpersonal level predominantly relate to different types of social support received from the individual’s support network (Gross, Vancampfort, Stubbs, & Soundy, 2015). However, research has shown that only a small number of studies have examined the role of perceived low level of social support and its association with low levels of PA in SZ and BPD respectively (Vancampfort, Correll, et al., 2013; Vancampfort, Knapen, et al., 2012). More recently, a global transdiagnostic meta-analyses has shown that roughly half of people with SMI find ‘lack of support’ to be a barrier to PA intervention participation, meaning a lack of a sufficient support network to draw upon for PA motivation (Firth et al., 2016). While this lack of social support clearly inhibits PA participation for people with SMI, research also shows that increased social support in the form of persistent encouragement from family and peers is associated with increased PA levels (Aschbrenner, Mueser, Bartels, & Pratt, 2013). Aschbrenner and colleagues conducted cross-sectional research during baseline measurement for the In SHAPE trial which is a lifestyle intervention for people with SMI (n=158). Their research participants’ experience of face-to-face interactions with family were reported on and classified as either positive or negative. Their findings, while limited by a cross-sectional design, showed 80% of participants reported regular positive face-to-face contact with a family member or friend. This research provides a good indication of the clinical relevance of establishing and sustaining strong social networks with family and peers during PA. Once again, these are findings from an intervention and may not directly translate to clinical practice. Qualitative research shows that people with SMI have found that interventions that have included opportunities for social interaction, training partnership formation, and having knowledgeable and encouraging staff to lead programmes, can all play an enabling role for PA (Soundy, Kingstone, & Coffee, 2012).

Emerging evidence has explored the role of Peer-Support Workers (PSWs) in PA programmes for people with SMI (Stubbs, Williams, Shannon, Gaughran, & Craig, 2016). While this area of research is still in its infancy, there is emerging evidence to show that peer-supported interventions are feasible and acceptable, in addition to demonstrating beneficial clinical outcomes of effect in MH setting (O’Hara, Stefancic, &

Cabassa, 2017). O’Hara and colleagues implemented a RCT where PSWs received six hours of training. Following this, their duties involved preparing and delivering weekly lifestyle balance interventions, including a focus on PA for 12 weeks. This approach may have beneficial implications for clinical practice in addressing deficits in social support for people at the interpersonal level and should be explored in future research.

Previously discussed research by Firth *et al.* (2016) shows that there is heterogeneity among people with SMI in relation to their perceived value of social support in PA. While there is a body of qualitative evidence exploring the role of social support and PA for SMI (See Section 2.5), there appears room for qualitative research to learn about specific aspects of social support in gaps highlighted in this section. For example, the role of social support in non-intervention research and the role of emerging MH professionals like PSWs. In addition, there appears value in exploring the experiences of people with SMI who have received sufficient support with PA and similarly those in poorly resourced (in relation to PA) MH settings, which is a factor within the physical environment level of the SEM. This last point exemplifies how there may be between-level interactions in the factors that influence PA for people with SMI.

2.4.4.3 Organisational and Community level

The organisational and community level of the SEM includes factors of influences that arise out of cultural and social norms which influence behaviour. In the context of MH facilities, the space between the community level and the organisational is closely interlinked as the vast majority of people in rehabilitation and recovery MH services reside in residential facilities where recreation is also provided. In the rehabilitation and recovery context, these facilities are also community-based (Lavelle et al., 2007), and so both of these levels are in a sense connected.

In looking to the factors that occur at this level that influence PA for people with SMI, it seems such factors are not well documented within quantitative research. However, there is some qualitative research which has explored community and organisational level influences on PA that are useful for indicating experiences of people with SMI around these factors. For instance, Raine, Truman, & Southerst, (2002) carried out an evaluation of a community-based PA programme for MH service users. Participants in the evaluation described that activities that are socially valued are important to people with SMI in sustaining PA (Raine et al., 2002). The findings of Raine, Truman, & Southerst, (2002) are in many ways echoed by other qualitative research that was grounded in the SEM (Gorczynski et al., 2013). Here, eighteen people with SMI in a Canadian MH centre participated in research which sought to explore the influence of the built environment on PA for people with SMI. While this study speaks to the SEM level of the physical environment, the findings of this study also showed that participants living within the MH centre facility reported frequent boredom and sedentary routines as the norm within the MH centre. This structured setting where service users reside, seek recreational activities, and have social interactions are undoubtedly an influence on behaviour due to the ingrained cultural norms which will become established.

Qualitative research has outlined the phenomena of meta-perceptual bias among people with SZ (Soundy, Faulkner, & Taylor, 2007; Soundy et al., 2014). That is the individual who has negative perceptions regarding what others think about them. In this instance, the phenomena have a profoundly negative impact on a person's participation in PA, particularly where exercise facilities are for public use. This point has relevance where a growing amount of qualitative research has reported on environmental factors that influence PA for people with SMI. For examples, research from Ireland, which endeavoured to explore PA experiences of people with SMI, has shown that people with SMI that are in treatment can experience anxiety from participating in PA that is not located within the MH services facility (Cullen & McCann, 2014). While admittedly from a small sample of just ten participants, this research speaks to the value of contextualising quantitative research using additional qualitative methods for exploring community and physical environment level factors which appear to move between levels in some instance.

2.4.4.4 Physical environment level

The most recent review of correlate research using a SEM to examine where factors that influence PA for people with SMI occur have shown no consistent correlates of PA behaviour that are situated within the physical environment level (Vancampfort, Knapen, et al., 2012; Vancampfort, Stubbs, et al., 2015, Vancampfort, Correll, et al., 2013). Despite review studies pointing towards a research deficit, there is some evidence which suggests that the deficits in the literature, or rather, lack of literature, may obscure the knowledge on the importance of factors of influence on PA that occur at the physical environment level. For instance, a cross-sectional study of 123 inpatients and outpatients with SZ in Belgium showed that environmental variables explained a significant variance in walking behaviour among people with SZ (Vancampfort, De Hert, De Herdt, et al., 2013). Using the Assessing the Levels of Physical Activity Environment Questionnaire, participants were asked about a plethora of environmental factors which may impact on their level of PA. The findings showed that prolonged sitting time was associated with reduced availability of local infrastructure for PA, such as nearby bike lanes and walkways. In addition, sitting time was associated with perceptions of criminality in the locality, perceived aesthetics of the local environment and the availability of home exercise equipment (Vancampfort, De Hert, De Herdt, et al., 2013). While the study reported here is cross-sectional in nature, it provides interesting insight into factors which have not been well addressed and considered within intervention research to assess the extent of causal influence (Firth et al., 2015).

As previously discussed (Section 2.3.9), there are significant differences in PA levels between inpatient and outpatients with SMI in many international contexts. For the most part, it seems inpatients achieve higher amounts of MVPA compared to outpatients (Vancampfort, Firth, et al., 2017), because the provision of structured PA sessions that are provided by MH services (Fraser, Chapman, Brown, Whiteford, & Burton, 2015b). However, there is no comprehensive Irish research to examine this phenomenon in a context where PA policy has been deficient in recent years (Discussed further in Policy section). Regardless of inpatient services capacity to facilitate PA, cross-sectional research has indicated that a considerable amount (50% of n=151) of people with SMI in the UK choose their home as the preferred location of engaging with PA (Ussher, Stanbury, Cheeseman, & Faulkner, 2007). This finding is explained further by qualitative research carried out with 51 people with SMI in a secure setting. It seems that the inpatient environment is often perceived by MH service users as characteristically restrictive and regulated, and thus disempowering as an environment in which one can become or maintain active (Every-Palmer, Huthwaite, Elmslie, Grant, & Romans, 2018). There is also quantitative literature showing that people with SZ report lack of facilities to walk and be active, and poor transportation opportunities as barriers to their PA (Klingaman et al., 2014). This study is based in the USA and is only inclusive of veterans with psychotic illness and therefore, it is possible that the findings do not relate directly with European settings such as Ireland. It has been hypothesised that many people with SZ, who appear to get much of their PA through walking, do so in the pursuit of recreational walking, as opposed to PA for transport. In the context of findings from Vancampfort, De Hert, De Herdt, *et al.* (2013), participants living in more rural setting are shown to have comparatively higher levels of walking to urban dwellers.

Meta-research on the facilitators and barriers of PA for people with SMI indicate that barriers to PA specifically relating to the environmental level of the ecological model are not prominent in the literature (Farholm & Sørensen, 2016; Firth et al., 2016). It seems barriers and facilitators of a psychosocial nature appear more prominent in the literature. While it is unclear as to why this may be the case, such a phenomena has been discussed previously in relation to the general population, so perhaps does not come as any great surprise to the reader, but indicates a need for further exploration.

2.4.4.5 Policy level

Despite the mounting evidence base for the use of PA for improving physical and mental health of people with SMI, policy has, until now, remained slow to incorporate PA as a frontline treatment (Murri et al., 2019). For instance, in treating depression, where the most robust evidence lies, exercise interventions have routinely been recommended as frontline treatment in mild depression, but considered ‘alternative’ in the treatment of MDD (Ravindran et al., 2016). However, recent accelerations of research in the field appear to be having an impact on practice. A recent review of the literature was carried out on behalf of the European Psychiatric Association (EPA) by Stubbs *et al.* (2018). The findings of this review appear to have advanced the trajectory of international MH policy towards PA having a role as a primary therapeutic resource for certain diagnoses of SMI in some developed countries (Stubbs et al., 2018).

Despite this, there is considerable variance between international policies regarding guidance on PA and SB for MH settings. In some contexts, there is longstanding policy which has made PA a primary therapeutic resource for services. In Australia, policy has adapted to integrate accredited exercise professionals as part of multidisciplinary MH teams (Lederman et al., 2017). Such professionals (accredited exercise physiologists) have the capacity to supervise and programme tailored PA, implement behaviour change interventions, and have knowledge on psychiatric disorders akin to other allied health care professionals (Lederman et al., 2016). Trial-based research with people with SZ, using one to one and group exercise delivered by exercise professionals albeit as part of multidisciplinary intervention, have demonstrated that success in increasing PA levels, engaging behaviour change techniques, and sustaining PA behaviour change over a one year period (Curtis et al., 2016, 2018). These findings demonstrate the value of integrated approaches to PA in MH setting that are rooted in policy which brings with it, regulation from authority bodies such Exercise and Sports Science Australia (Lederman et al. 2016).

In Ireland, the national MH services have historically not incorporated PA or exercise into policy documents that guide services (Matthews, Cowman, & Denieffe, 2018). For instance, the national policy framework in Ireland, which put forward plans to re-structure MH service towards recovery focused service provision, *A Vision for Change* (AVFC) (Department of Health and Children, 2006), neglected to include PA as either a primary or alternative strategy for services to adopt (Matthews, Cowman, & Denieffe, 2018).

More recently, responding to the deficits with regard to policy on PA and SB, the national MH services commissioned work on a strategy document for services called *Let's Get Active* (Broderick & Moran, 2018). This document provides advice and education existing MH service providers to support service users in becoming physically active. The *Let's Get Active* guidelines are undoubtedly a welcome resource in the context of what was a policy vacuum in relation to guidance prior to their development. However, there is currently no known literature on the impact or effect these guidelines have in relation to practice in Ireland.

It could be argued that the '*Let's Get Active'* document does not go far enough to comprehensively meet the changing dynamic of contemporary MH care in Ireland. For instance, the principles put forward in the National Recovery Framework for Ireland advocate that patient and service user inclusion must go beyond mere consultation (Health Service Executive, 2018). In the '*Let's Get Active'* document, Broderick & Moran (2018) indicate that data informing the resource were taken from service user focus groups. In addition, only one service user was a member of the working group which developed the resulting policy guidelines document. It is argued here that patient or service user inclusion should go beyond this level of consultation, but rather a shift of power and ownership must be inherent within the process as per guidelines of patient inclusion in the NHS (Millar, Chambers, & Giles, 2015). This concept of patient inclusion is discussed in more detail later in Section 2.6.1.

There has been an absence of policy guidelines from the national MH services for key stakeholders to follow up until the development of the *Let's Get Active* document. There has been some impetus for Irish MH services to provide PA even without guidance. The Mental Health Commission (MHC) which serve as the national watchdog for safeguarding standards of practice in Irish MH care have existing regulatory standards in relation to PA which approved centres (MH facilities) must meet. For instance, *Regulation 9 on 'Recreational activities'* and *Regulation 16 on 'Therapeutic programmes'* set out standards that MH services must meet in their care planning and service delivery (MHC, 2018). The details included in Regulation 9, which is the most relevant in context are shown in Table 2-1 below.

Table 2-1 The Mental Health Commission's standards for PA in Irish mental health services

Regulation	Purpose	Evidence of implementation
Regulation 9 ***Recreational Activities***	'Residents' (Supported residential facility) are provided, where possible activities that are beneficial, enjoyable and improve QOL within the approved centre.	• The A/C provides appropriate R/A for the group profile. • R/A for weekdays and weekends. • Information is provided to individuals regarding available R/A. • R/A programmes are developed, implemented, and maintained with SU involvement. • Individual risk assessment carried out for each SU in relation to chosen R/As. • R/A are appropriately resourced. • Indoor and outdoor exercise available. • Documented attendance for clinical records.
A/C = Approved centre (Supported residential facility); R/A = Recreational activities; QOL = Quality of Life		

This impetus provided by MHC regulations are however, not stand-alone. More broadly, the national public health policy document, *Healthy Ireland,* is a Government of Ireland initiative with the intention to improve lifestyle-related health behaviour across all levels of society in Ireland. The Healthy Ireland Framework encompasses a number of different strategies with goals for reducing health inequalities in Irish society; of particular relevance here is the National Physical Activity Plan (Department of Health, 2016). This is a governmental strategy and commitment to increase PA levels and reduce SB of individuals across Irish society, highlighting at risk cohorts and pathways on which these groups may be supported to increase their PA. The National Physical Activity plan uses the NPAG of 30 minutes a day, MPA on at least five days a week or 150 minutes as a benchmark of adequate PA across Irish society. The National Physical Activity Plan centres on principles that are drawn from WHO strategy to target vulnerable population subgroups through evidence-based strategies; advocating for multilevel strategies on which PA may be implemented. Furthermore, this plan advocates for cross-sectoral approaches to implementation that includes multi-agencies where possible. The National Physical Activity Plan is a further impetus for national PA bodies such as *Get Ireland Walking* to incorporate health services in-reach within their strategy and policy (Get Ireland Walking, 2017). This broad level of policy indicates that PA and SB intervention in Irish MH services did not occur in a policy vacuum, but rather were likely loosely driven by oversight recommendation and policy with poor structural guidance on how best to enact policy.

Previous writings on the SEM have shown the need to further understand the interplay between factors that occur within different levels of the SEM (Buchan et al., 2012). Based on the literature discussed in the previous paragraphs, there appears a need for more in-depth qualitative literature in this field to better understand gaps discussed, such as the interplay between certain ecological levels, and the deficits in literature on the SEM levels of the Physical environment, Organisational and community, and Policy (Soundy et al., 2014). It is in these areas that qualitative research has strengths. Qualitative research that has mined the experiences of PA of people with SMI has reported factors of influence on PA that do not always consistently overlap with statistically significant correlates of PA within the quantitative literature (Faulkner & Carless, 2006). In the next section of this critical review (2.5), an examination of the qualitative literature in relation to the experiences of PA and SMI is discussed in more detail.

The previous paragraphs have illustrated that there are a number of theoretical frameworks that have been used to examine PA behaviours in SMI population previously. However, there are a number of particular strengths to the SEM, such as its adaptability and broadness which have no doubt contributed to its increasing proliferation of the literature as a suitable and effective framework for inquiry into PA behaviours in SMI populations. In this regard, the SEM has been adopted across this research study to shape and guide the inquiry across the aforementioned levels. Further to this, existing reviews of the relevant literature that have applied a SEM framework previously have not found consistent correlations between PA levels and correlates of PA that occur at the policy level. This may indicate that factors of influence at this level act in a somewhat benign manner, or that research studies on factors that influence PA are lacking in their undertaking (Vancampfort, Knapen, et al., 2012; Vancampfort, Stubbs, et al., 2015). That said, research has shown that correlates of PA in other clinical populations are also inconclusive in the pursuit of identifying correlates that influence PA at a policy level (Petter, Blanchard, Kemp, Mazoff, & Ferrier, 2009). In both SMI and non-SMI populations, it has been argued that greater depth of qualitative work is required to unearth the role that policy has in influencing PA and SB among such clinical populations (Petter et al., 2009; Vancampfort et al., 2013). Using the SEM to frame inquiry, there appears justification for research to explore factors that influence PA to provide understanding on factors across the spectrum of levels, including at less well understood levels such as policy which influence PA for people with SMI. At present, there is also no research from an Irish context that has examined factors of influence on PA either quantitatively or qualitatively indicating a need to address this exploratory research that can unearth contextual issues for an Irish population.

2.5 A rationale for reviewing qualitative research on physical activity and SMI

Previous sections of this review have discussed quantitative, theory driven research on the factors that influence PA and SB for people with SMI. These research studies are by their nature, within positivist theoretical positions. While this is relevant and valuable for informing PA interventions, it also has limitations with regard to developing PA interventions, where translational issues between effective PA implementation in real world treatment settings exists (Rebar & Taylor, 2017). The majority of research discussed in Section 2.4 provides broad insights into factors that may influence PA, but also speak to the fallibility of positivist research in this area where experiences of mental illness symptomology and PA will differ between individuals and contexts (Faulkner &

Carless, 2006). Within theoretical frameworks that have been applied to SMI populations, there are influencing factors, such as factors relating to emotion, which are not well represented within theories of behaviour change, but appear to be particularly relevant in the context of motivation and SMI (Rebar & Taylor, 2017). Within these gaps, qualitative research is well placed to explore these issues more deeply.

The review discussed in Section 2.4 by Firth *et al.* (2016), which synthesised quantitative literature on barriers and facilitators to PA for people with SMI specifically focused on quantitative literature, as with other research of this nature. This approach has some limitations in terms of its translation impact due to the lack of comprehensive understanding of nuanced experiences which are captured in certain qualitative research studies in this area. To the authors knowledge, there are four existing review studies which have captured qualitative research on factors that influence PA for people with SMI (Roberts and Bailey, 2011; Mason and Holt, 2012; Soundy et al., 2014; Glowacki et al., 2017). These reviews provide valuable insight into specific areas of the qualitative research on the experiences of PA and SMI. However, there are considerable limitations within the applicability of these review studies in the context of this current doctoral research aim and objectives. Therefore, there appears a need for an updated review of qualitative literature on the factors that influence PA for people with SMI. The specific limitation of these reviews with regard to the current research study will be discussed in the paragraphs immediately below.

The review conducted by Roberts & Bailey, (2011), which looked at the incentives and barriers to lifestyle interventions across qualitative and quantitative literature is in many respects, limited in its capacity to inform this current research project. First the authors of this paper use a narrative synthesis methodology to review quantitative and qualitative research with regard to ‘lifestyle’ interventions for people with SMI. This, combined with the relative age of the published article, limits the applicability of the findings from this review. Roberts & Bailey, (2011) included just three qualitative research studies in their review. Their findings illustrated a number of mental illness symptomology related barriers to PA. In addition to barriers to PA, a number of PA incentives or facilitators were identified within the research. Prominent examples of these included the use of group-based PA, and close participation from MH service providers (Roberts & Bailey, 2011). However, this review did not include research that had explored the views of MH service providers and as such is further limited in the translation of evidence for the current research project.

Mason and Holt (2012) included thirteen published articles in their review of qualitative research of PA interventions for people with SMI. In the context of this current research project, this review by Mason and Holt is beneficial as it informs readers of key themes that arise within transdiagnostic literature, as per the focus of this current research. Themes within Mason and Holt (2012), include the importance of a service user feeling safe during PA and the importance of social interaction during PA. However, there are a number of limitations within this review in the context of the current research and therefore support further work in this area. First, in the context of a rapidly developing research area, the age of this review is also limiting with respect to informing current research. In addition, Mason and Holt (2012), set specific criteria to include studies that have carried out qualitative research on PA interventions only. In doing so, this research excludes non-intervention qualitative research. It could be argued that taking this approach has considerable limitations in the context of service level translation of evidence (Deenik et al., 2019). The development of PA where no new resources or facilities are in place to develop a PA programme may pose different challenges across ecological levels of intrapersonal, interpersonal, physical environment, organisational and community, and policy levels. For instance, qualitative research with 33 people with depression has previously discussed personal challenges that participants with SMI have faced in sustaining a PA intervention beyond the structured PA sessions provided through an intervention (Searle et al., 2011). In case of research by Searle *et al. (2011)*, the withdrawal of social interactions appear to have had a meaningful negative impact on PA engagement. Mason and Holt (2012) also take a transdiagnostic approach to their review. In doing this, they provide insights across a spectrum of psychiatric disorders that can influence future research. Something which should be considered in future reviews of the evidence. Their findings show six key themes across the literature which are:

- An opportunity for social interaction and support through PA
- A sense of meaning and purpose from PA
- The role of facilitating personnel in supporting PA
- Feeling safe as a facilitator to PA
- Improved symptoms from engaging in PA
- Identity through PA engagement

The third review listed which looked at qualitative studies of PA and SMI was by Soundy *et al.* (2014). Here eleven published articles and one study (Faulkner & Sparkes, 1999), that was included in the work of Mason and Holt, (2012), were included. The remaining studies (Fogarty & Happell, 2005; Gorczynski et al., 2013; Happell, Scott, Platania-phung, & Nankivell, 2012; Hedlund & Gyllensten, 2013; Johnstone, Nicol, Donaghy, & Lawrie, 2009; Leutwyler, Hubbard, Jeste, & Vinogradov, 2012; Roberts & Bailey, 2013; Sandel, 1982; Weissman, Moot, & Essock, 2006), offer a more up-to-date account of experiences of PA for people with SMI relative others already discussed. However, this literature synthesis is limited on account of diagnostic specificity, focusing on SZ and psychotic illness alone. Nonetheless, the work of Soundy *et al.* (2014) is strengthened by its inclusion of research that has included service provider participants, thus encompassing the multi-stakeholder perspective of experiences inherent within taking part in PA or reducing SB in MH settings. Soundy *et al.* (2014) show three overarching themes in the literature, which are:

- The influence of individuals and their environment upon PA
- Access and barriers to participation in PA
- The benefits of engaging in PA

The last review is again diagnostic specific, but this time focusing on depression (Glowacki et al., 2017). A scoping review methodology was employed to examine 13 studies (6 qualitative) which reported on barriers and facilitators to PA within TDF domain areas among people with depression. The qualitative findings demonstrated a number of psychosocial barriers, such as low self-confidence, amotivation, and lack of resources for PA which are prevalent among people with depression. Similarly, a range of facilitators were identified across the same domains where barriers were identified. Participants explored the value of autonomy in PA, individualised/tailored PA programmes, structure and safe locations for exercise, were all discussed in the context of facilitators to PA for people with depression (Glowacki et al., 2017).

2.5.1 A need for multidisciplinary inclusion in qualitative research

Across the reviews discussed in the previous section, only one study included the MH service provider, yet recovery focused MH paradigms which proliferates practice continue to advocate for multidisciplinary working (Lavelle et al., 2007). This concept has been extended to PA programmes within MH practice (Vancampfort & Faulkner, 2014), and intervention/ trial research (Vera-Garcia, Mayoral-Cleries, Vancampfort, Stubbs, & Cuesta-Vargas, 2015). The review by Mason and Holt (2012) does not investigate a multi-stakeholder perspective of qualitative research, and is therefore not portraying all the relevant detail of the evidence required to inform this current research project. Previous research studies have noted differences in perspectives between MH service providers and service users in previous research on health promotion for persons with SMI (Verhaeghe, De Maeseneer, Maes, Van Heeringen, & Annemans, 2011). In this example, MH nurses were shown to prioritise operational and procedural challenges as barriers to lifestyle change. Conversely, service users, not surprisingly, prioritise intrapersonal level factors of influence such as physical comorbidity.

The four reviews already discussed (Roberts and Bailey, 2011; Mason and Holt, 2012; Soundy et al., 2014; Glowacki et al., 2017), show considerable heterogeneity between included studies, which provides unique and at times, conflicting findings between review studies. The heterogeneity between these reviews has undoubtedly contributed to the heterogeneity between key themes identified between reviews. Based on careful consideration of these reviews, it seems evident that there is a need for up-to-date synthesis of transdiagnostic literature with regard to PA and SB experiences within MH settings. Therefore, a review of the qualitative literature is discussed in the subsequent section. This review explores experiences of PA from people with SMI and those who provide care in relation PA, exercise or SB.

2.5.2 Review of the qualitative research on physical activity and SMI

2.5.2.1 Qualitative review aim

In this section, a review of the qualitative evidence has been carried out which had the aim to bring together and provide an update of the qualitative research on the experiences of PA within MH treatment contexts from a multi-stakeholder perspective.

2.5.2.2 Qualitative review method

Building on the existing critical review approach, data-bases were searched for primary qualitative evidence, and Boolean operators (‘AND’ ‘OR’ and ‘NOT’) were applied to predetermined search words to refine the specific search process. The population terms applied included: “serious mental illness” OR “severe mental illness” OR “common mental disorder” OR “common mental illness” OR “schizophrenia” OR “psychosis” OR “psychotic” OR “major depression” OR “depression” OR “bipolar”. The behaviour terms included: “physical activity” OR “exercise” OR “sedentary behaviour” OR “sedentary behaviour” OR “steps” OR “sport” OR “walking”. The topic terms included: “Qualitative” OR “experiences” OR “phenomenology” OR “thematic” OR “grounded theory” “discourse analysis”.

Databases: Science Direct (N=460), CINAHL (N=83), PubMed (N= 585), Wiley Online (N=28) PsychINFO (N=621*)* were searched with the above terms. Following 71 full text retrievals, twenty studies were included after duplicate and exclusionary filtering were applied and hand searching of included articles reference lists were undertaken. A number of inclusionary and exclusionary criteria were applied. Articles were eligible for inclusion if: (a) included the views, perceptions or experiences of people with diagnosed SMI (ICD-10 or DSM –V) or MDD, BPD, schizophrenia type disorder and/or mental health service providers, carers or Peer Support Workers (PSW) involved in care for SMI; (b) published in the English language. Studies were excluded if: (a) >50% of the sample had a primary diagnosis of substance misuse disorders, eating disorder, anxiety or stress related disorder; (b) >50% of the sample were from a secure or forensic mental health setting; (c) involving sample with <18 years of age; (d) published prior to the year 2000; (e) review articles; (f) if two or more studies used the same data-set, here the author selected the study with the most relevant content; (f) studies that were reported in conference proceedings, thesis, or summarised in a book; (g) studies that did not primarily focus on PA; (h) studies that were mixed methods/quantitative; (i) studies were Asian, African and or South American in their origin. This final exclusionary criteria (j) was utilised so that the review would be specifically relevant to western MH settings. A summary of the included study characteristics can be seen in the *Results of qualitative review* section and Table 2-2. In this section of the critical review and in keeping with the wider current research project, the SEM (Sallis et al., 2008) has been applied throughout as the theoretical framework from which inquiry and synthesis are structured. The broad levels of the SEM are therefore used to synthesise and discuss the finding of the qualitative research included here.

2.5.3 Results of critical review of qualitative research on PA and SMI

Following searches of the literature, 20 studies met the criteria for inclusion of this review. Six studies focused on the views of MH service providers alone or along with service users. Most of the included studies specifically focused on diagnoses of SZ. Table

2-2 shown below provides a description of studies included in this review of the qualitative research.

Table 2-2 Study characteristics: qualitative research of the factors that influence physical activity and SMI

Source/Paper	Sample description	Data collection and schedule	Location of data collection	Specific topic cover in study	Theoretical framework/Research Paradigm Method of analysis	Included in prior review
Cullen and McCann (2014)	(N=10) SMI	Semi structured interviews	Outpatients (Ireland)	To explore the role of physical activity for people in Ireland who experience SMI.	Exploratory -qualitative Content analysis (Not specified)	No
Glover *et al.* (2013)	(N=31) SMI	Semi structured interviews	Psychiatric rehabilitation centre	Investigate barriers to exercise for people with SMI	(Atlas.ti software) Inductive thematic analysis	No
Gorczynski, Faulkner sand Cohn, (2013)	(N=25) SZ	Interviews Photograph autography	Centre for addiction and mental health (Canada)	Explore environmental factors of influence on PA and diet for people with schizophrenia	Social Ecological Model (Angelo Framework) Thematic content analysis (Braun & Clarke, 2006)	(Soundy *et al.*, 2014)
Hargreaves, Lucock and Rodriguez (2017)	(N=8) Schizophrenia and/or BPD	Semi structured interviews	Persons in ‘recovery’ (UK)	To explore individual experiences of PA and uncover the behaviour change processes of PA in people with SMI in recovery	Phenomenology underpinned Content analysis	No

Hodgson, McCulloch and Fox (2011)	(N=17) SZ	One to one Interviews	Attendees of secondary MH services in local NHS trust (UK)	To determine the perceived effects of PA participation on mental well-being, social well-being and physical well-being	Predetermined themes Thematic analysis (Braun & Clarke, 2006)	No
Ho, Dahle and Noordsy (2018)	(N=23) SZ	Semi structured interviews	Outpatients (USA)	Explore factors motivating independent in population with schizophrenia	Modified content analysis Numerical conversions	No
Huck et al. (2018)	(N=18) SMI	Focus groups	Community treatment	To identify strategies for encouraging greater levels of physical activity among community-dwelling individuals living with serious mental illness	Health behaviour theory Consensual qualitative research methods	No
Johnstone *et al.*, (2009)	(N=27) SZ	Semi structured interviews	Community treatment (Scotland)	To explore/investigate barriers to PA in community settings	Interpretive Phenomenological Analysis	(Soundy *et al.*, 2014)
Leutwyler *et al.*, (2014)	(N=16) SZ (Older adults)	In-depth focus groups Semi structured interviews	Transitional day centre Locked residential facility Intensive case management programme	Exploration of perceptions about barriers and facilitators to PA in older adults with schizophrenia	Grounded theory (Atlas.ti software)	(Soundy *et al.*, 2014)

Mcdevitt *et al.* (2006)	(N=34) SMI	Focus groups	Community-based outpatient rehabilitation centres (USA)	Explore factors affecting PA in community outpatient MH services	Iterative thematic coding process	(Roberts & Bailey, 2011)
Rastad, Martin and Åsenlof (2014)	(N=20) Schizophrenia/ Schizo-affective disorder	Semi structured interviews	Outpatient clinic (Sweden)	Explore perception and experience of barriers to and incentives for physical activity in daily living in patients with schizophrenia	Exploratory study Content analysis	No
Soundy, Faulkner and Taylor (2007)	(N=16) SMI	Semi structured interview	Outpatient /community setting (UK)	Detail description of lifestyle PA habits of individuals with SMI that are outpatient; experiences and perceived importance of behaviour	Thematic analysis	No
Weissman, Moot and Essock (2006)	(N=23) SZ	Focus groups	Veteran medical affairs centre (USA)	Explore perspectives of weight management in people with schizophrenia	None detailed	(Soundy *et al.*, 2014)
Wright *et al.* (2012)	(N=25) BPD	Interviews (Telephone)	Third sector mental health organisations (UK)	Focus on experiences and issues associated with exercise and BPD	Interpretive Phenomenological Analysis	(Glowacki et al., 2017)
Studies with service provider inclusion						

Carlbo, Claesson and Åström (2018)	(N=12) MH Nurses	Focus groups	Outpatient/inpatient hospital (Sweden)	To describe nurses' experience, including personal motivation, in using physical activity as complementary treatment in patients with schizophrenia.	Content analysis	No
Faulkner, Gorczynski and Cohn (2009)	(N=25) 'Key stakeholders' (Recreation therapists, Nurses, Food service supervisors, Dieticians, Psychiatrist, Programme administrators)	Semi structured interviews	Centre for addiction and mental health – inpatient unit (Canada)	To identify modifiable environmental factors that might influence weight management of inpatients	Social Ecological Model (Angelo Framework) Grounded theory	No
Happell, Scott, Platania-phung, *et al.* (2012)	(N=38) Mental health nurses	Focus groups	Community and acute inpatient settings (Australia)	Views of nurses on PA for people with SMI	Thematic analysis (Braun & Clarke, 2006)	(Soundy *et al.*, 2014)
Hedlund and Gyllensten (2013)	(N=8) physiotherapists	Semi structured interviews	Outpatient MH (Sweden)	Explore physiotherapists use and experience of body awareness training	Content analysis	(Soundy *et al.*, 2014)

Leutwyler *et al.* (2012)	(N=23) Mental health service providers (Nurses, Social workers, Rehabilitation workers, Programme workers, Programme director, Counsellors, Programme director)	Semi structured Interviews	Transitional day centre Locked residential facility Intensive case management programme	The perceptions of mental health service providers on the barriers and facilitators of PA for individuals with schizophrenia	Grounded theory Constant comparison analysis	(Soundy *et al.*, 2014)
Leyland *et al.* (2018)	(N=32) MH care professionals	Focus groups	Community MH teams (North East England)	To use Theory of Planned Behaviour to identify the beliefs of MH professionals working in community settings in relation to motivation for advising health-related physical activity.	Theory of planned behaviour Content analysis	No

This extension of the critical review to qualitative research has demonstrated a number of salient themes across the literature: Bio-psychosocial benefit of PA; Barriers to Physical activity; Social Support; Strategies to be more active. Each of these themes and the studies from which they have been found is shown Table 2-3 below. These themes will now be discussed individually in the subsequent section. In addition, the themes discussed in this section of the critical review will help inform the direction of the Study 1 of this current research with respect to barriers and facilitators of PA that have been explored previously. However, this review of the qualitative research is of upmost importance in guiding methodological decision taken for Study 2 of this research which is qualitative in nature.

Table 2-3. Key themes identified in included qualitative studies

Theme	Subtheme	Social ecological levels of influence	Articles
Bio-psychosocial benefit of PA and reducing SB	PA provides stability, normality and routine; PA is distraction and replacement resource for negative thought/ rumination	Intrapersonal	(Cullen & McCann, 2014); (Hargreaves et al., 2017); (Hodgson et al., 2011); (Wright et al., 2012)
	PA can relieve stress, improve mood, reduce positive symptoms	Intrapersonal	(Cullen & McCann, 2014); (Ho et al., 2018); (Hargreaves et al., 2017); (Wright et al., 2012); (Leyland et al., 2018); (Soundy et al., 2007)
	PA can improve quality/enjoyment of life, New PA allows learning new skills, provides meaningful activity and supports recovery.	Intrapersonal	(Cullen & McCann, 2014); (Hargreaves et al., 2017); (Hodgson et al., 2011); (Leutwyler et al., 2014)
	PA improves physical health, sleeping, self-care, weight –loss	Intrapersonal	(Ho et al., 2018); (Hargreaves et al., 2017); (Weissman et al., 2006); (Happell, Scott, Platania-phung, et al., 2012)
Barriers to physical activity	PA is influenced by Stigma	Intrapersonal Interpersonal	(Gorczynski et al., 2013); (Happell, Scott, Platania-phung, et al., 2012); (Soundy et al., 2007)
	PA is influenced by psychiatric illness symptomology and associated effects (e.g. weight gain) and behaviours (e.g. social withdrawal), and problems allied to treatment (e.g. diagnostic overshadowing)	Intrapersonal	(Rastad et al., 2014); (Hodgson et al., 2011); (Leutwyler et al., 2014); (Johnstone et al., 2009); (Weissman et al., 2006); (Happell, Scott, Platania-phung, et al., 2012); (Glover et al., 2013); (Mcdevitt et al., 2006)
	PA is influenced by negative expectations and misconceptions	Community	Faulkner, Gorczynski and Cohn, 2009); (Rastad et al., 2014); (Gorczynski et al., 2013); (Carlbo et al., 2018);

			(Johnstone et al., 2009)**;** (Hedlund & Gyllensten, 2013)**;** (Soundy et al., 2007)
	PA is influenced by lack of facilities, resources, and environmental constraints	Community Physical environment Policy	(Faulkner et al., 2009); (Gorczynski et al., 2013); (Carlbo et al., 2018) (Hargreaves et al., 2017); (Hodgson et al., 2011); (Wright et al., 2012); (Happell, Scott, Platania-phung, et al., 2012)
	PA is influenced by individuals' lack of money/ unemployment and ability to self-travel	Intrapersonal Policy	(Rastad et al., 2014); (Happell, Scott, Platania-phung, et al., 2012)
Social support	The support of mental health professionals and family/friends	Interpersonal	(Cullen & McCann, 2014) (Huck et al., 2018) (Carlbo et al., 2018) (Hargreaves et al., 2017); (Hodgson et al., 2011); (Leutwyler et al., 2014); (Johnstone et al., 2009)**;** (Leyland et al., 2018)
	The benefit of increased social interaction through PA programmes/Expanding social opportunities	Interpersonal	(Cullen & McCann, 2014); (Leutwyler et al., 2014); (Wright et al., 2012)
	Group-based exercise is better for enjoyment and adherence	Interpersonal	(Huck et al., 2018) (Carlbo et al., 2018) (Hargreaves et al., 2017); (Leutwyler et al., 2014); (Wright et al., 2012)
Strategies to be more active	Action planning	Intrapersonal	(Rastad et al., 2014)
	Discovery of fun activity or tailored	Intrapersonal Interpersonal	(Rastad et al., 2014); (Leutwyler et al., 2014)
	Integrated PA as part of care	Interpersonal Physical environment Policy	(Huck et al., 2018) (Carlbo et al., 2018) (Hargreaves et al., 2017); (Leutwyler et al., 2014); (Happell, Scott, Platania-phung, et al., 2012)

2.5.3.1 Biopsychosocial benefits of physical activity

In this extension of the critical review to qualitative research has demonstrated a number of salient themes across the literature: Bio-psychosocial benefit of PA, Barriers to Physical activity, Social Support, Strategies to be more active. Each of these themes and the studies from which they have been found is shown in Table 2-3 above. These themes will now be discussed individually in the subsequent section. In Table 2-3, the theme ‘the Biopsychosocial benefits of PA’ is seen to be prolific (Cullen & McCann, 2014; Hargreaves et al., 2017; Hodgson et al., 2011; Wright et al., 2012). Service providers were also shown to recognise the broad psychosocial benefits that people with SMI may obtain from engaging with PA. These benefits included engagement with services and attention to personal hygiene (Faulkner & Sparkes, 1999). In Leyland *et al.* (2018) PA was considered a means improve mood and distract from disabling psychiatric symptoms according to community MH teams based in the north of England that participated in focus groups. Another study discussed changes in self-esteem and confidence from PA (Hedlund & Gyllensten, 2013).

There is diversity between studies in relation to how such improvements in MH outcomes are explored and discussed. For instance, Ho, Dahle and Noordsy (2018) take a positivist approach using semi-structured interviews with 23 people with SZ showing approximately half of the sample had discussed the theme of MH symptoms improvements from PA. Other studies which had adopted more interpretivist approaches, showed how people with SMI view the benefit of PA in the sense of a journeyed recovery. For example, in Hargreaves *et al.* (2017), PA is discussed as being a mediator of normality which helps to overcome the disabling effects of psychological distress. Similar findings, albeit perhaps not to the same level of interpretation, are shown in exploratory research from Ireland and in Sweden. Here PA is shown to provide stabilised routines for participants among an otherwise chaotic lifestyle (Cullen & McCann, 2014; Rastad et al., 2014).

The findings discussed in the previous paragraph speak to PA playing as a useful distraction method to manage symptoms associated with mental illness. This phenomenon appears particularly relevant when preformed at more high intensity PA. In Hargreaves *et al.* (2017), PA performed at high intensity is described by some with SMI as a mechanism by which negative voices can be blocked out.

5.5.3.2 Barriers to physical activity

A number of the studies explicitly explored barriers to PA for people with SMI (Glover et al., 2013; Hodgson et al., 2011; Leutwyler et al., 2014; Mcdevitt et al., 2006; Rastad et al., 2014). Identified interpersonal level barriers relating to psychiatric symptomology and associated physical and mental illness comorbidity were shown to be widespread in the literature. These interpersonal barriers often overshadowed environmental and other level barriers (Hodgson et al., 2011; Rastad et al., 2014). These barriers were also shown in the research that explored the perspectives of service providers (Carlbo et al., 2018; Leyland et al., 2018). Stigma was also an identified barrier to PA. In a number of studies, stigma related to a perception of the individual with the mental disorder of how they believe they are being perceived by others (Happell, Scott, Platania-phung, et al., 2012; Soundy et al., 2007). Qualitative research studies that has utilised the SEM, both reference limitations with regard to participation in the community outpatient facility (Faulkner et al., 2009; Gorczynski et al., 2013)

5.5.3.3 Social support

Social support in the context of the currently reviewed literature appears to predominantly relate to the role of MH service providers and the benefit of social connections in providing a normalised environment (Hodgson et al., 2011). The unique position of influence which service providers hold has been shown to have positive and negative consequences depending on the outlook or knowledge of the service provider that is providing support on PA (Hargreaves et al., 2017). All six studies with service users made some reference to the value of the support from MH professionals in supporting PA

(Cullen & McCann, 2014; Hargreaves et al., 2017; Ho et al., 2018; Hodgson et al., 2011; Huck et al., 2018; Rastad et al., 2014). However, the form that social support takes is varied in the reviewed studies. For example, some report the importance of service providers in collecting the individual from their place of residence (Hodgson et al., 2011). In Ho et al., (2018) people with SZ were independently exercising under their own volition. The findings showed that social support received from prescribing doctor in the form of encouragement and advice, was a small enabling factor for starting to become physically active when compared to motivations sourced entirely intrinsically (Ho et al., 2018).

The role of activity leaders which are a service provider of sorts, is also an emergent concept providing social support for PA among certain SMI population groups. Service providers, in the form of activity leaders were fundamental to participants engagement, particularly where support was sensitive to the low levels of self-confidence of people with SMI (Hodgson et al., 2011). Participants of Rastad, Martin and Åsenlof (2014) highlighted the benefits of being accompanied to exercise facility by a familiar person, and the beneficial effect of being able to share experiences of PA with another person after PA is complete (Rastad et al., 2014). The importance of having equal service provider participation in a specified activity was recognised among multidisciplinary service providers providing rehabilitation care in study included that was from the USA (Leutwyler et al., 2014).

Social support from other people that have experienced MH difficulty was identified in other research as a key facilitator to PA for people with SMI (Huck et al., 2018); but does not appear to be as frequently reported as a support mechanism from MH service providers. Aside from the valuable role that MH service providers are shown to play in relation to social support for PA for people with SMI, the included research indicates that social support from group-based PA, and hence, participating peers also appears valuable. Within studies where this was identified, group-based PA can in some instances provide a ‘buddy’ type peer support among people with SMI where they may also participate in other therapeutic programmes together. Physical activity within a group setting may contribute to building a sense of belonging among participating individuals who take up a place of status within a group (Leutwyler et al., 2014). In this regard continuity of being accompanied by the same individual is valued (Rastad et al., 2014).

5.5.3.4 Strategies to be more active

A key strategy employed within the literature to improve PA levels of people with SMI is the use of group-based PA sessions. For example, the previous section points to a considerable number of studies included in this review that alluded to an intensive level of social support from service providers desired by people with SMI in relation to supporting PA participation. Other strategies discussed within the literature include action planning. In Rastad *et al.* (2014), people with SMI discussed the beneficial effects that structuring PA sessions through action planning can have. In this case, action planning includes early preparation of equipment and scheduled PA. These logistical planning measures may also be received from other persons in the therapeutic alliance. Some research demonstrated the value of logistical support requirement that MH service providers offer in providing transport for participants to PA programmes (Hodgson et al., 2011).

In the context of strategies to be more physically active, a number of other factors arose consistently through the literature to help define this overall theme. A number of studies describe how participants prefer to engage in light intensity PA such as walking, particularly in outdoor areas that are picturesque (Leutwyler et al., 2014; Rastad et al., 2014). In the case of Leutwyler *et al.* (2014), participants with SMI were older adults, which may be relevant to their proclivity for light intensity PA.

2.5.4 Discussion of qualitative review in the broader literature

There is variance in the strengths and limitations of qualitative and quantitative research that has investigated the factors that influence PA and or SB in people with SMI (Farholm, Sørensen and Halvari, 2016; Firth et al., 2016). In particular, efforts to bring together qualitative research on the factors that influence PA and or SB in people with SMI are in need of updating to ascertain factors that influence PA that are politically socio-culturally, and environmentally relevant. While there are a number of existing reviews of qualitative research in this field (Glowacki et al., 2017; Mason & Holt, 2012; Roberts & Bailey, 2011; Soundy et al., 2014), which have already been discussed (Section 2.5), these reviews are arguably limited in their capacity to inform practice in the context of the current research aims due to relative age of the reviews, a focus on trial or intervention research, and an omission of key stakeholders. Therefore, as a stand-alone, this section of the critical review is valuable with respect to bringing together the most recent qualitative research as the existing evidence synthesis in this regard is insufficient at present.

That said there are a number of similarities in the findings of the current review and that of existing reviews. For example, previous review studies have shown broad bio-psychosocial benefits of PA, which has also been shown here in the existing studies of this review of qualitative research. In Mason & Holt (2012), this benefit is focused on improvements in psychiatric symptomology, or clinical recovery. The benefits of PA for mental illness symptoms is discussed across the spectrum of studies included in other qualitative studies on PA interventions for people with SMI (Crone, 2007; Faulkner & Biddle, 2004; Faulkner & Sparkes, 1999). Qualitative research on intervention studies has reported similar distractions from mental illness symptomology through PA interventions. For example, an Irish study, not included in the reported review of the current research, which engaged people with SMI in a woodland walking project showed how participants perceived the woodland environs as a positive distraction which alleviated symptoms (Iwata et al., 2016).

The current review carried out here demonstrates that social support, particularly received from MH service providers and from participating in group-based PA is of considerable prominence within the qualitative literature. Other research which has focused inquiry into the concept of social support alone defines this concept more specifically. For instance ‘emotional support’, which encompasses supervision of exercise session by exercise professionals is among the most widely reported type of social support in the literature on social support (Gross, Vancampfort, Stubbs, Gorczynski, & Soundy, 2015). Time and again, the role of the MH professional involved with the delivery of PA or exercise is shown to be an important predictor of intervention success in terms of increasing levels of PA (Firth et al., 2015). There are examples of trained exercise facilitators providing this social support in successful PA interventions, such as the TREAD trial (Chalder et al., 2012). The TREAD trial utilised 13 face-to-face, and telephone motivation contacts, in addition to supervised exercise sessions for people with MDD. Follow-up qualitative research showed the value of this social support extended beyond mere encouragement on PA. Searle *et al.* (2014) carried out repeat interviews with TREAD participants focusing on the relationship between PA facilitators and participation. Participants described how PA facilitators fostered a sense of autonomy among participants in pursuing PA on their own, a concept known as autonomous regulation in some research (Vancampfort, Moens, et al., 2016).

Not surprisingly, qualitative research on PA intervention studies, as per the synthesis carried out by Mason & Holt, (2012), shares similar findings to that of the non-intervention studies shown here in the current research. Early research in this regard posits the idea that group-based PA and the implicit social interactions are likely a distraction from negative MH symptoms (Faulkner & Sparkes, 1999). The concept of the sense of belonging is also a poignant theme which surfaces within qualitative research on PA interventions (Khalil, Callaghan, Carter, & Morres, 2012).

While already discussed, the different perspectives of MH service providers and service users together may bring unique perspectives factors that influence PA. The value of both stakeholders perspectives is shown to be independently important (Verhaeghe, De Maeseneer, Maes, Van Heeringen, & Annemans, 2013). Such findings also give rise to questions with regard to the perspectives of professionals such as carers, who may be well placed to support the closing of the gap in PA levels among community dwelling persons and outpatients with SMI already discussed in Chapter 2, Section 2.3. It seems appropriate for research efforts to incorporate such key stakeholders in exploratory and implementation work going forward.

The therapeutic role of PA could potentially be overshadowed by competing demands on time and resources and a fundamental ambivalence to the importance of PA on the part of the MH care professional. In Ireland, where policy is comparatively poorer than international counterparts, this issue is potentially even more prominent. By combining the views of all relevant stakeholders in relation to PA (Verhaeghe, De Maeseneer, Maes, Van Heeringen, & Annemans, 2011), one can provide a comprehensive picture of analogous perspectives and experiences of PA between service user and MH care professional, and therefore explore the effective and ineffective strategies for PA implementation. It seems relevant to have ascertained a complete multidisciplinary perspective, including the perspective of PSW and carers in addition to more traditional medical roles in future qualitative inquiry. The value that these individuals may have in the therapeutic alliance, and their importance due to the unique perspectives which they have, potentially make them valuable assets to informing future lifestyle interventions for people with SMI (Happell, Wilson, Platania-phung, & Stanton, 2016; O’Hara et al., 2017; Stubbs, Williams, Shannon, et al., 2016). Considering this point on multidisciplinary inclusion, it is pertinent to consider the work of Cullen and McCann, where attitudes to PA and exercise interventions of 10 people with SMI in Ireland were explored. Now, the methodological limitations become more acutely noticeable. By focusing specifically on the view-point of the MH service users, the observed difference in perspectives that can occur across the spectrum of roles within MH care, compounded by unique social, and care contexts norms, further emphasises the importance of multidisciplinary inclusion in understanding PA and SB for people with SMI. This is particularly relevant in future Irish research where PA promotion/implementation is something which may be a priority of multiple allied professions, such as occupational therapy (Department of Health and Children, 2006; Matthews et al. 2018).

2.5.4.1 Methodological consideration in the review of qualitative research

The literature included in this review of qualitative research (shown Table 2-2, above) exemplifies diversity across the literature that has explored the experiences of PA during and SMI. From the studies included in this section of the critical review, a number of theoretical frameworks and philosophies shaped and informed the inquiry. These include, Social Ecological Models (SEM) (Faulkner et al., 2009; Gorczynski et al., 2013), the Health Belief Theory (Huck et al., 2018), Grounded Theory (Leutwyler et al., 2012, 2014), The Theory of Planned Behaviour (Leyland et al., 2018), and IPA or other phenomenologically informed approaches (Hargreaves et al., 2017; Johnstone et al., 2009; Wright et al., 2012). Other studies utilised more positivist approaches and or predetermined themes (Ho et al., 2018; Hodgson et al., 2011). In a number of the included articles, this information was not entirely clear (Carlbo et al., 2018; Cullen & McCann, 2014; Glover et al., 2013; Happell, Scott, Platania-phung, et al., 2012; Hedlund & Gyllensten, 2013; Mcdevitt et al., 2006; Rastad et al., 2014; Soundy et al., 2007; Weissman et al., 2006). In addition, the included studies show that a number of versions of content analysis were used as a method during data analysis (See Table 2-2, above), three of the studies make reference to Braun and Clarke (2006). Two of these studies were strongly rooted in a theoretical framework (Gorczynski et al., 2013; Ho et al., 2018). These findings show that Braun and Clarke (2006), thematic analysis approach has applicability in the context of different theoretically framed studies, and may be a suitable approach for qualitative research in this project.

The journey of recovery (Discussed in detail Chapter 2, Section 2.3.5), has been explored using qualitative phenomenologically informed research studies. In MH research generally, it is argued that by not ‘defining recovery’ prior to inquiry, people with SMI have been able to tell their story of recovery and the experience of their recovery

(Davidson et al., 2005). A similar critique can be applied to PA as part of recovery orientated care for people with SMI, which has been highlighted previously by Faulkner and Carless, (2006). In their writing, they argue that PA during recovery from SMI presents experiences that are likely unique and not easily and objectively measured and therefore beyond the scope of the positivist paradigm, but meaningful in the context of the recovery journey. In this way, interpretivist qualitative research, using a version of phenomenology appears well placed to guide inquiry of future qualitative research of this nature (Faulkner & Carless, 2006; Hargreaves et al., 2017).

2.5.5 Section summary

In this Section 2, the SEM is introduced as a theoretical framework which may be useful in guiding and framing inquiry on the factors that influence PA for people with SMI. This model is put forward as counter narrative, offering comprehensive acknowledgement of factors that influence PA across multiple levels, including: intrapersonal; interpersonal; organisational and community; physical environment and policy. The comprehensive nature of the SEM is a welcome contrast to widely used frameworks within SMI literature that have placed a large focus on psychosocial factors that influence PA.

In Section 2.5 a deficit in the literature with regard to synthesising qualitative research on PA and SMI is illustrated. To address this and to inform the future phases of this current research project, a review of the qualitative research in this field is shown. This review and subsequent discussion show a plethora of factors that influence PA and unique experiences of PA during SMI that would not be captured in quantitative research. These benefits appear to broadly sit within two recovery domains, clinical and the journeyed recovery. In doing so, this further exemplifies the relevance of PA programmes in the context of current recovery focused service provision nationally and internationally in broad alignment with mental health paradigmatic shift, which will be discussed in more detail in the following section (2.6). This consideration of qualitative research in this critical review demonstrates an emergence of the importance of multidisciplinary perspectives in relation to PA and SMI, something which was not captured in earlier transdiagnostic reviews of qualitative research (Mason & Holt, 2012), requiring more wide and robust approaches to investigation in future qualitative research.

In understanding the differing strengths and limitation of both quantitative and qualitative research highlighted in this section, the two should be seen to complimentary to one another in understanding the factors to influence PA behaviour and SMI. To summarise the work of this chapter, Table 2-4 (overleaf) broadly lists prominent factors that influence on PA for people with SMI which have been alluded to in this section from qualitative studies included.

Table 2-4. Summary of influencing factors on physical activity and SMI

Factor of influence	Type of influence	SEM level
Exercise professional led intervention	Positive	Interpersonal/Policy
Multidisciplinary intervention	Positive	Interpersonal/Policy
Adjunct dietary and PA intervention together	Positive	Interpersonal/Policy
Structured group-based PA	Positive effect	Interpersonal
Advancing age	Inconclusive evidence	Intrapersonal
Physical comorbidity	Negative effect	Intrapersonal
Weight gain	Negative effect	Intrapersonal
Psychiatric symptomology	Negative effect	Intrapersonal
Psychological markers of autonomous regulation	Positive effect or negative effect	Intrapersonal
Social support from MH professional	Positive or negative effect	Interpersonal
Social support from family and friends	Positive or negative effect	Interpersonal
Sedentary norms in MH settings	Negative effect	Organisational and Community/environmental
The provision of meaningful activity	Positive effect	Organisational and Community
Meta-perceptions of PA	Negative effect	Organisational and Community
Poor aesthetics of locality	Negative effect	Physical environment
Perceived risk of criminality	Negative effect	Physical environment
MH service provider participation in PA	Positive effect	Interpersonal
Social interaction during PA	Positive effect	Interpersonal
Feeling safe during PA	Positive effect	Organisational and Community
Achieving a sense of purpose/meaning	Positive effect	Intrapersonal
Loss of social interactions	Negative effect	Interpersonal
Having transport provided	Positive effect	Policy
Low self confidence	Negative effect	Intrapersonal
Improving MH symptoms	Positive effect	Intrapersonal
Tailored PA	Positive effect	Interpersonal/Policy
Stigma	Negative effect	Interpersonal/ Organisational and Community
Activity leaders/PSW	Positive effect	Policy
Advice from a medic	Positive effect	Interpersonal/Policy

At this point in this critical review, clear evidence is presented which demonstrates that PA can be used as a routine therapeutic intervention for people with SMI. In this sense, PA is referred to as having a role in clinical recovery which pertains symptom amelioration (Rosenbaum et al., 2014; Firth et al., 2015; Schuch et al., 2016). Similarly, there has been advancement in research that has attempted to understand the factors that influence PA and SB of people with SMI (Soundy *et al.*, 2014; Glowacki *et al.*, 2017). However, as the effects of PA on MH and physical health for people with SMI become clearer from intervention research, it appears that the challenges with regard to translation of PA into clinical practice remain. This phenomena is termed the ‘translational gap’ (Deenik et al., 2019; Rebar & Taylor, 2017). Qualitative research seems well placed to unpack this phenomenon if approached from the perspective of service users and service provider experience.

Section 3: Service improvement and Experience-based Co-design

2.6 Section introduction

In this section of the critical review, the literature will be examined so as to address the already widely referenced translational gap (Deenik et al., 2019; Rebar & Taylor, 2017). While efforts have been made to bridge the translational gap and improve service delivery in relation to PA and SB, Experience-based Co-Design (EBCD), which is a health service development approach, is put forward in this section as a novel approach to developing a PA and SB programme. Adopting an EBCD approach to service development in this way may address the challenges inherent to the translation gap and, at the same time, reflect the current trajectory of modern mental health care services with respect to ethos and philosophy.

2.6.1 Paradigmatic shifts in health research and practice

Before a rationale for EBCD can be put forward, a comprehensive understanding of the philosophical influences on EBCD must be considered. Traditional and well established health care paradigms of, what is often referred to as a medical model (Department of Health and Children, 2006), have been subject to a status –quo challenge from bourgeoning research and practice methodologies. These methodologies place value in empowerment of patients (in this research referred to as service users) and equal social relations in research production. These new methodologies are thought to have an impact on the broader social and political landscape (Martin, 2008). These methodologies move against the prevailing medical research that sits broadly within positivist epistemologies of objective inquiry and paternal approaches to care and practice (Glasby & Beresford, 2006).

This movement, characterised by shared decision making, quality improvement, evaluation and service re-design has proliferated health care generally, and is now entrenched in the approach that services take to delivering care (Palmer et al., 2018). In the context of this current research, the Irish MH policy guidance document- *A Vision for Change*, must be considered (Department of Health and Children, 2006). Largely viewed as a beacon of good practice at the time of publication, *A Vision for Change* advocated for a reorientation of Irish MH care to make issues such as: service user inclusion; recovery during mental illness; and social inclusion priority issues for services and policy makers. In the UK, the shift towards service user/public involvement in health care practice is most evident through the NHS's establishment of INVOLVE which is a national government body tasked with driving and guiding public involvement in health care and research (Palmer et al., 2018; Staley, 2009).

The aforementioned paradigm shift has, as mentioned, the key tenet of service user involvement in delivery and development of their service (Foot et al., 2014). In doing so, this paradigm shift mandates equal power relations between patient and health care professionals in the care process (Coulter & Collins, 2011). The benefits of this are outlined in Foot *et al*. (2014), and shown here:

- Will improve quality of service by empowering patients to make choices between services.
- Will be truly democratic, in that people have political, social and economic rights to be in control of public service and exert influence on its delivery.
- Will be ethical in the sense that, evidence-based medicine must work in harmony with personal experience in the context of managing risk and harms from care.
- Will be the most cost-efficient manner of delivering care, in the sense that care should meet the person's need and also meets their preferences, as opposed to costs associated with not meeting preferences.
- Will be sustainable by involving people in their own health care and maintaining independence; reliance of services should reduce.

- Will be person centred and tailored to the specific needs which should solidify multidisciplinary treatments and reduce the siloed care

A number of challenges have emerged through an unchecked proliferation of health care practice and research to meet new policy demands of adopting and integrating concepts such as co-production and co-design, essentially bringing a complete re-design to many MH services (Palmer et al., 2018). Within ‘service user inclusion’ literature, the concept outlined above are poorly defined and therefore potentially misguiding (Millar et al., 2015). This may in-part contribute to evidence of some efforts to include service users in care partnership as tokenistic and therefore unproductive (Beresford & Croft, 2004). The consequence of this has shrouded co-design and co-production in uncertainty with regard to demonstrable effects (Iedema et al., 2010).

2.6.2 Service user inclusion in recovery focused mental health care

The movement to include service users has in-part been attributed to activation of traditionally marginalised groups in response to powerlessness to exert influence on their own model of care. There are few better examples of this than the context of recovery focused MH care within some economically developed countries (Faulkner, 2010). A recovery approach to care relates to a climate or ethos of a service which fosters individuality, risk and empowerment, which are underpinned by the principles of hope, personhood, responsibility, choice, healing from within, peer support, and autonomy (Higgins & McBennett, 2007). While the concepts of clinical recovery are not new to MH services, the concepts of a journeyed recovery and the recovery approach to care have been the subject of a number of international MH policy shifts, notably New Zealand (Mental Health Commission, 1998), the UK (Department of Health, 2001), and in Ireland (Department of Health and Children, 2006). This last reference refers to the AVFC policy in Ireland.

To effectively deliver on the AVFC policy, the National Framework for Recovery in MH was developed (Health Service Executive, 2018). This framework puts forward four key principles that should reflect the care practices of contemporary MH services in Ireland. These principles are: (i) Centrality of experience, (ii) Co-production between all stakeholders, (iii) An organisational commitment to developing recovery orientated mental health services, and (iv) Supporting recovery orientated learning and recovery orientated practice (Health Service Executive, 2018a).

Reflecting on these principles outlined in the National Framework for Recovery (Health Service Executive, 2018), it is clear how international MH care, including Irish service provision, is arguably stand-alone in its commitment to reorientation of practice and research towards a service user centric approach. Patient-centred care is a key tenet of the recovery movement which has its origins in rehabilitation focused MH. It is this rehabilitation focused MH which saw the closing of large institutions and the drive to treat service users in the community (Mezzich, 2010). Mental health care reform in Ireland also puts service user centred care as a foundational recommendation for practice (Department of Health and Children, 2006). The AVFC document advocates for integrated multidisciplinary approach to care and ‘partnership’ with service users, family and carers at all levels. Mental health services are at the apex of this movement on account of historical contexts where power historically lay with the institutions. Now however, it is argued that decisions ought not to be made in the absence of lived experience; a concept referred to as ‘expertise by experience’ (as per the first principle of the National Recovery Framework). This principle is also an underpinning concept within co-design and co-production. Therefore, this provides a strong point from which co-design/co-production and MH service reform fittingly align (Bate & Robert, 2007; Palmer et al., 2018).

While national MH policy reflects the paradigmatic shift already outlined, in many respects practice in Ireland appears to be lagging behind in policy. For instance, a recent cross-sectional study of MH nurses in Ireland with over 1000 participants showed 20% of the sample did not believe their service was recovery focused and a further 25% were unsure on the matter. Follow-up focus group findings suggested that nursing staff perceived only partial service permeation of a ‘recovery ethos’ and that greater efforts to ‘de-program’ existing staff would be required to bring practice in line with policy (Cusack, Killoury, & Nugent, 2016). Whilst a lack of political will and nihilistic management are oft suitable scapegoats for this partial permeation of the recovery ethos, it must also be remembered that there are factions within the psychiatric and academic communities that view the emergence of the recovery movement and declining contribution of medical approaches in psychiatry as synonymous with an attack on the psychiatric discipline which is viewed as inseparable from a biomedical ethos by some (Craddock et al., 2008).

Recognising a policy practice gap, the National Framework for Recovery, as previously discussed offers MH services in Ireland a framework guide for bringing recovery orientated practice into fruition (Health Service Executive, 2018). For example, principles (iii) An organisational commitment to developing recovery orientated mental health services, and (iv) Supporting recovery orientated learning and education provide the impetus for adopting novel and radical recovery orientated services by structural and resourcing re-direction that reflect policy. Perhaps the best example of this redirection of service delivery is the concept of the Recovery College. The Recovery College concept offers a facility within existing MH services which is a community-based hub for education and co-production. It is a space where people elect to take courses, rather than receive referrals for “care” (Perkins et al., 2012). Presently, there is one Recovery College for the South-Eastern region of Ireland (SECH) within which this current research project is situated (Health Service Executive, 2018). Recovery education delivered through the Recovery College must value the principles of lived experience, strive to increase knowledge, facilitate peer support, support co-production, nurture experimental opportunities to grow, and centre around education (Health Service Executive, 2018). Adopting these principles in delivering a service reflects a paradigm shift in MH care (Slade, Adams, & O’Hagan, 2012). In essence, Recovery Colleges offer a tangible, bricks and mortar embodiment of mental health services that strive to shift the balance of power between mental health service user and service providers (Slade et al., 2012).

In the UK, qualitative research has shown enhanced understanding of recovery, improved service user and service provider interactions and easily facilitated learning among recovery college user (Sommer, Gill, & Stein-Parbury, 2018). Recovery Colleges present a new concept within recovery focused services, with only limited evidence in existence for their effectiveness (Ebrahim, Glascott, Mayer, & Gair, 2018; Sommer et al., 2018). For instance, there is now widespread recognition that efforts to increase PA levels and reduce SB in SMI populations have not given sufficient attention to service user inclusion to adequately overcome barriers that are not well understood without listening to lived experience (Deenik et al. 2019). At face-value, the concept of the Recovery College appears a viable route from which PA programme development and implementation may be supported.

2.6.3 Experience-based Co-design

Experience-based Co-design, formerly referred to in the literature as Experience Based Design (Bate & Robert, 2007), is an approach to improving health care services that merges overlapping strands from Participatory Action Research (PAR), and User design theory, Learning theory, and Narrative Research to procedures service development and improvement (Bate & Robert, 2007; Robert, 2013; Springham & Robert, 2015). While still in its infancy, the EBCD approach is well suited to MH settings, and as such has been applied to a number of different MH settings with beneficial effects shown. See Table 2-5below for summary of EBCD projects within MH settings.

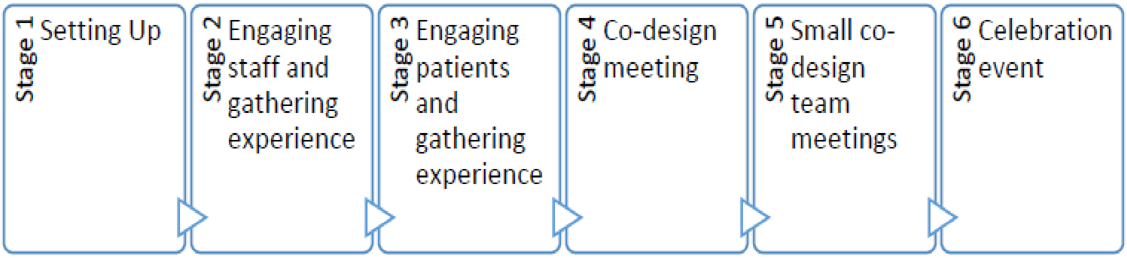
Table 2-5 Mental Health Research using EBCD

	Author(s)	Focus	Key outcomes
1	(Cooper, Gillmore, & Hogg, 2016)	EBCD for general MH service improvement	Physical environment adaptation recommendations. Positive service users experience of process
5	Cranwell *et al.* (2016b)	EBCD for improved experience and care during transition between tertiary and primary care (SMI with comorbidity)	Transition Problems identified Two action plans implemented – 1. Information brochure. 2. New procedures around continuity of care
2	(Larkin, Boden, & Newton, 2015)	EBCD for service improvement (early psychosis)	13 action plans devised as recommendations. Minor service improvement changes implemented. Enthusiasm and energy for the project
3	(Springham & Robert, 2015)	EBCD for the development of a relational model of engagement	Procedural changes to triage system. - Reduction in number of formal complaints. Enjoyable process reports.
4	(Lauralie et al., 2017)	EBCD for psychosocial recovery outcome improvements (SMI in community MH services)	NA (in process).
5	Cranwell *et al.* (2016b)	EBCD for improved experience and care during transition between tertiary and primary care (SMI with comorbidity)	Transition Problems identified. Two action plans implemented – 1. Information brochure. 2. New procedures around continuity of care.

‘Traditional’ EBCD is characterised by a six stage cyclical process which features a ‘co-design’ process involving service provider, service user and carer stakeholders in facilitated reflection, improvement prioritising, devising development procedures and then reflecting on any achievements (see Figure 2-2, below) (Springham & Robert, 2015). EBCD was first piloted in the NHS UK head and neck cancer services in 2005/06 (Bate & Robert, 2007). However, its subsequent success in real world health care setting reform have prompted its widespread application in a number of diverse health care areas such as, but not limited to; acute psychiatry, palliative care, emergency medicine, substance misuse, oncology, diabetes services and paediatrics (Bate & Robert, 2006; Donetto et al.

2014). In its essence, EBCD captures and then makes service user's experiences available to participants of the EBCD collaboration process which features multi-stakeholder representation. By using narrative trigger films of service users as a catalyst during stages of facilitated collaboration, experience inspired improvement priorities and developments can be identified and planned for implementation (Donetto et al. 2015).

Figure 2-2 Visual representation of the stages of traditional EBCD



Adapted from Donetto *et al.* (2015)

2.6.4 The stages of traditional EBCD

The original model of EBCD is broken down into 6 stages, and outlined in the work of Donnetto and colleagues in 2014 and within the Point of Care Foundation Toolkit (formerly the Kings Fund Resource Kit) (The Point of Care Foundation, 2013). Stage 1: *Setting up* involves project management and roles being established. In Stage 2: *Engaging staff and gathering experiences*, a wide range of service providers are asked about their experiences of working in a service through semi-structured interviews that are subsequently analysed thematically. Following completion, service providers are gathered to review emergent themes in order for prioritisation. Stage 3: *Engaging patients and gathering experiences* runs in parallel to the second stage where service users and carers are recruited and interviewed with consensual filming to describe experiences of their engagement with the service. Following this, films are reviewed by the research team to identify ‘touchpoints’ or key experience shaping moments during service interaction. An edited master film representing touchpoints is subsequently generated from exerts of each individual film. In Stage 4: *Co-design meeting,* service users’ and service providers’ priorities are presented to a multi-stakeholder group(s). It is at this point that the master film is played to all stakeholders. A joint collaborative exercise is then carried out to identify priorities for service improvement. In Stage 5: *Small co-design teams* are formed (4-6 people). These small facilitated teams meet to design solutions and recommendations for service improvement going forward. The Stage 6: *Celebration event,* involves the group reconvening to discuss completed work and establish future direction and plans (Locock et al. 2014).

2.6.5 The ‘Experience’ in Experience-based’

> *Experience – that evanescent flux of sensation and perception that is, in some sense, all we have and all we are. Erik Davis in* Bate and Robert (2007).

The Experience-based Co-design approach is informed and shaped in-part by Participatory Action Research (PAR). The extent of influence from this field appears to be increasing in relevance with the development of, and research on EBCD (Robert, 2013). PAR itself takes influence from phenomenology, valuing the subjective, the symbolic and the experience; in doing so, phenomenology positions itself against more positivist paradigms which allied to traditional medical models of health care. Participatory Action Research has helped to shape EBCD, which means that EBCD has a concrete grounding in the philosophical enquiry of phenomenology as a consequence of the roots of this PAR influence (Bate & Robert, 2007; Robert, 2013).

Phenomenology stems back to early twentieth century philosophy, sparked initially by the work of Edmund Husserl as a criticism of positivist and empiricism movements

(Giorgi, Giorgi, & Morley, 2017). Phenomenology research is the study of the world as we experience it, its meaning but in its most untouched, or pre-reflective form (van Manen, 1997). Phenomenology is the study of the essence of experience, the essence of perception and consciousness (Merleau-Ponty, 1958), and is arguably at the heart of the EBCD approach.

Experience is by its nature intrinsic, interpretative, and subjective; this becomes more pronounced when considering the nuanced experiences that accompany mental illness symptomology. In exemplifying this intensified experience, a florid example from early social ethnography work by Erving Goffman in twentieth-century psychiatric units, shows how poor environmental and social structures within the walls of institutional buildings were perceived to shape the life course of a person's mental illness (Shalin, 2014). In contemporary recovery focused MH services, the experiences of one's own reality during mental illness or recovery is personal, multi-factorial and unique (Higgins & McBennett, 2007).

Phenomenological reflection of human experience is interested in meaning, which Martin Heidigger believed was formed through our being involved with things of our world (van Manen, 2007). Van Manen uses the word reflection in this sense intentionally as phenomenology takes the position that true introspection cannot be achieved, and that reflection of experience is therefore a retrospective exercise in a sense. Attempts to understand it must also be understood through the lens of the person trying to understand the experience of the person with mental illness, which too has its subjectivity (Yamamoto & Keogh, 2017). This concept of researcher 'accessing' experience relates to the theory hermeneutic interpretivism specifically termed double hermeneutic (Smith, Flowers, & Larkin, 2009).

Experience, is important because it shapes our judgements, feelings, sensations, opinion and memories, which ultimately is the essence of one's life (Bate & Robert, 2007). This therefore offers a deeper level of understanding which would not be gleaned from measuring attitudes and behaviour which are more easily measured or observed. By applying a double hermeneutic approach in phenomenologically informed research with narrative storytelling, as per EBCD (Bate & Robert, 2007), these experiences can be captured and used to inform real world development of services. Traditional medical-based evaluations where questionnaires have been used, do not capture experience in the same way that the phenomenological interview would (Robert, 2013). There are examples within nursing research where qualitative interviews with acutely unwell patients access a range of experiences that tell a story which does not reflect questionnaire evaluations of service experience (Maben, Adams, Peccei, Murrells, & Robert, 2012). Similarly, the experience of PA for people with SMI has been shown to reach great depths of meaning through phenomenologically informed research (Hargreaves et al., 2017; Wright et al., 2012). Such complex phenomena are not represented within attempts to understand behaviour among more quantitative approaches of same (Firth et al., 2016).

2.6.5 The 'Co' in Co-design'

With the wider MH paradigmatic shift discussed in Section 2.6.1 in mind, this section will deal with the Co-design concept within EBCD. The aforementioned shift has seen empowerment for the role of the service user and recognition of service user inclusion in every aspect of care. As the prefix in Co-design suggests, service user inclusion is at the heart of the EBCD approach. Whilst tokenistic service user inclusion efforts have been documented in the literature (Beresford & Croft, 2004), Bate and Robert (2007), assert that the prefix here denotes a much stronger role than simply service user inclusion. In the context of EBCD, they write, that service users take up a partnership role during the process. In doing so, one must not confuse this with a re-assigning of roles, but rather, recognition of the value of experience as expertise. Outside of EBCD, previous programmes in MH such as Wellness Recovery Action Plans have demonstrated this equalling of power relations between service user and non-service user participants through overtly challenging this position with consequent benefit for service user participants within the programme (Higgins et al., 2012).

In EBCD, achieving such a balanced partnership between participants, and indeed the researcher(s) is arguably where PAR methodologies emerge as pertinent within the EBCD approach. While PAR is a diverse area of research, PAR projects are typically consistent along four key principles, which are a collective commitment to investigate a problem, desire to engage in collective and self-reflection on the problem, a joint decision for self or collective action to bring solutions to the problem, and the shaping of an alliance between researcher and participant during the process (McIntyre, 2008). Ideally, all of these emerge during the EBCD process. This, in a sense describes a co-construction of knowledge for social change process, a process that speaks to equal power relations between participants, and therefore differentiated from mere tokenistic inclusion.

2.6.6 The ‘Design’ in Co-Design

Design sciences are explicitly named as having influence on the EBCD approach, yet this influence is broad and not positioned within a specific theory per-se (Bate & Robert, 2007). Despite the paradigmatic shift for medical and social care professions, the concept of end-user or service user inclusion in managing customer experience against functional and operational components is not a novel concept in private sectors. In private sector domains, the concept of a passive recipient of service seems unfathomable in industry where functionality, safety and usability must be harmoniously achieved in good design. As such, putting the service user at the centre of a design process is a commonplace practice in fields such as architecture, computing, and product design (Bate & Robert, 2007). While admittedly comparing disciplines like architecture and product design against health care services is a leap, Bate and Roberts argue that valuable lessons can be learned from these service areas, lessons which have been reflected upon and integrated into the EBCD approach. By cherry picking the “what works” in terms of good design and merging with the other academic disciplines that feed EBCD, Bate and Robert (2007) see this approach as an “extension of the current trajectory of the NHS” (Page 30). Thus, on the face of it, design sciences bring a new and pragmatic scope on using experience for health care. Its’ mark is seen in the EBCD approach in the EBCD toolkit; in particular, techniques such as modelling and prototyping are borrowed from this field (Robert, 2013).

2.6.7 The success and challenges in using Experience-based Co-design

Since its conception in 2005/2006, EBCD has enjoyed rapid proliferation within health services internationally, with widespread accounts of its acceptability and applicability for use across a range of health services (Donetto et al. 2014). This report, which is unfortunately the most up-to-date international synthesis of EBCD project works that are completed or ongoing internationally, show 59 multidisciplinary projects completed or ongoing, where EBCD methods are being applied. This work shows that across the published and un-published literature on EBCD, there are a vast number of modifications from traditional approaches to EBCD first put forward (Figure 2-2). Within these modifications, some are minor changes in response to contextual nuances. But others show a more fundamental move away from methodologies which make EBCD novel and unique in many respects (Donetto, Tsianakas, & Robert, 2014). The flexibility of the EBCD approach which is open to modification speaks to its ease of use and applicability within numerous and diverse health setting. However, a number of studies have eliminated whole stages of EBCD in carrying out their project and, the impact of this is unknown (Donetto et al., 2015).

Large scale evaluation research from 59 worldwide EBCD projects by Donetto and colleagues shows that EBCD projects have undergone many adaptations from the original design used in the head and neck cancer services (Donetto et al. 2014). From the 45 studies out of the 59 separate EBCD research project that responded to questions on the EBCD component part which they skipped, 15/45 skipped non-participants observation, 7/45 staff interviews, 7/45 patient interviews, 4/45 patient and staff co-design meeting, 5/45 small co-design work, 14/45 celebration event (Donetto et al. 2014). Within these modifications, there were further reported modifications across the EBCD project space.

For example, Donetto *et al. (*2014) reported on a project where co-design work took place over just one staff-only co-design session. The evaluation synthesis shows a plethora of strengths, and some weakness in using the approach, including, inadequate or incomplete co-design stages which have been shown to have less favourable effects on the efficacy of EBCD projects (Donetto et al. 2014). In one report, co-design groups reportedly disbanded prior to project completion, with no detail provided as to the direct consequence of this (Donetto et al., 2015). From the 59 studies that utilised EBCD, over 90% felt that EBCD had engaged service users. A further 78% reported that service providers were highly engaged, 63% reported that EBCD allowed for discussion of difficult topics in a supportive environment, and 54% reported that it resulted in worthwhile improvements (Donetto et al. 2014). Although data from patient participants is scarce, literature is available from an EBCD project carried out in oncology services (Adams, Maben, & Robert, 2013). In this research, the promising findings showed successful outcomes such as the creation of inclusive organisational development forums, the presence of senior management at events, the interests of senior management in facilitating dissemination of project work and the alignment between the EBCD approach and the best practice health care delivery (Adams et al., 2013).

2.6.7.1 Modifications made to EBCD

There are ample examples of widespread modification to EBCD projects worldwide, with mixed quality of documented justification for modification and the extent of modifications themselves (Donetto et al. 2014). With the exception of work by this researcher, there has been few other ‘co-design’ approaches to PA programme development used to determine PA intervention priorities or structure PA programmes for people with mental disorders (Wheeler, Roennfeldt, Slattery, Krinks, & Stewart, 2018; Graham et al., 2017). For example, in traditional EBCD, it is recommended that filmed narrative interviews with patients and carers take place to capture their experience of their illness at different key experience shaping moments. These films are synthesised by the researchers to portray ‘Touchpoints’ (experience shaping moments) which are subsequently utilised during stages of co-design to serve as a catalyst for service improvement (Donetto et al., 2014; Robert, 2013). In looking to the literature to understand previous modifications of EBCD, it is notable that in Wheeler *et al.* (2018), trigger films were not utilised as is advocated for in EBCD approaches. Similarly, non-physical activity related research that has utilised EBCD in MH settings has also omitted trigger film use (Larkin et al., 2015).

2.6.8 Translational physical activity and the applicability of EBCD

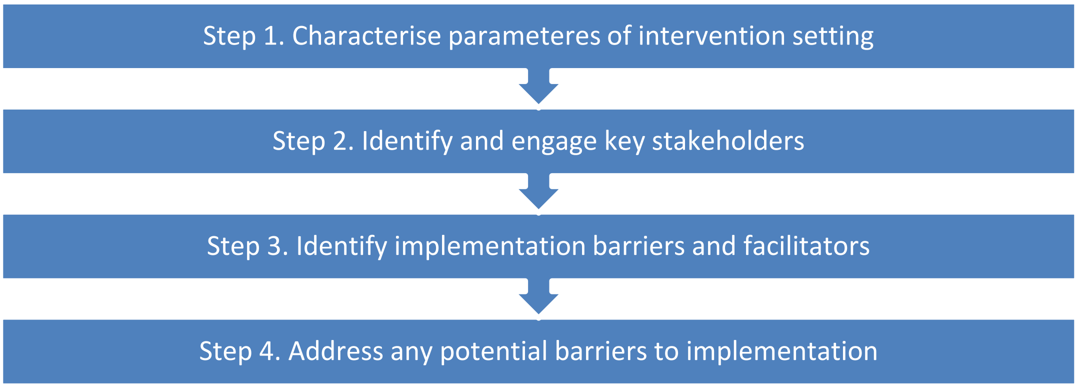
Returning to the evidence on implementing PA for SMI populations, a recent review has found that clear evidence for replicable, real world intervention approaches to PA/SB for increasing PA and reducing SB is not entirely clear (Ashdown-Franks et al., 2018). Previous sections of this critical review (Section 2.4) have elucidated the translational gap between effective PA interventions and clinical practice (Deenik et al., 2019). As previously indicated, advancements in research attempting to bridge this translational gap are not a phenomena exclusive to the MH literature (Reis et al., 2017). Much of PA epidemiology within research has focused on efficacy and effectiveness outcomes, with little attention to implementation, translation or scale-up of PA interventions (Milat, Bauman, Redman, & Curac, 2011). In this context, the National Institutes of Health refer to implementation as the application or use of strategy to integrate evidence-based intervention to change clinical practice. Scale-up is the extension of intervention reach into other local settings (NIH, 2011).

To address the growing problem in relation to poor translational research despite the presence of apparent efficacy of PA on a multitude of health areas, The Practical Planning for Implementation and Scale-up (PRACTIS) model was developed. The PRACTIS model provides a research roadmap to appropriately equip developing PA interventions to meet certain evidence-based criteria in order to increase likelihood of successful implementation, scale-up and sustainability in specific settings (Koorts et al., 2018). The application of PRACTIS provides researchers with guidance to engage key stakeholders early in the programme development process, and early anticipation with regard to planning for barriers to PA within clinical and community settings. A visual diagram of the PRACTIS guide is shown below in Figure 2-3, which has been adapted from Koorts *et al.* (2018).

The PRACTIS guide provides an applicable roadmap for implementing PA interventions into diverse settings. As can be seen in Figure 2-3 below, the PRACTIS puts forward four iterative step by step stages which researchers and clinicians should engage with to carry out successful PA implementation across settings (Koorts et al., 2018). While EBCD has not previously been utilised to develop a PA programme in a MH setting previously (Matthews, Cowman, & Denieffe, 2017), there are clear alignments with the four key stages of the PRACTIS guide and models of EBCD. Such alignment suggests that EBCD approaches to PA and SB programme development may be in keeping with an evidence-based PA implementation framework. Recently, the PRACTIS guide has been offered as a strategy suitable for MH settings to guide PA implementation strategy. A visual overview of the PRACTIS guide is shown below in Figure 2-3.

Figure 2-3 The PRACTIS guide flow chart

Adapted from Koorts et al. (2018)

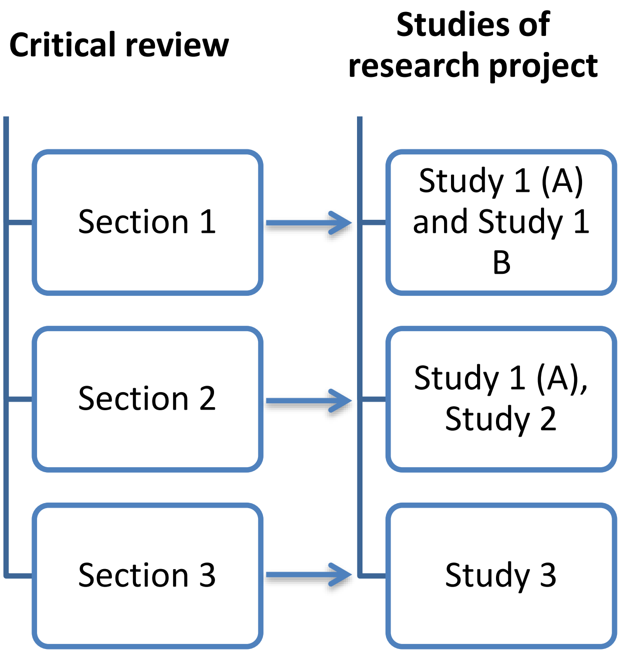


In their writing, Deenik *et al.* (2019) highlight fundamental issues that must be addressed in their review of appropriate methodological steps for integrating lifestyle interventions into MH setting, these steps are: address multilevel barriers and factors of influence among key stakeholders, and utilise co-design principles, to inform intervention development. Again, these recommendations show overlaps with EBCD, which has been successfully used in general service development of MH services (Larkin et al., 2015). What is more, previous paragraphs in Section 3 of this critical review demonstrate the current health care climate, and in particular the ethos with which MH care services have reoriented towards. Mental health service in Ireland must deliver care in a manner that is reflective of recovery orientated care, adhering to principles laid out in the National Recovery Framework (Health Service Executive, 2018). This preoccupation with new-wave patient inclusion has opened up research and practice that speaks to principles of patient inclusion at a semantic level, but fails to comprehensively adopt true participatory methods (Palmer et al., 2018). Contrary to these failing, EBCD appears to offer an approach that equalises power relations between stakeholders (Palmer et al., 2018), and places the service user experience at the centre of a design process (Bate & Robert, 2007; Robert, 2013). Experience-based Co-design has been shown to be effective in bringing about service level development in MH settings previously (Cooper et al. 2016; Cranwell et al. 2016; Larkin et al. 2015; Palmer et al. 2015; Springham & Robert, 2015). It seems relevant for PA and SB development in MH contexts to be informed by recovery principles which underpin the best practice approaches of MH care service delivery.

2.7 Conclusion to the critical review

This critical review brings together key literature to support the modification and use of EBCD to develop a PA and SB programme for people with SMI. In this writing, PA and SB are defined as separate but related entities. This critical review outlines the key literature on which the current research project is based. The critical review was divided into specific sections that draw on the literature to inform the three specific studies of this current research project. This is outlined in Figure 2-4 below.

Figure 2-4. Map of critical review and corresponding studies from research project



Uncontroversial evidence in this review exemplifies that regular PA and reduced SB have a dual therapeutic role for people with SMI. That is, that a lack of regular PA and prolonged periods of SB serves as independent risk factor for disproportionately occurring cardiometabolic comorbidity among SMI populations. This has been shown to contribute as a risk factor in the widening life expectancy gap between people with SMI and those without through the significant effects on cardiometabolic markers of health which has been outlined in the work of Neilson *et al (*2013). Increased PA and reduced SB appear to benefit symptoms of affect across multiple SMI diagnoses (Rosenbaum et al., 2014; Schuch et al., 2016). In this sense, PA is thought to be a useful resource for clinical recovery. In this critical review, recovery, and the role of PA and SB have with respect to recovery are examined across three separate concepts of recovery. These concepts are: clinical recovery, the journeyed recovery and the recovery approach to MH service provision. Throughout this research project, these three independent concepts of recovery are relevant to the various inquiry approaches undertaken.

Whilst this critical review examined PA with respect to its role as a recovery resource, this review also examined the challenges that are associated with measuring PA and SB among this populations group. The challenges associated with measuring PA and SB in SMI populations suggests that people with SMI have nuanced PA and SBs which not only makes investigation of this concept relevant, but also different from that of the general population. This review outlined distinct challenges and merits which accompany the use of SRQ and OBM within PA research and SMI populations which researchers must consider with respect to desired outcome measures. This review has outlined the differences between sub-groups within SMI populations with respect to PA levels. For example, in many international examples, inpatients appear more physically active than outpatients due to the provision of structured PA at more moderate and vigorous intensities by MH service providers. Despite this, research discussed within this critical review indicate that people with SMI lead largely inactive lifestyles, with very low levels of PA, particularly in relation to MVPA. In addition to low level PA, people with SMI appear to spend a large amount of time in SB (<1.5 MET), which is itself an independent risk factor in the high level of physical comorbidity that is present across diagnostic groups (Vancampfort, Firth, et al., 2017). In Ireland there is currently no research with respect to quantitative examination of levels of PA and SB across any SMI grouping, suggesting a need for further high-quality research to address this gap. In this regard, both OBM and SRQ provide different measurement approaches, both with merits and limitations. From the literature discussed in this current critical review, it seems that SRQ approaches are beneficial for capturing larger sample data against outcome measures such as the NPAG. For MH populations, this outcome measure is a clinically meaningful measure of physical and mental health (Stubbs et al. 2018). However, SRQs do not offer a robust measure of SB in MH population. In this way, the literature discussed in this review makes clear a recommendation to adopt OBM to examine this concept in MH populations (Soundy et al. 2014).

In considering the poor PA levels found in SMI populations, international literature in this area points to a number of demographic factors that appear to exert influence of PA behaviours of people with SMI. For example, certain psychiatric diagnoses appear to have poorer PA behaviours relative to other diagnoses. People with BPD appear to engage in more moderate/vigorous PA comparative to other SMI diagnoses but also appear to engage in greater amounts of SB. People with affective disorders, particularly MDD appear to have dramatically poorer PA guidelines adherence compared to other SMI diagnoses of SZ. While diagnosis presents a clear delineation of this population group, there are other more nuanced influences which have also been highlighted in this writing. For instance, it is clear that there is a need to foster autonomous regulation around PA; that is people with SMI who have greater levels of autonomous regulation are also linked with having better PA maintenance (Vancampfort, Madou, Moens, et al., 2015; Vancampfort, Moens, Madou, et al., 2016). In addition, there are a number of barriers to PA, which in many cases are inherent to mental illness or treatment of mental illness that have been examined in Section 2.5 (Firth et al., 2016; Mason & Holt, 2012; Soundy et al., 2014). While the widely discussed translation gap between research and practice remains clear, the literature discussed in this critical review suggest that further examination of individual bio-psychosocial differences between SMI groups might further unpack this translational gap. With the literature considered, it seems some SMI population may be more active than other. Work is needed to examine these individual and nuanced differences between groups to elucidate factors which may be influencing PA levels. Furthermore, a concerted and specified targeting of multilevel barriers to PA which represent modifiable differences between these active and inactive people with SMI is widely held as a necessary step for effective PA programme development (Firth et al., 2016) which represents a core aim of this research, and provides rationale for examining the modifiable and less modifiable-demographic influences on PA in the form of barriers to PA in Study 1.

Examining the barriers to PA can inform policy and programme developers in relation to areas which influence PA that are subject to change or require more concentrated focus. However, they do not fully explain the phenomena within the individual experience of PA and SB. That is, while MH symptomology is a widely accepted barrier to PA (Firth et al. 2015), the lived experience of having mental health symptoms during a bout of PA may vary widely across individuals. In this way particular nuances of influences on PA that are in the literature are not well understood.

To explore these issues at depth, qualitative research is best placed (Rebar and Taylor 2017). This chapter of the doctoral research has also comprehensively reviewed and brought together literature from the qualitative research landscape in the field of SMI and PA. In doing so, this review has demonstrated that qualitative research is an effective approach for exploring far reaching biopsychosocial and environmental benefits for the individual with SMI that go beyond improving clinical recovery outcomes identified from more positivist research paradigms. In this regard, concepts such as the role of PA in the journey of recovery and the meta-perceptions of stigma, which are layered and nuanced issues not well captured in quantitative research investigation, become clearer and more understandable. The review of the qualitative research that was carried out as part of this wider critical review has shown that recent experiences of non-intervention PA have effects on mood, and regulating symptoms through a number of different mechanisms. In this regard, PA has been reported to help provide normal routines, and offer meaningful social interaction that would otherwise not occur (Cullen & McCann, 2014; Hodgson et al., 2011). It is clear from the literature discussed in this critical review that more qualitative research is needed which does not focus specifically on interventional PA so as to reflect real world experiences of PA that are not supported intensively. In this regard, qualitative research on PA experience from an Irish perspective would have context specific issues which may differ from other more well-resourced contexts. In this research project, a study using qualitative research is justified as broad issues highlighted as influencing factors from quantitative investigation require a more in-depth understanding from qualitative inquiry.

Furthermore it is now clear that a multidisciplinary perspective, including the input of management and carers and other ancillary MH service providers is critically important in gaining a comprehensive understanding of the multiple factors of influence on PA and developing PA programmes around these influences. These key stakeholders have been largely underrepresented from the qualitative literature in particular. Yet, this critical review has highlighted their importance in understanding complex issues from alternative perspectives. In the interest of a more broad aim to develop a PA programme, it would seem remiss to exclude such populations from any detailed informing research. This study presents an opportunity to bring together a diverse number of stakeholders which to date have been siloed in research.

Focusing on the overall research aim to develop a PA and SB programme for recovery focused services, this critical review of the literature has identified the PRACTIS guide as an appropriate roadmap tool, with four stages to follow for implementing PA programmes across settings (see Figure 2-3) (Koorts et al., 2018). The PRACTIS guide has been offered as a strategy suitable for MH settings to guide PA implementation (Deenik et al. 2019). The PRACTIS guide is theoretically informed by the SEM, which is applicable and widely used in PA and MH research. Ecological models balance the relevance of interpersonal, intrapersonal, community, organisational and environmental influence on behaviour. Ecological models are broad and do not seek to explain causal pathways between level factors, but rather indicate the presence of between level influence (Buchan et al., 2012). Ecological models are typically flexible to underpin quantitative and qualitative of varying epistemological positions.

While this research has the overall aim to develop a programme that may bridge the well discussed implementation gap, Deenik *et al.* (2019) highlight fundamental issues that must be addressed in their review of appropriate methodological steps for integrating lifestyle interventions into MH setting when adopting principles of the PRACTIS guide. These steps are: address multilevel barriers and factors of influence among key stakeholders; and utilise co-design principles to inform intervention development, helps to guide the objectives of this research project and affirm the suitability of the EBCD approach. The exact approaches taken to achieve on these steps are detailed further in this Chapter 3. This critical review puts forward an EBCD approach which has been identified as an appropriate approach to develop PA aspects of care through programme design making the case that future PA programme design and delivery ought to go further to embed service user centric and multidisciplinary participatory techniques to reflect best practice recovery principles in MH care. While EBCD has not previously been utilised to develop a PA programme in a MH setting or other settings (Matthews, Cowman, & Denieffe, 2017), it is nonetheless an approach which aligns well with the four key stages of the PRACTIS guide, thereby facilitating a process for PA and SB programme development that is in keeping with an evidence based practice for translation and implementation of PA. Other approaches to PA development in MH settings using co-design have not applied full EBCD methods and have not paid consideration to PA implementation and translation models (Wheeler, Roennfeldt, Slattery, Krinks, & Stewart, 2018). This critical review has examined EBCD, and it capacity to be modified for the design of PA programmes in MH care to effectively translate readily available context specific perspectives into suitable PA resources for people with SMI.

Chapter 3

An overview of research methodology

Chapter 3: Overview of research methodology

3.0 Introduction

This PhD research brings together a multitude of different research methods across three separate research studies that are located within one overall research project with an overarching aim. In this regard, these studies individually sit within gaps in the literature which are fundamental to address in order to comprehensively utilise EBCD for PA and SB programme development. In this chapter, the key research methodologies which are used to underpin this modified EBCD project are reported and discussed. This chapter also provides the reader with an overview of the study chapters to demonstrate their fit and importance within the overall study and its aim ‘to utilise a modified Experienced-based Co-design approach to develop a PA and SB programme that can be used within existing recovery focused MH services to provide and support appropriate and sustainable PA for people with SMI’. In this Chapter, the methods and methodologies for Study 1 (A), Study 2, and Study 3 are detailed. These methods combined make up the modified EBCD approach which has been used in this research to develop the MWRP.

3.1 Rationale overview of approach

Prior to the commencement of this research project, a needs analysis was carried out across the SECH region by the research team. See Chapter 1, Section 1.2 for expanded detail on this needs analysis process. In addition to the needs analysis, meetings were held with rehabilitation and recovery services across the SECH and the modified EBCD process was endorsed and supported by the South-East Mental Health Executive Management (HSE) in June 2015. This consultation and endorsement helped to define the appropriate approach and setting of this research. The input from the MH Executive also allowed the researcher widespread access to residential and non-residential rehabilitation and recovery setting across the region. While not explored within the primary research, this executive oversight no doubt contributed to multi-stakeholder buy-in in relation to facilitating the researcher on-site to carry out research.

The conceptual modified EBCD approach which served as the initial guide for the research project was published in peer-review academic research in 2017 (Matthews et al. 2017). This approach takes an iterative research approach spanning multiple diverse studies that has a unified theoretical underpinning but is also flexible to accommodate multilevel influences of policies, social structures, and environments within the Irish MH care context. The exchange between these multilevel areas is to be understood for effective PA programme development. A SEM is used in this research as it accounts for factors of influence across a broad spectrum of levels and allows for the incorporation of qualitative and quantitative research; other prominent frameworks such as the Transtheoretical Model of behaviour change and the Social Cognitive Theory traditionally sit within positivist paradigms in PA epidemiological research with the general population (Buchan, Ollis, Thomas, & Baker, 2012). In addition, the SEM also underpins the novel PRACTIS guide (Koorts et al. 2018) which can be used to inform PA intervention development with to bridge the PA implementation gap that exists in MH setting presently. To ensure that the EBCD approach will be effective in terms of bridging the PA and SB implementation gap in real world clinical settings, the PRACTIS guide has been applied to this current research in order to shape the necessary modifications (Koorts et al., 2018). The PRACTIS guide offers a linear and iterative process with inherent flexibility to allow intervention overlap and to meet context specific factors. In this research modifications have been made to the EBCD process in order to reflect the PRACTIS guide and thereby optimise to suitability of this approach, these are detailed later in this chapter. Based on this, and the consideration of the literature discussed in Chapter 2, a SEM underpins all aspects of this project, ultimately leading to the development of the *Move with Recovery Programme* (MWRP) through the final stages of co-design from a modified EBCD approach to service development.

3.2 An overview of methodology for included studies.

This research project takes a modified EBCD approach. In this section, the three primary studies which make up this research project are discussed with respect to their methodology and methodological fit within the wider research project to develop a PA and SB programme for outpatients accessing rehabilitation and recovery MH services in Ireland. The decision to adopt these three distinct studies, which should not be viewed in isolation from each other, have been taken following extensive consideration of the literature in Chapter 2. The literature to inform the reader in relation to the origins of EBCD is documented in Chapter 2, Section 3. Briefly, EBCD is an approach to improving health care services that merges overlapping strands from PAR, and User design theory, Learning theory, and Narrative Research (Bate & Robert, 2007; Robert, 2013). Traditional EBCD is a six-stage process (see Figure 2-2), that is usually seen to follow a process of: 1. Gathering experiences through observation and service provider and service user filmed interviews; 2. Identifying touchpoints (experience shaping moments); 3. Feeding touchpoints back to small co-design work; 4. Prioritising touchpoints by participants; 5. Bringing everyone together for co-design event; and 6. Carrying out a celebration event (Donetto et al., 2014; Robert, 2013). In this research project a modified EBCD approach was developed specifically and utilised to meet the project aims and objectives. The flexibility of the EBCD approach, which is open to modification, as shown in Chapter 2, speaks to its ease of use and applicability within numerous and diverse health setting.

3.3 Modifying Experience-based co-design approach

There are many examples of EBCD projects tasked with general service improvement having undergone modification to suit the context (Donetto et al. 2014). To ensure that the EBCD approach, which is traditionally a service improvement approach, will be effective in terms of bridging the PA and SB implementation gap in real world clinical settings, the PRACTIS guide was applied to this current research in order to shape the necessary modifications (Koorts et al., 2018). The PRACTIS guide offers a linear and iterative process with inherent flexibility to allow intervention overlap, and to meet context specific factors (Koorts et al., 2018). The PRACTIS guide puts forward four key steps for good PA implementation research. These are, Step 1: requires the researcher to describe proposed features of the proposed intervention. Step 2: of PRACTIS seeks to engage key stakeholders, ideally through participatory research methods. Step 3: of

PRACTIS looks to identify contextual barriers and facilitators to implementation. Step 4: of PRACTIS seeks to address the potential barriers to effective implementation. This overall modified EBCD project has been developed against this good practice of PA implementation research guide. Table 3-1 below, demonstrated where this modified EBCD approach to develop the MWRP fits in this regard.

Table 3-1. PRACTIS guide steps and corresponding studies within research

Steps in PRACTIS guide	Study phases fulfilling PRACTIS steps
Step 1: Characterise parameters of implementation setting	**Needs analysis**: Identify mental health service need and population requiring programme (*Chapter 1, 1.2*). **Critical review:** Examine relevant literature in the field to inform research methods and provide context of findings (*Chapter 2)* **Study 1 A & B**: Investigate current PA levels and key influencing factors of PA that occur within existing rehabilitation and recovery services (*Chapter 3)*
Step 2: Identify and engage key stakeholders	**Study 2:** Explore key stakeholder (SU, SP, management, and carers) experiences of PA in rehabilitation and recovery MH services (*Chapter 4)*
Step 3: Identify implementation barriers and facilitators	**Study 1 A & B**: Investigate current PA levels and key influencing factors of PA, including strength of barriers that occur within existing rehabilitation and recovery services (*Chapter 3)* **Study 2:** Explore key stakeholder (SU, SP, carer) experiences of PA in rehabilitation and recovery MH services (*Chapter 4)*
Step 4: Address potential barriers to implementation	**Study 3:** Carry forward outcomes from Study 1 A & B and Study 2 into facilitated multi-stakeholder co-design of *MWRP* (*Chapter 5*)

As shown, the current research project uses a modified approach to EBCD to develop the MWRP. In this regard, modifications were made to the EBCD approach, which were developed during the stages outlined in Chapter 1. In addition to modifications made to fit PA implementation research guides, modifications were also made to this EBCD approach to meet the needs of MH services and stipulations from the relevant Research Ethics Committees. Where this has occurred, it is discussed in the relevant section below.

A list of the modification from the traditional EBCD process for the current research is shown below in Table 3-2.

Table 3-2. Modifications applied to EBCD approach in current research project

Traditional EBCD methods	Current project specific modifications	Rationale for modification
No quantitative stage of data collection	Study 1 (Quantitative) included in project	Meet specific aims and objectives of overall research project Provide a rationale for *Move with Recovery* Characterise parameters of implementation setting (PRACTIS)
Integrated structured observation (non-participant observation)	Brief informal participatory observation “Close observation” (van Manen, 1997)	Project aim is specified, rather than general service improvements and so observation methods require less attention Observation methods adopted according to study positioning (van Manen, 1997)
Filming patients/service users	Audio recording and actor portrayals	Research ethics restrictions
Staff feedback/Patient feedback events prior to co-design	Omission of feedback events	Meet specific aims and objectives of project Study 1 and Study 2 data were brought forward into Co-design working in other ways. E.g. • Themes posters • Discussion topics for individuals /groups
Large Co-design meeting (Identify priorities), followed by smaller Co-design groups (Solution based work)	Integrated multistage co-design meetings (Identify priorities and Solution based work carried out sequentially)	Meet specific aims and objectives of project Time and resource restrictions

3.4 Study 1: An overview

In Study 1, located in Chapter 4**,** there are two main phases of primary research, Study 1 (A) and Study 1 (B). These studies are detailed as follows:

- Study 1 (A) is a quantitative study which has used self-report measures to examine PA levels and key influencing factors of PA for people in rehabilitation MH care.
- Study 1 (B) is a brief quantitative study using objective based measures of PA and SB to examine PA levels and SB of people in rehabilitation MH care.

As shown, Study 1 (A) has a dual purpose in examining PA levels (using SRQ), in addition to examining key influences on PA behaviour of people with SMI in the relevant context. Study 1 (A) is a result of the absence of literature that has examined PA levels or broadly taken a quantitative approach to examining the factors that influence PA for people with SMI in Irish MH services. This literature gap, while important to address generally in the context of this research, is also in alignment with Step 1 of the PRACTIS guide. Koorts *et al.* (2018) assert that early familiarisation with characteristics of the proposed clinical settings for implementation will support smooth implementation. These are: Step 1 of PRACTIS guide requires the researcher to describe proposed features of the proposed intervention. While the aforementioned needs analysis and subsequent critical review (Chapter 2) allowed for the foundation knowledge to inform the *MWRP* in relation to setting, target population, MWRP aim (increasing PA and reducing SB supported by a knowledge of the factors that influence PA and SB)., Study 1 (A) and Study 1 (B) provide the primary evidence for understanding the rehabilitation and recovery population in so far as addressing the literature gap on PA levels and factors that influence PA. This is a logical first sequential step to identify the context specific information on the PA and SB of people with SMI in Ireland and meeting PRACTIS recommendations.

Study 1(A) provides a quantitative study that examines the strength of PA barriers within key psychosocial domain areas of PA behaviour change in a sample (N=>100) people in rehabilitation and recovery. This research probes where less active people with SMI experience stronger barriers to their more active counterparts.

3.5 Study 1(A)

In addressing the first purpose of this study, to examine PA levels (with an SRQ), in addition to examining key influences on PA behaviour of people with SMI in the relevant context to examine PA levels of people with SMI in Ireland, the section below outlines methodological considerations taken. The merits of SRQs with respect to reduced participant burden have been explored in the critical review of the literature (Section 1, Chapter 2), At the time of writing, no consensus with regard to the appropriate SRQ to measure PA levels among people with SMI (Soundy, Roskell, et al., 2014). Validation studies for the most widely used SRQs, have small samples sizes and are therefore limited in their findings (Faulkner et al., 2006). Additionally, prominent tools, such as IPAQ may not be suitable for use with clinical populations by the nature of their intended design (Bauman et al., 2009). There is therefore limited guidance for tool selection to measure PA in MH populations. Based on the absence of certainty in the literature, we suggest tools which are used in other clinical settings to ascertain PA levels against guidelines may be applied in MH settings with caution. This research used the 3Question measurement tool (3Q) on PA developed by Smith *et al.* (2005). This tool was designed to decipher between persons that meet and do not meet the PA guidelines in clinical settings, and so is thought to have minimal face validity for this particular population. The clinical significance of the NPAG has been put forward in recent EPA guidelines as a threshold target for people with SMI (Stubbs et al., 2018). Brief item measures, such as the 3Q assessment may present an easy to use SRQ tool for examining a measure of PA that is outlined within EPA guidance as desirable to measure for the health of people with SMI.

While Study 1 (A) seeks to address the gap in the research with respect to PA levels of people with SMI in Ireland it does not endeavour to measure SB of this population. As already well documented in Chapter 2, SRQ measures do not adequately capture SB data among SMI populations (Soundy et al. 2014). Therefore, an additional Study 1 (B) has been added to this overall Study 1. This will be described in greater detail below (3.2.1.2).

To address the second purpose of Study 1(A), 'examining key influences on PA behaviour', this study utilised the Theoretical Domains Framework (TDF) (Cane et al., 2012), through the use of the Determinants of PA Questionnaire. The TDF structures psychosocial domains of behaviour change where barriers of PA are located. The TDF is a validated and integrative framework of domains that represent theoretical constructs of behaviour change (Cane et al., 2012). Importantly however, the TDF demonstrates factors that influence PA across the spectrum of levels within the SEM (Sallis et al., 2008), which underpins this research study during all stages of inquiry.

The application of the TDF to examine the strength of barriers to PA has given rise to the Determinants of Physical Activity Questionnaire (DPAQ) (Taylor, Lawton, & Conner, 2013). This validated instrument was used during Study 1A to examine influences on PA in the form of barrier the strength of barriers in key areas that are modifiable. The DPAQ has previously shown stronger barriers to PA for people with low levels of PA compared to those achieving the recommended guidelines across 11 domains (Taylor et al., 2013). The domain areas, which are shown below, are seen to fit levels of the SEM which have been described in detail in Chapter 2 (2.4.3). These domain areas are:

- Knowledge: An awareness of the existence of something (e.g. being unsure what to do in PA)
- Environmental resources: Any circumstance of a person's environment
- Motivation and goals: Mental representation of desired outcome
- Beliefs about capabilities: Acceptance of reality, truth or validity about talent or facility
- Skills: Proficiency through practice
- Emotion: Complex reaction involving experience, behaviour, and physiology
- Social influences: Interpersonal interaction resulting in changed thoughts, feelings, and behaviour
- Beliefs about the consequences: Acceptance of the truth, reality, and validity about outcome of behaviour
- Action planning: Conscious decision to preform behaviour
- Coping planning: Strategy and preparedness for challenge
- Goal conflict: Priority of PA in daily routine. Willing to make compromises. (Glowacki et al., 2017)

3.5.1 Study design

A cross-sectional, multi-site design was adopted. Convenience sampling was undertaken in rehabilitation and recovery MH facilities in Ireland (N=14); including, day centres (N=6) which encompasses multiple levels of service dependency, high/medium dependency community residential facilities (N=6) and low dependency community residential facilities (N=2). In this regard, high or medium support MH facilities indicate where 24 to 12-hour nursing care is provided in the MH facility to meet the needs of service users. Low support denotes visits to the relevant facility by the MH nursing staff on a needs basis.

3.5.2 Participants and recruitment

Participants were eligible if they were attending MH services for a diagnosed mental illness (ICD-10). All eligible participants were outpatient accessing rehabilitation MH services in the South-East Community Health Care (SECH) region for treatment of severe mental illness (ICD-10). In Ireland, rehabilitation and recovery MH services are characterised by diverse population groups, with long duration of illness, complex needs, and often resistance to treatment (Lavelle et al., 2007). In this regard, recruitment for Study 1 (A) and Study 1 (B) presented numerous challenges for the researcher. In Study 1 (A) service facilities from across the South-East region were being accessed and so the researcher spent a six-month period travelling between MH facilities to spend time with service user and service providers, providing Participant Information sessions, and assisting in questionnaire completion where requested. In this study, voluntary response sampling was carried out across rehabilitation and recovery facilities.

3.5.3 Procedures

An advertisement poster was initially used to recruit participants from a range of outpatient rehabilitation and recovery MH facilities in the relevant region of Ireland. In total n=14 separate rehabilitation and recovery MH facilities were accessed for this study during the period of data collection (shown below). The sites of data collection included a number of day centres across the region, in addition to high, medium and low supported residential facilities. Different colour survey questionnaires were administered to each site to geographically differentiate data collected. However, this colour coding was maintained as private and locked in WIT.

In each site, the researcher carried out an initial site visit where formal and informal information sessions were carried out with service users and service providers. During information sessions, all stakeholders were able to ask questions. In addition, a study advertisement for participation remained in each site, along with participant information forms for the duration of the data collection period (shown below). Blank surveys were also left at sites with a locked deposit box for service users to self–complete or complete the survey with the assistance of MH service providers should they wish. This process also included an extensive two-day observation visit at each where the researcher was able to become familiar with PA that is available structured or unstructured within each service. This process also allowed the building of rapport with service users and service providers at each site and contextual understanding for the researcher in supporting survey responses. This rapport also enabled service users to seek support from the researcher in completing the survey when required.

In addition to the above, the contact details of the researcher were left with the MH service providers so that participants could seek assistance from the external researcher should they wish. This was an informal process arranged on an ad-hoc basis with senior nurse management at each site. Bi-weekly follow-up visits to sites were carried out by the researcher where it was known that eligible participants expressed interest participating in the survey at a later date. While all persons residing or accessing rehabilitation and recovery sites were offered a chance of participation in the survey upon first site visit, participants that declined outright in visit one, were not approached again unless solicited. All eligible participants were also offered assistance in completing the anonymised questionnaire from the researcher. Participants that were offered the opportunity to participate verbally during information sessions were also reminded that participation was voluntary. Data collection took place from March – July 2016. A minority of participants self-administered the survey (5%). The majority were assisted to complete the questionnaire (95%) by request.

3.5.4 Ethical considerations

All participation in this study was anonymous, no names or identities were gathered on the questionnaire survey. The questionnaire explicitly stated that completion and submission of questionnaires implied consent for data to be gathered stored and used within subsequent research publication and the development of the *Move with Recovery* programme. Each of the participating centres had a minimum of four days with the researcher present to provide assistance to eligible participants. Where researcher assistance was provided, all surveys were assisted in completion in a private room in the respective facility with just the service user and researcher present. The researcher took due care to regularly check-in with participating service users to ensure that they were not becoming distressed throughout the process. Participants were also reminded verbally of their right to terminate the survey or skip questions at any stage. Participants were also encouraged to make contact with their key worker post-survey to ensure that individuals were protected from any adverse reaction from the survey.

Completed questionnaires were placed in a locked storage box, which remained within the MH facility where data was being collected between 9am and 5pm, as to not leave questionnaires on-site overnight. The secure box was stored in Waterford Institute of Technology in a secure filing unit in the Nursing Post Graduate Office. De-identified hard copy data was retained in a secure filing unit in WIT.

3.5.5 Data collection tools

Demographic data was collected by a series of questions about gender, nationality, relationship status, mental health diagnosis, physical comorbidity, medications, and type of residence (high, medium or low dependency facility) which served as proxy indicator of illness severity.

3.5.5.1 Physical activity measurement

A number of SRQs were proposed in a consultation with representatives from the mental health services in SECH. Based on face validity, the decision was made to use a brief item measure of PA, specifically the 3Q physical activity assessment. It was believed that the minimal associated participant burden of the 3Q assessment was desirable in the context of the study outcomes as previous brief item measures have been shown to be effective in reducing participant burden (Marshall, Smith, Bauman, & Kaur, 2005). The 3Q allows for the calculation of scores to screen participants against PA guidelines (Smith et al., 2005). To the knowledge of the researcher, the 3Q PA assessment has not undergone validation in a SMI population previously. However, in general populations, this SRQ shows moderate test-retest reliability, moderate concurrent validity, and fair criterion validity (Smith et al., 2005).

3.5.5.2 The barriers to physical activity

The Determinants of Physical Activity Questionnaire (DPAQ) was used in this research study. The DPAQ domains represent key theoretically informed domains of PA behaviour change (Michie, Johnston, Francis, Hardeman, & Eccles, 2008; Taylor et al., 2013). The DPAQ allows for examination of the strength of barriers to PA in key psychosocial domains that represent theoretical constructs of behaviour change. The DPAQ does not identify barriers to PA specifically in relation to lack of support from MH professionals; a key barrier in meta-research (Firth et al., 2016). Therefore, following a small pilot study (n=3) with two MH service user and a MH service provider, a 7-point Likert style question was added: ‘My mental health team support me to do physical activity’. A full version of the DPAQ is shown in Appendix 8. Details of data analysis carried out during Study 1(A) are found in Chapter 4 (4.3.5).

3.6 Study 1(B)

Study 1 (B) largely follows the same methodological route as Study 1 (A) in so far as it is a supplementary data collection and analysis phase of research adopting the same positivist position, underpinned by the SEM. This study provides the primary evidence for understanding the rehabilitation and recovery population in so far as addressing the literature gap on PA levels. However, while Study 1(B) provides the first objectively measured data on PA levels of people with SMI in Ireland, its value is most prominent with respect to measuring SB for this population, which were not achieved using SRQ data in Study 1(A). Again, this is a logical sequential step to identify the context specific information on the PA and SB of people with SMI in Ireland as per PRACTIS recommendations. Carrying out OBM of data collection was particularly important in measuring SB on account of poor sensitivity of SRQs in measuring this for people with SMI (Stubbs, Firth, et al., 2016; Stubbs, Williams, Gaughran, et al., 2016)

While Study 1 (A) and Study 1(B) are related in their primary aim, there is noticeable difference in the research procedures with respect to the methods carried out for each. For instance, Study 1(B) was conceived out of wider collaboration with researchers in University of New South Wales, Australia. The data obtained in this study also contributed to a wider validation study for the SIMPAQ questionnaire (Rosenbaum & Ward, 2016). Upon commencing this PhD research in 2015, a lack of availability of OBM precluded their use from the initial project design. However, the researcher’s engagement with the SIMPAQ International Validation Study afforded the opportunity to engage with OBM thus providing key SB data for the population of interest. In 2016, contact was made by the researcher with the School of Psychiatry, UNSW to engage with the

SIMPAQ validation study. Following this, five tri-axial ActiGraph GT3X + accelerometer (*ActiGraph, LLC, Florida*) devices were sourced from UNSW. Based on the limited number of available devices, it was decided that data collection would be confined to one county within the SECH region.

Study 1 (B) aimed to measure PA and SB levels among a small sub-sample of outpatients with SMI in rehabilitation and recovery MH services using OBM. This data would be used to further provide contextual understanding of the PA behaviours of people accessing these services to assist in the development of the MWRP.

3.6.1 Research design

This study utilised a cross-sectional design to objectively measure SB and PA levels of people with SMI in rehabilitation and recovery MH service in just two counties in the south east of Ireland. This measure reduced sampling strategy on that of Study 1(A) was implemented on account of limited data collection tools available, as outlined in the previous paragraph. The two counties were chosen based on the most mental health teams that showed the most proactive engagement with the research study as this was believed to be a facilitator of data collection.

3.6.2 Participants and recruitment

A convenience sampling strategy was adopted. This was a necessary step to mitigate the risk associated with heightened anxiety or paranoia that may have arisen from wearing the accelerometer device. In recruiting participants for Study 1(B), gatekeeper service providers were relied upon to identify service users in their facility which may be suitable for this study. This was a stipulation placed on the research at the point of ethical approval. Participants were eligible if they were attending outpatient rehabilitation MH services for a diagnosed mental illness (ICD-10) within the designated counties for data collection. All participants continued to receive usual care during this study which included combinations of pharmacological psychotherapy and any lifestyle interventions that would usually take place such as PA. Participants were excluded where evidence of significant cardiovascular, neuromuscular or endocrine disorders limiting regular ambulation (as per American College of Sports Medicine absolute contraindications to exercise) were present. Participants were also excluded in the case of having diagnosed anorexia nervosa or bulimia, or in the case of an organic brain disorder; estimated IQ < 70 or MoCA score <=26. Some people with SMI may score less than 26 on the MoCA as a consequence of the illness rather than indicating a separate neurocognitive disorder. When the score indicates a separate neurocognitive disorder, this would lead them to be excluded. Participants were also excluded when if they were experiencing acute paranoia. Due to anonymity measures implemented during Study 1 (A), it was not known if participants of Study 1 (B) had been prior participants of this research study.

3.6.3 Procedures

Data were collected in just one county in the SECH region for Study 1(B). To recruit participants, advertisements were placed at each facility where participants were being recruited. In addition, a gatekeeper (Nurse/OT) was identified within each facility where data was being collected. This individual assisted in the recruitment of volunteer participants by identifying suitable participants that could be approached by the researcher. In this way, eligible service users were approached and provided with information on the study procedures and purpose and informed consent documentation. Participants were then asked to take a period of contemplation after which they were asked to indicate their intent to participate with their MH key worker. This key worker then made contact with the researcher, who returned to the relevant MH facility to collect the signed consent form and commence data collection. The aforementioned key worker provided as a co-signatory on informed consent documents. Each gatekeeper also received information on accelerometers wear-time management (e.g. fitting device, instructions of when to remove device) when contact was first made with services. This was done in order to support the service user should they have requested. Eligible participants were issued with an Information Sheet (Appendix 9) and an Accelerometer

Information Form (Appendix 10) and a verbal explanation of the procedures and their right to withdraw. All participants were required to provide Informed Consent before taking part in the study (Appendix 11). This informed consent was stored in accordance with WIT's records retention policy. Data collection was localised to two counties (as per restrictions in number of available devices). Within this area, specialist rehabilitation and recovery MH service day centres (N=2) and high support residential facilities for rehabilitation service users live (N=3) were accessed to obtain a sample.

3.6.5 Data collection tools

Specific demographic data on participants were obtained using the SIMPAQ Demographic & Diagnostic Sheet (Appendix 12). Demographic variables measured included sex, living situation, education, employment status, smoking status, psychiatric diagnoses, somatic co-morbidities and medication usage. In addition, height and weight measurement were taken with the assistance of on-site nursing staff where consent had been provided. Physical activity and sedentary behaviour were measured using a tri-axial ActiGraph GT3X or GT3X + accelerometer (*ActiGraph, LLC, Florida*) which is a small, hip-worn device for objective measurement of PA and SB. Accelerometers were placed on the right hip using an elasticated strap that could be worn underneath or out of clothing. All participants received instructional demonstration in wearing the device in addition to the written instructional information. Participants were asked to hip wear an ActiGraph accelerometer for 7 days (minimum requirement of 3 days wear, with the exception of bathing and swimming). Willing participants were issued with an Accelerometer Information Form (Appendix 10). All accelerometer devices were fitted/distributed by the researcher following protocols of the SIMPAQ validation study at SIMAPAQ.org. Accelerometers were initialised and calibrated using ActiGraph's Centrepoint software according to SIMPAQ validation study protocols. Prior to commencement of accelerometery, participants were asked to complete (assisted by researcher) the SIMPAQ Demographic & Diagnostic Sheet and the Montreal Cognitive Assessment (MoCA). This data, along with anthropometry measures, were anonymised and inputted into Centrepoint against participants' accelerometery data. Participants were also issued with seven small alcohol swabs to clean the devices each day. All participants were in receipt of usual care during accelerometery; this may have included structured or unstructured PA for some participants. Data were extracted using Centrepoint and analysed using ActiLife v6.11.5 software. ActiGraph devices were initialised to record data at specified time intervals (epoch) of 10 seconds as per the protocols in the SIMPAQ Validation Study. Details of how Study 1(B) data were analysed is found in Chapter 4 (4.8.5).

3.6.6 Ethical considerations

Prior to commencing data collection, participants were provided with a Participant Information Form (Appendix 9). In addition to this, all participants were given detailed verbal explanation of the procedures and purpose of the research. This included information on wearing the device and their rights to withdraw at any time. All participants provided informed consent prior to wearing accelerometer devices (Appendix 6). In addition, the ethical stipulations of this research required all participants to have consent forms signed by a third-party key worker or family member prior to participation to ensure capacity to consent. In cases where the latter of these occurred, the individual's key worker was notified of the individual's participation in the research study. This written information also contained contact information for the lead researcher in case participants had queries in relation to accelerometer devices. All data collected during this study were anonymous. There was no special consideration made with respect to gender, as devices could be operationalised underneath or out of clothing depending on the individual's choice. Data were stored on password protected WIT computers using Centrepoint software. Questionnaires were stored in a secure filing unit in Waterford Institute of Technology. Further details of ethics committee approval are found in Chapter 4.

3.7 Study 2

Study 2 presents the “Gathering experiences” component of the EBCD approach. However, Study 2 also present as a stand-alone research study. While this overall research presents an EBCD approach per se, a number of specific modifications to the EBCD process have been adopted which are found in methods used in Study 2. These will be discussed in the subsequent section. In this regard, themes and “touchpoints” identified during this study are taken forward to Study 3 (Co-design) to directly influence the development of the MWRP. The Background and results of Study 2 is found in Chapter 5. This is a qualitative multi-stakeholder exploration of the experiences of PA structured and un-structured within rehabilitation MH services. This inquiry is grounded in an interpretivist epistemology and underpinned with hermeneutic phenomenology. This study includes the experiences of multiple stakeholders not well represented in the literature.

3.7.1 Research design

In planning this research study, a number of epistemologies and paradigmatic positions were considered, each with respect to the wider EBCD project being undertaken and the current aims of this research study. While Study 1 provided broad contextual information of PA and Sb behaviours, this study aimed to explore experiences of PA and SB as it occurs in structured and unstructured forms within outpatient rehabilitation MH services for people with SMI from a multi-stakeholder perspective. This focus on experience moves phenomenology to the fore as an eligible research methodology, which is in line with the “gathering experiences” component of EBCD

Phenomenology is the study of human experience and the way experience is perceived in the conscious (Tuffour, 2017). Phenomenology is a discovery orientated science and philosophy interested in mining and exploring the meaning of experience, free of assumption (van Manen, 2007). Within phenomenological research, there are variances however. These include descriptive hermeneutic and Interpretative Phenomenological Analysis (IPA). Descriptive phenomenology, influenced by Husserl is characterised by epoché and bracketing, which endeavour to position the researcher in a place of ambivalence or neutrality. As a contrast, the hermeneutic approach accepts the position of the researcher and the lens with which they bring. The research paradigm applied in Study 2, discussed here (interpretivist epistemological, underpinned with hermeneutic phenomenology) also bears relevance throughout the remaining sections of this EBCD approach. It positions the researcher in terms of ontology and epistemology throughout. A paradigm represents a first principles viewpoint from which the one perceives the nature of the world and their place within. Accordingly, the positions taken here fit within the root paradigms which shape EBCD (Robert, 2013). The reader is directed to Section 3, Chapter 2 for greater detailed discussion of phenomenology and its place within the EBCD approach this.

3.7.1.1 Theory

In the context of this research, the Social Ecological Model (SEM) (Sallis et al., 2006, 2008), still provides an overarching framework from which inquiry is based throughout this research project. In this study, the SEM is used to shape a topic guide for semi-structured interviews (Appendix 16). The SEM is a broad multilevel framework showing where factors that influence PA occur. While this framework appears a linear and simplistic approach for explaining behaviour, the application of the SEM requires an understanding of the complex interplay between levels of influence (Buchan et al., 2012). In this sense, this research aims to understand experiences of PA that occur within ecological levels of Intrapersonal (individual), Interpersonal, Organisational and Community, Environment, and Policy levels of influence.

With the influence of the SEM in place, this factor, it could be argued impinges on a purist phenomenological position. In descriptive Husserlian phenomenology, preconceived bracketing of researcher biases directly conflict with the presence of the SEM influence in so far as the research inquiry is structured (Laverty, 2003). As such, this approach is not suitable. Similarly, it is arguable that a complete IPA approach would not align to research already influenced to a degree by theory. IPA is restrictive in that it is inherently idiographic (Tuffour, 2017). Broadly speaking, a complete IPA approach to qualitative research is applicable to study-lived experience by forming and describing the experience without preconceived influence from theory (Smith & Osborn, 2015). Instead, an interpretivist position, underpinned by van Manen (1997) hermeneutic phenomenology was adopted in this current study, similar to that seen in Hargreaves et al., (2017). An interpretivist epistemology maintains that humans are considered complex and diverse beings with behaviours and attitudes that are shaped by influences that extend beyond that of fixed and stable reality external to the agent. Interpretivist positioning is interested in understanding human behaviour and interpretations of reality from the point of view of participants in the world, as opposed to an objective view of worldly reality (Green & Thorogood, 2018).

Hermeneutic phenomenology is by its nature an interpretive phenomenology; hermeneutics being the theory and practice of interpretation. In this approach, the researcher or investigator could not objectively separate themselves from the agent of study, and thus interpretation is a fundamental tenant of hermeneutic phenomenology. That being said, it must be remembered that Hermeneutic phenomenology is descriptive of lived experience (phenomenology), but also it is assumedly interpretative (hermeneutics) in so far as experience must be mined by the researcher (van Manen, 1997).

3.7.2 Procedures

Prior to data collection for Study 2, the researcher spent 6 months travelling between services to during data collection for Study 1. While this process was not classified as formal observation methods, it nonetheless allowed the researcher time to embed with services and to obtain a contextual understanding of PA and SB within the rehabilitation and recovery setting, thus providing an informal observation period. This process was particularly relevant in the context of the outside researcher from a non-clinical background.

Stratified convenience sampling was used to recruit multidisciplinary participants to the study. In the current research, a criterion sampling strategy was implemented to ensure the inclusion of key stakeholders not well represented in the literature were among the sample (e.g. peer support worker, psychiatric doctor, family member etc.). The study was advertised in all relevant outpatient rehabilitation MH services facilities across two counties in the South-East of Ireland that had participated in Study 1 (B). This was done to reflect a more in-depth exploration of experiences of service, and so the reach with regard to the sample was limited to a local area. Again, the areas were chosen based on positive engagement during the needs analysis stages (See Section 3.1). Gate-keepers (senior onsite MH staff) at identified sites were notified of the research and asked to give informal verbal information of the research to eligible service user and service providers working in in their local service/facility. Gate-keepers were encouraged to inform eligible participants that were interested and eligible for participation. Eligible participants were provided with an Information Form for service user or service provider (Appendix 10). The Information Form contained information about the research protocol and procedures involved. In addition, the Information Form contained contact information for the researcher (EM) for participants to make follow-up contact.

3.7.3 Participants and recruitment

Eligible participants in the sample were from all relevant stakeholder roles, including MH service users, MH nursing staff, Management, OT, Medicine/Psychiatry, Peer-Support Workers and Family Carers/Carers. Eligible participants were invited to make to make an appointment with the researcher to attend an interview at a location (within MH facilities) and time of their choosing. This was achieved from participants viewing the advertisement or asking the researcher directly during information sessions. Service user participants that engaged with Study 2 were from a range of high, medium and low support residential facilities across the two counties. Information on eligibility and criteria are listed below, Table 3-3. Exclusionary criteria included: Persons in crisis at the time of study, not possessing capacity to consent (co-signed/service provider)

Table 3-3. Inclusion criteria (Study 2)

Service user	Service provider	Carer
• 18-65 years old • SMI diagnosis (ICD-10) • Attending SECH rehabilitation MH services	• 18-65 years old • SECH rehabilitation MH services employed	• 18-65 years old • Currently caring for service user in rehabilitation MH services

3.7.4 Data collection measures

In carrying out data collection during Study (1) of this research project, the researcher also carried out brief observation of daily routines in relation to PA and SB of two rehabilitation day centres which helped contextualise information during interviews. This was an informal process of non-participatory observation or ‘organisational loitering’ and note-taking was carried out ad-hoc as opposed to following a systematic approach. The informality of the approach afforded the researcher the opportunity to engage in PA with service users, much akin to ‘close observation’ methods (van Manen, 1997). While this is a deviation from the traditional EBCD methods, it is argued that the observation methods used were still useful in providing context for the researcher as advocated as part of the *Gathering Experiences* phase of EBCD (Bate and Robert, 2007 pg 88).

One-to-one interviews were carried out by the researcher with all participants using an audio Dictaphone (Tascam DR-40). Semi-structured interviewing aligns with this interpretive phenomenological positioning, allowing the researcher to develop rapport with the participant, freedom to probe phenomena that arise, and allows the interview to deal with the participants’ interests or concerns (Smith, 1996b). In keeping with methodologies that are phenomenologically informed, photo-elicitations were used in the exploration of individual experiences of PA. Visual methods, specifically autography (participant takes photos for use) and photo-elicitation (visual material use to create discussion) are growing in popularity in MH research. Such methods can evoke memories and emotions attached to experience to help the participant explore and describe an experience that would not otherwise be achieved through spontaneous dialogue where contextual detail may lack, or where an individual may have difficulty expressing their experience (Glaw et al., 2017). This has relevance in the current context where communication challenges have previously been reported in exploring experience of activity during poor mental health (Hodgson et al., 2011). Photo-elicitation has been used similar research to this study, but in the context of metaphor to prompt discussion of activity meaning (Pickard et al., 2017). In the current research, photo-elicitation was used across all interviews to provide context and understanding of the specific experiences being explored. This was done to support participants in verbalising and expression, which was anticipated among service users accessing rehabilitation and recovery care (Lavelle et al., 2007). Each interview commenced with an open-ended discussion about experience of activities shown in the images, or activities of a similar nature. The images shown were a large non-competitive group activity (e.g. parkrun); sport (indoor soccer); active transport (cycling); structured exercise (gym equipment), See Figure 3-1 below for diagram.

The interviews began initially with broad discussions on PA experience using photo-elicitation (discussed above), followed by a number of open-ended questions about experiences of PA (from the perspective service user engagement or service provider support) from the beginning of engagement with activity, right through to completion of activity. Follow-up questions from a topic guide (Appendix 16) were then asked about different aspects of service users' experience of structured and unstructured PA in MH care but using an inquiry framed by domains of a Social Ecological Model of PA. In doing so, inquiry probed experiences of PA participation across a range of levels that may influence PA experience, including the Individual level, Interpersonal level, Organisational and Community level, Environmental level and the Policy level; levels that are congruent with a Social Ecological Model of PA (Sallis et al., 2006). The topic guide was then adapted to explore service provider and carer experience of involvement and support of PA in rehabilitation and recovery settings in the same manner.

Both the topic guide and the photo-elicitation piece were piloted with a MH services PSW (representing MH service users) and a MH nurse (representing MH service providers). Both measures indicated good face validity during piloting. A detailed description of the analysis process is shown in Chapter 5 (5.3).

Figure 3-1. Photo-elicitation resource

3.7.5 Rigour

Rigour within qualitative research refers to the trustworthiness of data gleaned from participants. There are four areas of rigour which require consideration in managing qualitative inquiry. These are: Credibility, Transferability, Dependability and Confirmability (Guba and Lincoln, 1982). These four areas are explained in each relevant section here below where details are given with regard to steps taken to maintain rigour of this research. Credibility in this sense relates to internal validity of data gathered (Guba and Lincoln, 1982). This research used a number of methods in order to maintain the rigour throughout inquiry and analysis of data. With respect to credibility, this research utilised pilot testing of interview topic guides and photo-elicitation material with service provider and service user volunteers prior to data collection. In doing so, no comprehension issues were identified that might inhibit the credibility of data from interviews. Furthermore, the use of photo-elicitation, is in itself, a measure that strengthened the credibility of data collected during this research. The photo-elicitation exercise ensured a consistency of comprehension was carried through all interviews. In addition to this, using field notes, all data were checked at the end of interviews to ensure that researcher interpretation of meaning was correct. Lastly, content that arose during service user interviews were discussed with the PSW, in the final interview to provide additional confirmation over the validity of data.

With respect to transferability, which in a sense relates to external validity of qualitative data (Guba and Lincoln, 1982), there are limited ways in which this particular type of phenomenologically informed inquiry might make claims regarding its transferability. In many respects the experiences explored in this research appear largely novel on account of nuanced contextual factors that occur across geographical and treatment contexts. That said, the small amount of qualitative research that has already been conducted in Ireland to date, (Cullen and McCann, 2014; Iwata et al., 2016) demonstrates that there is much consistency and overlap with respect to experiences explored in relation to PA. More work in relation to the experiences of MH service providers is needed.

Dependability relates to replicability in the context of naturalistic qualitative inquiry. Phenomenologically informed research can encounter challenges in meeting criteria of rigour in this regard patient experiences explored are unique and may develop spontaneously. In this current research the use of a topic guide framed by the SEM allows for some dependability with respect to a consistency of inquiry approach regardless of external alterations. Further to this, all interviews were subject to audio recording and note-taking, so that accurate 'Trigger films' could be generated from the data. This required the researcher to revisit notes taken at the end of each interviews with participants to ensure that issues raised were understood correctly. Further to this, all data collection methods and data collected were subject to monitoring and audit from the research supervisors.

Finally, confirmability was also considered within the methods of this study. All data collected was subject to complete audio transcription to allow easy working of the data. These transcripts were then uploaded to Nvivo software support structured thematic analysis (Braun and Clarke, 2006). Nvivo allows the researcher to interact with the data to manage and organise it by code and theme, to graphically display data and to report directly from the data (Bergin, 2010). Therefore, the data analysis process in this research has strong confirmability.

3.7.6 Ethical considerations

A number of key measures were implemented in order to meet the requirements of the two relevant Research Ethics Committees that provided approval for this research. All participation in Study 2 was anonymised and audio transcripts were de-identified. Service user participants were required to have third party signature from a MH key worker to indicate that capacity to consent was present. All participants were provided with a Participant Information Form (Appendix 10). This Information Form provided detail of the research aim, procedures, management of data and risk of distress protocol. Service user participants had the option to agree for the use of their interview transcript during

Study 3. Similarly, service user participants could opt out of this if they chose. This option was verbally explained to participants and reflected in the consent process. The researcher's contact information was also provided to facilitate participant change of mind. All interviews were carried out in relevant MH facilities in a private space. Participants were reminded of the use of audio-recording and their right to not participate in this. Participants were also verbally reminded about the limitations of anonymity that arose from this research, whereby complete anonymity was not guaranteed. Furthermore, participants were reminded about the research ethical responsibility to report criminal or harmful risk. A number of support options were displayed on the Information Forms provided to participants. In addition, participants were also encouraged to seek support from either their employment assistance network or their mental health team post-interview should they so need.

All audio files were stored on a password protected WIT computer. In addition, hardcopy data were stored in secure filing units in the Department of Nursing, WIT in accordance with WIT records and retention policy.

3.7.7 Reflexive comment

Considering the double hermeneutic inherent within hermeneutic phenomenology, which has been described as the researcher making sense of the participants' sense making (Tuffour, 2017), researcher reflexivity is considered very important in this current research, although poorly demarcated in other phenomenological studies of a similar nature (Johnstone et al., 2009; Pickard et al., 2017).

Considering the epistemological positioning of the current research, the researcher carried out data analysis cognisant of the fact that the experiences shared during interviews were shared between a person within the MH rehabilitation services, either service user, service provider or carer and the researcher who was a noticeable 'outsider' that was tasked with a project that ‘sought to develop a programme for the rehabilitation mental health services’. The overarching aim of the research project: ‘to develop a programme for the rehabilitation mental health services’ was explicitly stated to participants in their informed consent. This issue alone has connotations of an inadequate status quo and is likely reflected in the interview content among some. The researcher presented as a mid-20’s male with an interest in PA and presented in a professional appearance with approval from each local multidisciplinary team. As such it could be perceived that the research was stemming from services under the guise of service improvement and so again, the implication is here of challenging the status quo. The photo-elicitation is a useful mechanism by which this can be overcome as in many cases it triggered a memory of a positive experience of exercise or PA.

The role of the ‘external’ researcher is commonplace in the qualitative literature on experiences of physical activity and mental health populations (Mason and Holt, 2012; Soundy *et al.*, 2014). There are few examples in the literature where the researcher has been also a service user; to the authors knowledge, only one study has utilised this approach to date (Crone & Guy, 2008). Taking this approach has been postulated as an effective strategy in making the service user more comfortable and therefore more open to discussion during interviews.

In an effort to minimise the limiting effect of the ‘outsider’ researcher, the lead researcher spent time attending numerous sports and exercise sessions in rehabilitation mental health facilities where data was collected. This informal observation (detailed further in 3.7.2) was carried out during Study 1, and so was part of the data collection process of this study. As such this observation was not subject to ethical approval, but rather reflective learning on the part of the researcher. This informal observation is believed to have assisted in making all participants more comfortable and informed as to the research objectives during interviews. Engaging in this type of informal observation is considered a favourable methodology in research grounded in phenomenology (van Manen, 1997). In the writing of van Manen (1997), this type of observation is referred to as *close* *observation.* The concept of close observation, which is informal and participatory, is that the ‘outsider’ researcher can gain rich contextual understanding of the phenomena by entering the lifeworld of participants in their experience of the phenomena being studied. Additionally, observation methods are also advocated for in EBCD approaches, the relevance of the observation methods discussed here will be discussed subsequently in Chapter 5. The researcher logged key experiences, comments, and field notes during and post interviews. These notes were used during the interpretive analysis of data to assist in contextualising the findings. This was particularly relevant in the context of data obtained from multiple data sources, each bringing their own background, understanding and knowledge of PA, SB and exercise to interviews.

3.8 Study 3

In this section the details on the methods for Study 3, which includes co-design methods are discussed in detail. This co-design process was the final stage of the modified EBCD process which was used to develop the MWRP. The background and findings to the final Study 3 are located in Chapter 6. Chapter 6 also outlines the methods and findings of a brief evaluation of this Co-design phase of the modified EBCD process.

The co-design component of the EBCD approach extends the role of service user inclusion far beyond tokenistic service user inclusion efforts which are sometimes championed in the literature for good practice (Beresford & Croft, 2004). Bate and Robert (2007), argue that true co-design requires service users take up a partnership role with other stakeholders. In achieving such a balanced partnership between participants, and indeed the researcher(s) is arguably where PAR methodologies emerge again as prominent within the approach. While a diverse area of research, PAR approaches bring about a sense of journey for participants, bringing them through stages of exploration, knowledge construction and action. Such a process leverages critical reflection and between-group dialogue. It is this dialogue and reflection which gives participants a sense of ownership of a research project and investment in the outcome (McIntyre, 2008). This, in a sense describes a co-construction of knowledge for social change process, a process that speaks to equal power relations between participants, and therefore differentiated from mere tokenistic inclusion. Design sciences are also explicitly named as having influence on the EBCD approach, yet this influence is broad and not positioned within a specific theory (Bate & Robert, 2007). Bate and Roberts assert that valuable lessons can be learned from such areas, lessons which have been reflected upon and integrated into the EBCD approach, in terms of good design. Design sciences bring a new and pragmatic scope on using experience for health care. Techniques such as modelling and prototyping are borrowed (Robert, 2013). These philosophical roots which contribute to the EBCD design are also discussed in more detail in Section 3, Chapter 2.

3.8.1 Research design

The MWRP is designed to overcome the PA implementation gap between research and practice that exists presently in MH services. A four staged facilitated multi-stakeholder co-design process was undertaken over the course of 5 weeks, allowing for a 5-day break period in between. This process drew from the work carried out during the '*Gathering experience'* phase of this research project which is largely made up of work carried out in the previous Study 2, but also Study 1, in relation to establishing context and its role in informing Study 2.

3.8.2 Participants and recruitment

Similar to Study 2, participants in Study 3 (Co-design) were all deemed eligible if a relevant stakeholder of the rehabilitation and recovery MH service (See Table 3-1 for Inclusion Criteria). As with study 2, participants were eligible if they were attending rehabilitation and recovery MH services in the designated county involved chosen for Study 3. In this instance, Study 3 was undertaken in a different geographical location to Study 2 in order to protect the anonymity of service users that had agreed to have their trigger film used during Study 3. Further to this, as per terms of the needs analysis established at the beginning of this research project, a Recovery College was also included as a setting from which a sample for Study 3 could be drawn. Study 3 was advertised within the local Recovery College and in two rehabilitation and recovery MH centres that were not involved with Study 2 and located in a different geographical area. Similar to Study 2, the researcher visited appropriate sites (day centres and Recovery College) and distributed an advertisement in addition to Participant Information to eligible service users and service providers that were interested. Participants were invited to make to make contact with the researcher to join the Co-design group. This was achieved from participants viewing the advertisement and making contact on their own, or with the assistance of a service provider. Service user participants that engaged with Study 3 were all from low support residential facilities or community dwelling across the two counties; no service user participants from living in high or medium support facilities engaged with this research.

In adopting this convenience sampling strategy MH service users and service providers were recruited by making contact with the researcher and declaring interest in participation. Once a suitable number of participants had declared an interest, a further advertisement was distributed among the relevant facilities which displayed the day, time and location of the first meeting of the Co-design group. The group was then formed based on the eligible and willing participants (*n*=14) that turned up to this first meeting. In this regard however, many service users and service providers were from the same MH facility and so this process was served well by group attendance. Details of the participants that attended each individual co-design session are shown in the Results section of this Study (See Chapter 6).

3.8.3 Procedures

Study 1 and Study 2 (Chapter 4 and 5) contributed to the *Gathering Experiences* phase of this EBCD project as previously shown. In doing this, both contributed varying amounts towards Co-design (Study 3). While the findings from Study 1 were used to provide contextual support to co-design working, Study 2 was used to specifically inform co-design work through the use of "touch point" trigger film.

The interviews used in the '*Gathering Experiences'* stage of the EBCD approach were conducted as part of Study 2 (See previous Section 3.7). In addition to the in-depth-exploratory research carried out during this Study, experiences were also gathered in the form of 'Touchpoints'. These are defined as experience shaping moments that define a persons' experience of a service, and hence are more descriptive in nature (Bate and Robert, 2006). In collecting this data, the one to one interviews with service user participants which had been previously subject to transcription and multiple reads of data (Section 3.7), were subject to a further surface level thematic analysis as of Braun and Clarke, (2006). This was done to search for 'touchpoints' in the data. These touchpoints are listed in Table 3-2 below.

Following this analysis, a professional actor was commissioned to carry out service user only interview re-creation. To do this, the actor was provided with anonymised transcripts and anonymised audio file exerts to familiarise with the data. Re-creations of each service user interviews were conducted with the professional actor and the researcher (playing self). The re-created interviews films were edited using Visio 2016 software to develop a 20-minute master film that showed interview exerts capturing and focusing in on 'touchpoints' identified in prior analysis and other salient themes identified in the findings of Study 2 (see Chapter 5). The trigger film was edited to display touchpoints in a sequenced narrative. In this regard, PA stories were displayed from a beginning of activity towards the end of an activity where possible. In addition, editing was carried out to anonymise the actor and thus portray a real service user's experience. A visual still of the trigger film can be seen in Figure 3-2.

Table 3-4. Touch points identified in service user interviews

Touch points (SU)
1. Starting a new PA/Exercise programme in the mental health services
2. The enjoyment from taking part in a programme
3. Physical benefits from taking part (Sleeping better, losing weight etc.)
4. The knowledge that staff impart on PA/Exercise
5. Getting transport to PA programmes
6. Having to rely on staff to come deliver PA programmes
7. When someone uses the “word exercise”
8. My poor physical health makes it hard when I’m exercising
9. The MH facility makes it easy to be sedentary

Figure 3-2. Still image of the Trigger Film (Actor portrayal)

As with service user one interviews (discussed above), in-depth interpretivist analysis in Study 2 with service provider interviews were also supplemented with a broad semantic thematic mapping exercise which was carried out in order to identify ‘touchpoints’ by in relation to service provider interviews’ (See above for information on touchpoints) In this regard methods of Braun and Clarke (2006), were used again to develop and identify these

Touchpoints. The touchpoints that were generated were then displayed onto a visual poster for use in discussion work during Co-design session 3 (Section 3.8.3.4). A list of these generated touchpoints is displayed in the Table 3-5 below.

Table 3-5. Touchpoints identified in service providers interviews

Touch points (SP/Carer)
1. No access to exercise professional 2. I'm not trained to deliver PA 3. The on-site equipment makes it easier to be active 4. PA is better when staff that take part 5. People are stuck in their ways 6. People just sit all day "that's their routine" 7. Medication and mental illness make it hard to be active

3.8.3.1 Co-design Overview

In this section the broad steps taken during each of the four co-design sessions are outlined. Each co-design session was framed by individual aims and objectives that are outlined at the start of each section shown below individually across the four sessions. The process was divided up over four sessions following consultation with the recovery college that were providing the space for co-design work. The recovery college has considerable expertise in delivering multi-stakeholder group programmes and so advice was taken with regard to the most suitable number of sessions to sustain participant engagement. In this regard, it must be noted that no participant was offered incentives to participate in the process.

Co-design sessions 1 and 2 were led with the assistance from a paid experienced facilitator. In each case, the facilitator led the co-design sessions using a facilitator's handbook which detailed aims of each co-design session and tasks to be completed to meet each aim. Each session was commenced with an ice breaker and after this, participants would be guided by the facilitator in completing the session tasks which are detailed in the sections below individually by session. During each session the researcher or research supervisor observed the process and took field notes, this process was consented to by all participants Following Session 2, it was apparent that the external facilitator lacked context specific knowledge regarding the project and so this procedure was ceased at Co-design Session 3 and 4. In these sessions, the researcher facilitated the groups for Session 3 and Session 4, and the supervisor took field notes.

The co-design sessions took place in two separate MH service facilities in SECH region based on availability through the recovery college. Participants were issued with a Participant Information Leaflet before their first session commenced. The day and time of sessions was determined at the end of each prior session by means of group discussion and consensus voting. Participants were invited to fill out an anonymised questionnaire to gather data on group demographics (Appendix 19). Participants were verbally reminded of the procedures for co-design session before each session. In addition, all participants provided informed consent (Appendix 18). All co-design meetings were audio recorded (Dictaphone, Tascam DR-40), to allow for later content analysis.

3.8.3.2 Co-design Session 1

As per traditional EBCD approaches, the first Co-design session centred on “getting started”. In this endeavour, Session one marked the formation point of the o-design group and as such, Session 1 had the aim to form a co-design group and support increase knowledge on the basic concepts of PA, SB and exercise. In delivering on this aim, Session 1 had the following objectives:

- For participants to meet.
- For participants to learn about the basic concepts of PA and the benefit for people with mental illness.

- For participants to develop a clear understanding of the safety issues that relate to physical activity for people that have a mental illness.
- For participants to develop a clear understanding of the NPAG.
- For participants to conduct a group discussion on how the above factors might relate to services to which they are attached.

An external facilitator was recruited and led Session 1. The lead researcher recorded the process and maintained field notes. A facilitator's handbook was developed to help guide the session and keep activities structured to a predetermined time. In Session 1, participants were guided through an ice breaker task, a ground rules formation task, and a brief experiential learning task on PA and SB (about the PA guidelines and safety). The session was closed with an experience-based discussion. This session was delivered in a circular group setting where the facilitator could make eye contact with all participants. Participants were encouraged to mix and not sit with people they knew prior, thus encouraging service users and service providers to intermix.

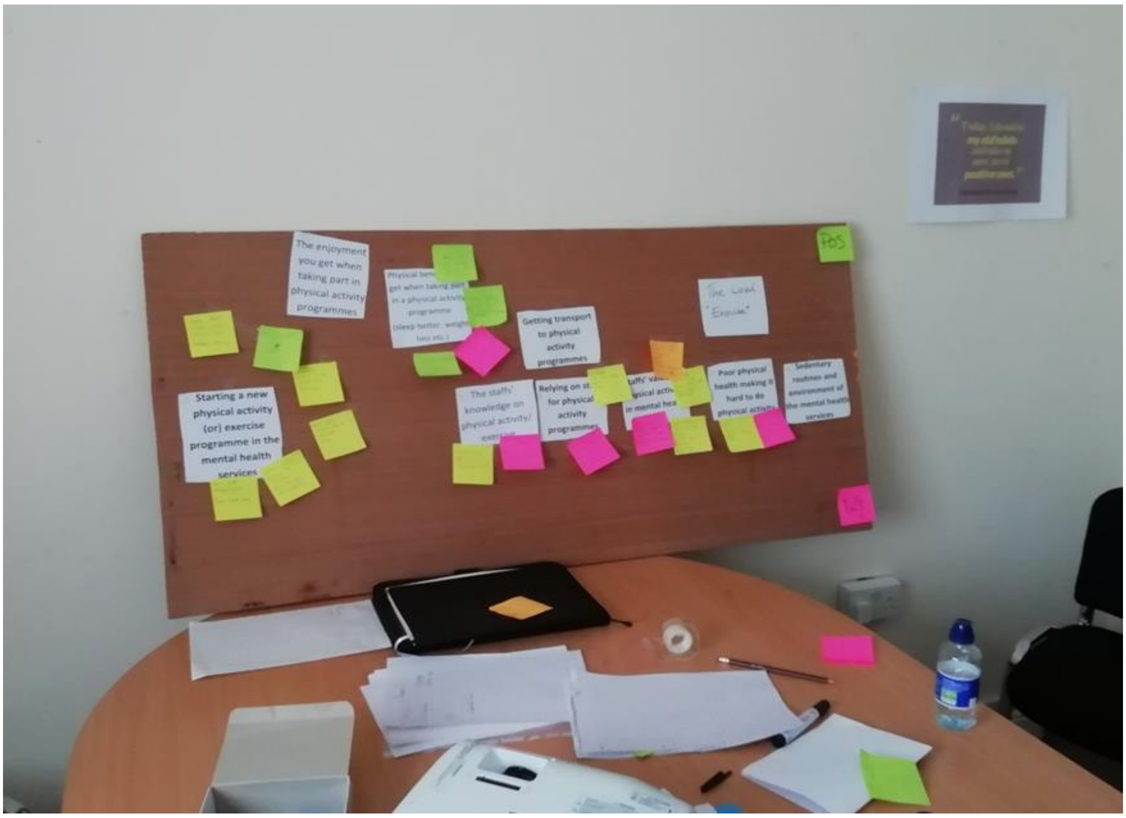
3.8.3.3 Co-design Session 2

One week after Session 1, Co-design Session 2 was carried out. The aim of Session 2 was to make service user and service provider experiences of PA available to the Co-design group, as per the outcomes from Study 1 and Study 2 of this project. Session 2 had the following objectives:

- Carry out trigger film (with 'touchpoints') viewing
- Carry out poster viewing (service provider touchpoints) viewing
- Carry out separate service user and service provider priorities mapping
- Carry out a joint sharing of priority mapping

In Session 2, the group convened and were invited to watch the master trigger film showing ‘touchpoints’ and key theme moments that were developed on the back of Study 2. Following this, a brief group discussion was facilitated, encouraging participants to explore their own experience and emotions with regard to the content as per traditional EBCD. This discussion was audio recorded and field notes were made to assist with later analysis and to prompt discussion later in the session. The group was then divided in two, forming a subgroup for service providers and a sub-group for service user/carers. Similar processes are advocated for in EBCD research, as it allows for free discussion and opinion sharing that may not be forthcoming with oversight from one’s clinician in the room (Bate and Robert, 2006). These groups were then individually facilitated by the researcher and external facilitator respectively to carry out a prioritising exercise in relation to the touchpoints raised during the film, and additionally, to contribute new touchpoints of their own to integrate into the priority list. Following this task, the group were then unified together and facilitated in a storyboards exercise (Bate and Robert, 2007 pg 101), to carry out a joint priorities task much the same as what was done in the smaller group. Participants were encouraged to interact with the story board using specific colour sticky notes to denote certain emotions attached to priority areas and touchpoints. These sticky notes were colour coded to denote a positive and negative experience. Participants were then facilitated in a final discussion on the joint priorities task, amending the storyboard accordingly. Again, the discussion and processes in this work were audio recorded to collect data. In addition, the researcher took photographs of the story board process as a means of data collection from which information could be synthesised and brought forward into subsequent Co-design sessions. See the visual image of storyboard exercise located below the text in Figure 3-3.

Figure 3-3. Story board visual from joint priorities task



3.8.3.4 Co-design session 3

The group was reconvened for Session 3 two weeks after Session 2 (as per agreed session scheduling by the group). Session 3 had the following aim: To generate an initial prototype of the MWRP. To meet this aim, the objective of Session 3 was to carry out facilitated co-design prototype work using the TIDieR framework as a guide to shape the MWRP component parts. While the group had formed and worked collaboratively, the nature of the collaboration until this point had not necessarily leant itself to conflict. During Session 3 and 4, participants were working towards a common goal. As such, conflict could have arisen, and participants may have needed to compromise. The researcher was cognisant of, and explicitly worked to maintain equal power relations between service users and service provider participants to ensure that all perspectives were considered to avoid conflict and build group cohesion (Pettigrew & Tropp, 2006). In doing this the researcher, used small group working and asked direct questions towards individuals.

Participants were divided into two groups, maintaining where possible, a mix of service user and service provider participants. Groups were provided with pens, paper and materials needed to complete tasks. Groups were provided with worksheets showing spaces in relation to programme component areas for the *Move with Recovery Programme.* The participants were then invited to work in their small groups to bring solutions to each of the component areas that were broadly defined using guidelines from the TIDieR guide for better reporting of interventions. The TIDieR framework was devised using a literature review process and a survey of international epidemiological experts in the field. The TIDieR is designed to support the development and replication of intervention research. The TIDieR provides a 12-item checklist across intervention component parts which is used to improve the quality of intervention reporting (e.g. name of the programme, why/rationale for the programme, what materials are needed for programme or training, what procedures/processes/activities are involved, who is involved/expertise and relevance, description of mode of delivery, type of location/necessary infrastructure, necessary tailoring/adaptations, number of contacts/times/sessions/dose, modifications required or facilitated, fidelity of programme/intervention, issues with adherence) (Hoffmann et al., 2014). This provided a blank canvas framework from which necessary programme information was discussed and inputted (Hoffmann et al., 2014). In addition, the wider research project approach was framed by the SEM (Sallis et al. 2006). In bringing this framework forward into co-design work, participants in this session were encouraged to consider factors from across the many levels of the SEM, which may influence the success and feasibility of the MWRP during this prototype work.

In doing this, the researcher supported the small groups to understand some of the component areas of the TIDieR guide. The researcher allocated time to deal with each area, in addition to giving participants a break period during the process. Participants were guided to work purposefully to generate action points to address gaps in the TIDieR framework. The groups would then return to a larger group setting to discuss similarities and differences between their action points and efforts were made by the researcher to consolidate the work of both groups to reach a ‘consensus action point’. A brief synopsis of the initial priority issues that arose that arose during Session 3 and the consensus action points to each are shown in Table 6-2 and Table 6-3 respectively, located in Chapter 6. The action points developed in this Session provided initial information for the researcher to format the information into a prototype MWRP resource. This draft resource was produced in hard copy format for participants to carry out detailed prototype refinement working in Session 4.

3.8.3.5 Co-design Session 4

In Co-design Session 4 the group reconvened two weeks after Session 3, again as determined by group consensus. Session 4 had the aim to: To generate a master prototype of the MWRP. To meet this aim, Session 4 had the objective to carry out facilitated small group co-design prototype work followed by large group prototype consensus work using the TIDieR framework as a guide to shape the remaining components of the MWRP.

In this session the groups were provided with a number of hard copy MWRP prototypes developed on the back of Session 3. In addition to this, pens, sticky notes, and other materials were provided by the researcher. Both groups were guided through each section of the prototype documents by the researcher facilitating the groups together. In this instance, time was allocated to each section of the proposed prototype providing structure to the Session 4. Both groups were allowed time to work purposefully on each section, documenting any amended Action points on the hard copy prototypes using stationary provided. Both groups were made up of service user and service provider stakeholders to support a balance of opinion and insight. Following completion of this, the two groups were again brought back together to the larger group setting to discuss similarities and differences between their Action points, strategies within Action points and efforts were made by the researcher to consolidate the work of both groups to reach a 'Consensus Action point'. For instance, where both groups had different perspectives in relation to an Action point, this was discussed among the wider group through facilitated discussion where all participants were allowed time to voice their opinion. Where no resolution was achieved, a ballot was used to resolve a matter. A brief synopsis of the initial priority issues that arose that arose during Session 4, and the consensus Action points to each are shown in the Results, see Chapter 6 (Table 6-2 and 6-3).

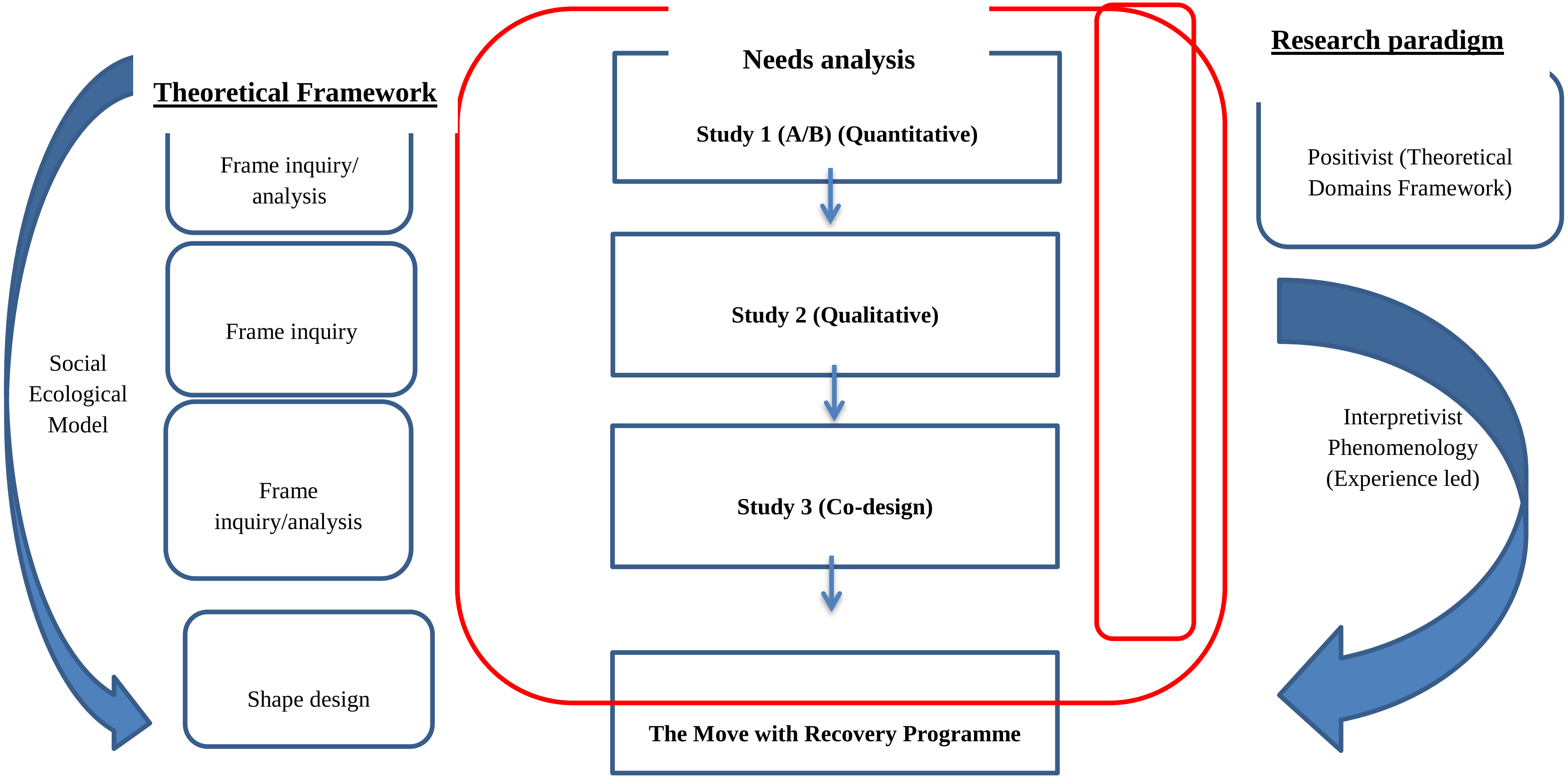
3.9 Ethical considerations

The process of obtaining ethics brought about the modification of the EBCD process and approach taken. First, qualitative interviews with service users and service providers were carried out in a different geographical location to where co-design work was subsequently carried out were not subject to filming as per the traditional EBCD approach in order to protect the anonymity of participants. To minimise the effect of this omission, all qualitative interviews were subject to audio recording and subsequent transcription where consent had been obtained.

All participants from qualitative interviews (Study 2) were required to provide informed consent prior to commencing of data collection (Study 2). Within the consent documents, participants could opt to have their de-identified interview recreated by a professional actor for inclusion in the trigger film. Participants could also opt for their data to be excluded from Study 3 but continue to be used in Study 2. All transcripts and field notes from Study 2 that were provided to the professional actor to create the actor portrayal of interviews were de-identified. In addition, participants that attended the co-design process were provided with refreshments at each session.

All hard copy files including field notes were stored in locked filing units in the Department of Nursing in WIT. All hard copy transcripts of interviews (Study 2) were anonymised prior to distribution to the professional actor. All audio files were anonymised and stored on a WIT password protected computer.

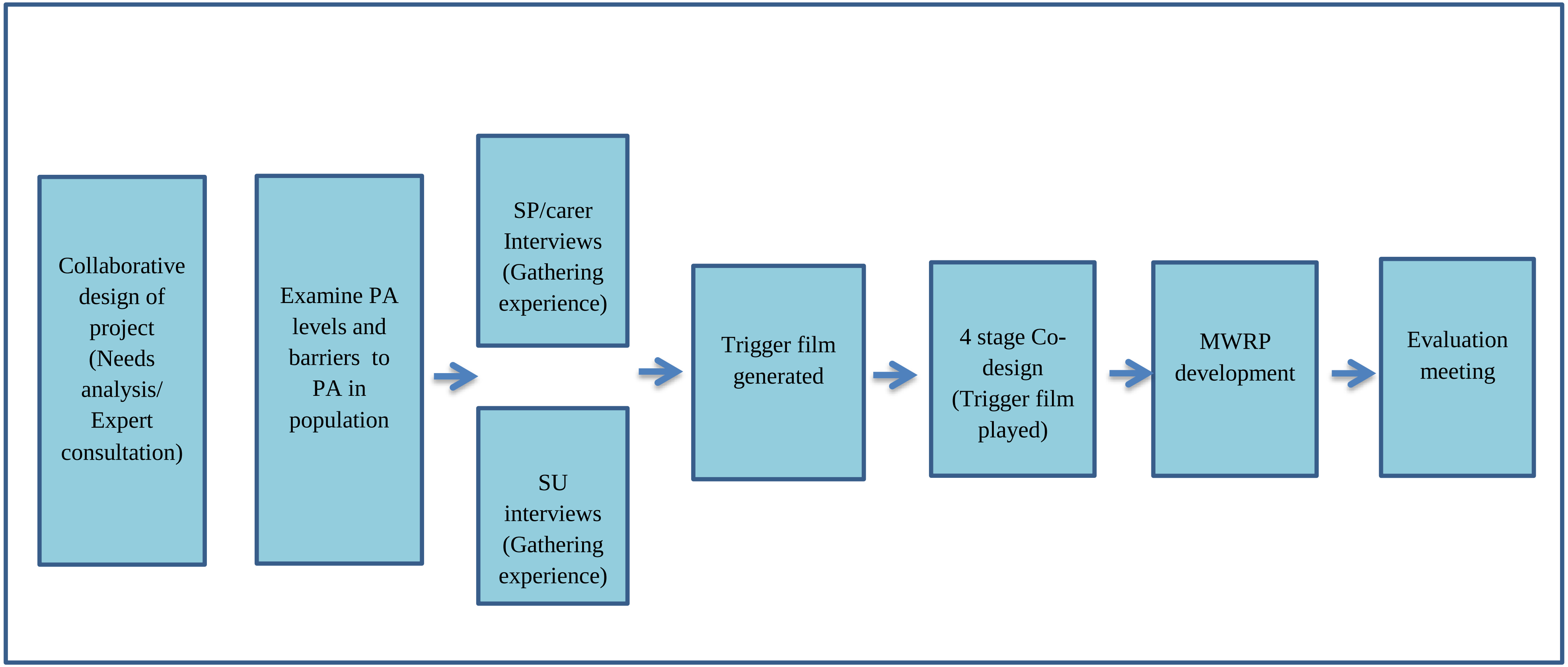
Figure 3-4. Overview of research approach and theoretical framework



3.10 Conclusion

This chapter provides a detailed overview of the modified EBCD approach that this research project has taken. The overviewed project shows a comprehensive modified EBCD approach including a diversity of quantitative and qualitative research methods incorporated to provide context of the PA and SB of the population, identify factors that influence PA and SB for the specific population among an extensive *Gathering experiences* component of the research and lastly the final co-design component of the EBCD approach used to develop the MWRP. This chapter has given a detailed description of the process involved with achieving the above, giving the reader understanding of the methodological underpinnings and the steps taken for the methods of these linked studies 1, 2 and 3. The diagram shown below, Figure 3.5 presents the key aspects of the overall modified EBCD process and its interconnectedness between components of the research studies within the overall EBCD process.

Figure 3-5. Flow chart of modified EBCD process in current research



Chapter 4

Examining physical activity and sedentary behaviours in outpatient rehabilitation mental health care

Chapter 4: Examining physical activity and sedentary behaviours in outpatient rehabilitation mental health care

Study 1

4.0 Introduction

This Section 1 of Chapter 4 provides a brief synopsis of the literature included in the earlier critical review (Chapter 2), which supports Study 1 (A) and Study 1 (B), which together make up Study 1 of the research project.

The critical review carried out in Chapter 2 of this thesis demonstrates the evidence which shows that PA and SB are a valuable therapeutic resource for clinical recovery in MH treatment for people with SMI. People with SMI are at increased risk of poor physical health and consequent early mortality for which lifestyle related behaviours are key modifiable risk factors (Correll et al., 2017; De Hert et al., 2011; Thornicroft, 2011; Vancampfort, Stubbs, et al., 2015). Separately, the concept of prolonged SB (<1.5 METs/ reclining or sitting state) is thought to also independently contribute to poorer cardiometabolic health (Biswas et al., 2015). There are two predominant means of measuring PA and SB within PA epidemiology research. These are SRQs and OBM. Self-report questionnaires are useful for maximising sample size within limited resources but are subject to recall bias. On the other hand, OBM, which are predominantly accelerometers in PA epidemiology, remove the inherent bias of participant recall but are burdensome for participants, expensive relative to SRQs, and may not readily measure PA within certain domains (Bauman, Phongsavan, Schoeppe, & Owen, 2006; Dishman et al., 2001; Lee & Shiroma, 2014).

Despite these benefits, transdiagnostic meta-research shows that 55% of people with SMI do not meet NPAG. In addition this study found people with SMI spend on average, 476 mins/day sedentary, which is comparatively worse than matched controls with respect to both SB and adherence to NPAG (Vancampfort, Firth, et al., 2017). Despite these findings, there is considerable variability with regard to PA and SB between individual studies. For instance, 65% of inpatients (n=101) from an Australian sample that wore ActiGraph GT3x devices met the NPAG (Fraser et al., 2015). Other Australian research using SRQs has shown 70% of outpatients with SMI are not meeting PA guidelines of >150 mins MVPA/week (Chapman et al., 2016). Yet, OBM research on people specifically with diagnoses of BPD shows high levels of SB and no participants achieving NPAG in another study (Janney et al., 2014).

The findings shown above are telling of the importance of future research measuring PA, and also SB where possible, as there are clear differences between subgroups. While PA measurement tools appear to play a role in influencing PA levels recorded in the research, there are also a number of biopsychosocial factors which exert influence on PA behaviours of this population that have been discussed in detail in Chapter 2. As an example, successful increases in PA are found in Australian research where PA is part of integrated care that is led from well-developed policy (Lederman et al., 2016). Additionally, social support may serve as a valuable facilitator of PA during SMI (Gross et al., 2015). Community PA programmes have identified reduced social opportunities as an intervention limitation (Beebe et al., 2005). Interestingly, inpatient treatment by its nature, offers more opportunity for social influence during PA (Fraser et al., 2015). While such integrated approaches to PA seen in Australia are clearly effective, there are contexts such as Ireland where such integrated approaches are not feasible. In addition, such approaches locate and focus PA into the MH facility setting by definition. Such is arguably removed from recovery focused service delivery which emphasises community focused and also focused on the barriers to PA that exist for service users in a service where there is no integrated PA system in place.

The investigation of influences on PA seems necessary in the context of developing future PA and SB programmes that can be implemented easily within a real world clinical setting.

In addition to low levels of PA, people with SMI also seem to spend large amounts of time in SB (Kruisdijk et al., 2017). There appear considerable differences between matched controls SMI populations in relation to PA and SB (Stubbs, Williams, Gaughran, et al., 2016; Vancampfort, Firth, et al., 2017). Much like PA, the apparent low levels of PA and high rates of SB are likely effected by a range of barriers to PA that people with SMI experience (Soundy, Stubbs, et al., 2014; Firth et al., 2016). Physical activity barriers for this population are nuanced and often specific to mental illness itself, and yet, their identification does not directly speak to the identification of barriers that may influence behaviour change. What is more, there are deficiencies in knowledge regarding how these barriers differ between people with SMI that are active and those that are not, which may provide insight into the barriers to PA that influence PA and inactivity. At present there is little or no literature from within an Irish context in relation to PA or SB or indeed, the factors of influence on these behaviours in this context.

Within Study 1, there are two studies with separate samples that are described in detail in Chapter 3. These are Study (A), which is described first. Study (B) is then subsequently presented. Both studies make up the wider Study 1 and will be discussed together in a Chapter Summary

Study 1 A

4.1 Background to Study 1A

In Chapter 2, the inherent challenges that exist with PA measurement tools and their use in SMI populations, which have also been outlined in a narrative review (Soundy, Roskell, et al., 2014) are discussed. One measure of PA that appears to be consistently reported across intervention research as a threshold point at which effects of clinical recovery are most potent, are the PA guidelines of 150 minutes of MVPA/week. Indeed, the clinical significance of the NPAG appear clear within the literature which is evident from their recent inclusion in EPA guidelines (Stubbs et al., 2018).

While efforts have been made within the literature to consider CRF and energy expenditure as outcome measures within PA research for people with SMI (Sharpe, Stedman, Byrne, Wishart, & Hills, 2006; Vancampfort, Hagemann, et al., 2017), the clinical significance of the NPAG has been put forward in recent EPA guidelines as a threshold target for people with SMI to strive for (Stubbs et al., 2018). Cross-sectional research shows people with SZ have lower cardiometabolic risk factors where NPAG are met compared to those that are inactive (Vancampfort, Stubbs, Probst, *et al.*, 2016). Randomised controlled trial research also indicates a causal capacity of PA intervention in excess of NPAG to ameliorate cardiometabolic risk factors for disproportionately occurring rates of physical comorbidity within SMI populations (Daumit et al., 2013; Firth et al., 2017; Rosenbaum et al., 2014). Above all, the NPAG offer a threshold level at which benefits in relation to clinical recovery and symptoms reduction may be felt for people with SMI (Stubbs et al., 2018). Therefore, NPAG appear a suitable target outcome measure on which PA should be measured against and promoted upon.

Within PA epidemiology, brief item SRQs comprising of one, two or three questions have been developed with a view to maximising participant engagement by minimising participant burden, allowing for mass population level measurement (Milton et al., 2011). Reducing participant burden is in this context valuable, where engagement with PA interventions and research is likely to be poor (Brand et al., 2016). While some research questions the accuracy of brief item SRQs in healthy populations (Murphy et al., 2017). Such evidence is limited to highly active population groups, and is therefore not readily transferable to this sedentary population (Murphy et al., 2017; Zwolinsky et al., 2015). The 3Q (Three Item Questionnaire) was developed for use in clinical populations, rather than athletic populations and has shown to be reliable and valid against the Global Physical Activity Questionnaire using in a general population sample (Milton et al., 2011). Therefore, the brief item measures, such as the 3Q assessment may be cautiously presented as an easy to use SRQ tool for examining PA against guidelines. The PA guidelines have been identified by the EPA as desirable to measure for the health of people with SMI. Similarly, while there have been considerable calls within the literature for greater use of OBM such as accelerometery, there are limitations to this. For instance, OBM do not have the capacity to measure across certain PA domains (Smith et al., 2005; Troiano et al., 2008). This finding suggests that the use of a brief item SRQ in concordance with OBM would be beneficial in SMI populations going forward.

Lastly, looking to the Irish context lastly, there is a deficiency in quantitative research examining broad barriers and facilitators to PA, and none from an Irish context. What is more, at present, the relative dominance of psychological based theories in the literature has left only a scant body of evidence that have comprehensively examined barriers across a range of PA influencing levels, such as in the SEM. Of these, there are no Irish studies of this nature, and so quantitative research to examine the factors that influence PA is important for providing the foundation knowledge on which the *Move with Recovery Programme* (MWRP) can be designed. In addition, rehabilitation and recovery MH service users in Ireland make up a specific vulnerable cohort with diverse needs (Lavelle et al., 2007), and likely have high rates of comorbidity (Behan et al., 2008; Nash et al., 2015). There is a need for Irish research that has examined these factors of influence that may be specific to the particular population of interest.

In Section 2 of Chapter 2, the qualitative research that has explored the barriers and facilitators to PA in people with SMI are shown. In addition to this, the quantitative literature that has investigated the factors that influence PA for people with a SMI in relation to barriers to PA are also examined (Firth et al., 2016; Glowacki et al., 2017). People with SMI, experience a plethora of barriers to PA that occur in bio-psychosocial and physical environment domains of behaviour change (Glowacki et al., 2017). For example, sixty one percent of people with SMI identify negative affect and stress as barriers to their PA (Firth *et al.*, 2016). Yet, as much as 70% of people with SMI also largely believe that health benefits are attainable in being physically active (Sylvia et al., 2009; Ussher et al., 2007). In examining the PA levels of people with SMI in Ireland, it seems pertinent to utilise both quantitative and qualitative methods to investigate the factors that influence PA for people with SMI as both appear to complement each other with respect to addressing their individual limitations. Therefore, this Study 1 (A) will be supplemented further by Study 2 in Chapter 5, thus providing a comprehensive understanding of the influences flagged in this study.

Understanding the prevalence of barriers to PA in the literature and understanding the factors that are correlated with high and low levels of PA for this population are useful points from which behaviour may be explained and better understood (Vancampfort, Knapen, et al., 2012; Vancampfort, Stubbs, et al., 2015). In doing so, consideration for important factors that influence PA behaviour can be integrated into behaviour change programmes. In this regard, salient findings from this study will be taken forward to co-design work in Study 3 (Chapter 6) to help guide the development of the MWRP.

Previously, The Theoretical Domains Framework (TDF) has been utilised successfully to examine barriers and facilitators of PA in people with depression across psychosocial domains of behaviour change (Glowacki et al., 2017). The TDF demonstrates factors that influence PA across the spectrum of levels within the SEM (Sallis et al., 2008). The DPAQ can be utilised to examine the difference in barriers between active and inactive persons to determine where stronger barriers to PA exist across 11 psychosocial domains of PA behaviour change from the TDF (Taylor, Lawton, & Conner, 2013). The application of the DPAQ, and by consequence, the TDF within an SMI population was first carried out by the current author(s) (Matthews, Cowman, Brannigan, et al., 2018). It has since been used also in persons with depression (Glowacki et al., 2017) and has been shown to be a suitable resource to carry out examination of key physical activity influences for MH populations.

4.2 Aims and objectives

The aim of Study 1 (A) is to measure PA levels and the strength of biopsychosocial and physical environmental barriers to PA among outpatients with SMI in rehabilitation and recovery MH services.

The study objectives are: (i) to measure PA levels of rehabilitation and recovery outpatients with SMI using self-report questionnaire measurement (3Q). (ii) To examine the strength of barriers to PA for rehabilitation and recovery outpatients with SMI across key psychosocial domains of behaviour change using the DPAQ.

4.3 Methods: Study 1A

The overall research methodology for this Study 1(A) which focuses on the procedural steps and ethical measures are presented in Chapter 3. This section provides a brief outline of the methods taken to provide context for the reader.

4.3.1 Research design

A cross-sectional, multi-site design was adopted and STROBE guidelines were followed in reporting to maintain rigor of methods (Vandenbroucke et al., 2007). Voluntary response sampling was undertaken in rehabilitation and recovery MH facilities in Ireland (N=14).

4.3.1.1 Theoretical Framework

As outlined in Section 3.1.1, this research study utilised the Theoretical Domains Framework (TDF) (Cane et al., 2012) which is reflects constructs of the SEM (Sallis et al., 2006).

4.3.2 Participants and recruitment

Eligible participants were aged between 18-70 years old in receipt of care from the rehabilitation and recovery services (HSE) in the South-East of Ireland. Eligible participants were attending MH services for a diagnosed mental illness (ICD-10). Participants were eligible if not in an acute state of crisis at the time of interview and willing to participate in the interview process.

4.3.3 Procedures

Following institute and health service ethical approval for this research, an advertisement poster was initially used to recruit participants. In total n=14 separate rehabilitation and recovery MH facilities were accessed for this study during the period of data collection (shown below). Information sessions and a study advertisement were carried out at each relevant MH facility. Blank surveys were left at sites with a locked deposit box for service users to self–complete or complete the survey with the assistance of MH service providers. All eligible participants were also offered assistance in completing the anonymised questionnaire from the researcher. Participants that were offered the opportunity to participate verbally during information sessions were also reminded that participation was voluntary. Data collection took place from March – July 2016. A minority of participants self-administered the survey (5%). The majority were assisted to complete the questionnaire (95%).

4.3.4 Data collection tools

Demographic data was collected by a series of questions about gender, nationality, relationship status, mental health diagnosis, physical comorbidity, medications and type of residence (high, medium or low dependency facility) which served as proxy indicator of illness severity.

3.3.4.1 Physical activity measurement

The *3Q physical activity assessment* was adopted in this study on account of minimal associated participant burden (Marshall, Smith, Bauman, & Kaur, 2005). The 3Q allows for the calculation of scores to screen participants against PA guidelines (Smith et al., 2005). To the knowledge of the researcher, the 3Q PA assessment has not undergone validation in a SMI population previously. However in general populations, this SRQ shows moderate test-retest reliability, moderate concurrent validity and fair criterion validity (Smith et al., 2005).

4.3.4.2 The barriers to physical activity

The Determinants of Physical Activity Questionnaire (DPAQ) was used in this research study. The DPAQ domains represent key theoretically informed domains of PA behaviour change (Michie, Johnston, Francis, Hardeman, & Eccles, 2008; Taylor et al., 2013). The DPAQ allows for examination of the strength of barriers to PA in key psychosocial domains that represent theoretical constructs of behaviour change. A full version of the DPAQ is shown in Appendix 8.

4.3.5 Data analysis

Data were analysed using IBM SPSS 22. The standard deviation for the DPAQ tool was 1.2 (Taylor et al., 2013). An *a* priori power calculation based on the study by Taylor and colleagues was conducted using G*-power 3.1 statistical software. Sample size for analysis of variance with a significance level of 5% and power of 0.80 was calculated as 96. All DPAQ questions, including questions where reverse scoring had been implemented, were subject to Little's Missing Completely at Random Test (MCAR test). The results showed Chi –square 568.341 (p=.327) indicating that data are missing at random. As a result, and following consultation with the scale developers, expectation maximisation was used to impute missing values. A Kolmogorov-Smirnov test indicated that data were not normally distributed and non-parametric tests were utilised during analyses. Accepting Cronbach's Alpha score to be α=.7 (Pallant, 2013), acceptable internal consistency was shown for the DPAQ in this current study, where the Cronbach's Alpha score was α=.774. Due to violations of the normality assumptions within data for some variables as outlined above, K independent samples tests (Kruskal-Wallis H test) were used during bivariate analysis between groups. This was done for all DPAQ related analysis.

4.3.6 Ethical approval

Study 1 was approved by the HSE South-East Research Ethics Committee and The Research Ethics Committee of Waterford Institute of Technology. Details of the ethical considerations taken in account are detailed in Chapter 3 (3.5.4).

4.4 Results

4.4.1 Social and clinical demographics

The sample was made up of outpatient MH service users (rehabilitation and recovery) with diagnosed SMI (n =105) from five counties in Ireland (SECH). Participants had a mean age of 52 (*Std.* =11.1). The majority of participants were male (71%). No difference (*p*=.405) were shown between males and females in relation to age. The majority of participants reported their relationship status as 'single' (84%), additionally 6% and 5%

reported being “married living and with their partner” and being ‘separated or divorced’ respectively. Table 4.1 below shows a breakdown of county locations where service user participants resided and data were gathered.

Table 4-1 Demographic information by geographical location

Location	Male *n (%)*	Female *n (%)*	Total *n (%)*	Mean age *(Std.)*
County of residence				
Waterford	23 (31)	5 (17)	28 (27)	52.82 (10.02)
Wexford	11 (15)	3 (10)	14 (13)	41.86 (9.8)
South Tipperary	18 (24)	11 (37)	29 (28)	50.10 (11.6)
Carlow	10 (13)	3 (10)	13 (12)	54.08 (10.08)
Kilkenny	13 (17)	8 (27)	21 (20)	57.80 (8.4)
Total	75 (71)	30 (29)	105 (100)	51.68 (11.06)

Two participants did not disclose their age

The majority (49.5%) of participants resided in ‘low support residential accommodation’: either living alone or shared with other persons accessing MH services; in the community; living alone or living in a wider family home. The remaining participants that responded were living in high or medium support MH facilities (37.1%), where 24 to 12-hour nursing care is provided to meet the needs of service users. A breakdown of this accommodation dispersal by sex is shown below in Table 4-2

The mean age for high and medium level residential facility dwelling participants was 52.76 years and the mean age for those in low level/community dwelling participants’ was 52.79. In the absence of data on number of hospitalisations or duration of psychiatric illness, this is hoped to provide a proxy indicator of illness severity.

Table 4-2 Social demographics

	Male *n (%)*	**Female** *n (%)*	**Total** *n (%)*
Type of accommodation			
High and Medium level support CMRF/hostel	30 (77)	9 (23)	39 (43)
Low level support CMRF/dwelling	32 (62)	20 (39)	52 (57)
Total	62 (68)	29 (32)	91 (100)
Diagnosis			
SZ/psychotic disorders	36 (90)	4 (10)	40
Affective disorders only	15 (43)	20 (57)	35
Co-occurring schizoaffective disorders	13 (100)	0 (0)	13
Other primary diagnosis	2 (67)	1 (33)	3
Total	66 (73)	25 (28)	91 (100)
CMRF = Community Residential Facility			

With regard to diagnosis, dual diagnosis did occur, but where possible primary diagnosis was reported. Fourteen participants did not disclose a diagnosis. The analysis of results on self-reported health found 48% of respondents had one or more physical comorbidities and 50% reported having none. In relation to types of comorbidity, 14% reported a cardiovascular illness, 17% reported diabetes mellitus and 11% reported a pulmonary related illness.

4.4.2 Physical activity behaviour

The findings show 72% of participants did meet PA guidelines for health. The majority of participants (60%) reported no moderate intensity PA sessions in a typical week. In relation to vigorous intensity PA, 94% reported no sessions in a typical week. However, over 50% reported regular walking on a typical week. Participants PA behaviours of a typical week are surmised below in Table 4-3.

Table 4-3. Participants engaging in sessions of walking, moderate and vigorous PA/week

Sessions of physical activity	**None** *n* (%)	**1-2 times/week** *n* (%)	**3-4 times/week** *n* (%)	**≥5 times/week** *n* (%)
Walking	23 (23)	27 (27)	39 (38)	13 (13)
Moderate intensity activity	62 (61)	31 (31)	6 (6)	3 (3)
Vigorous	96 (94)	4 (3.9)	2 (2)	-

Bivariate analysis on PA behaviours was carried out. In relation to differences between persons that were sufficiently active compared to those that were not in meeting PA guidelines, no statistical difference were shown between sex, age category, housing status, marital status, psychiatric diagnoses, self–reported mental health status, number of antipsychotic medications, number of comorbidities, and self-report physical health status.

No significant differences were seen between males and females in relation to their meeting the PA guidelines, and number of sessions of walking, moderate and vigorous PA undertaken per week. Despite no difference in PA guidelines across age categories, strong significant differences between age categories in relation to the number of sessions of moderate PA/week (p=0.008) and vigorous PA/week (p=0.00) were observed, indicating less PA among older participants. Table 4-4 below displays the findings of PA levels between differing social, biological demographic categories of participants.

Table 4-4. Demographics and the physical activity guidelines

	Meeting PA guidelines *% of total (n)*	**Not meeting PA guidelines** *% of total (n)*	***P* value^1**
Total available sample			
n=104	28 (29)	71 (75)	
Sex			
Male	22 (23)	50 (52)	0.311
Female	6 (6)	22 (23)	
Age			0.202
18-34	4 (4)	4 (4)	
35-54	16 (16)	34 (35)	
≥55	9(9)	33 (34)	
Housing status			
CRF	27 (28)	46 (41)	0.421
Independent housing	1 (1)	33 (30)	
Marital status			0.530
Single	27 (28)	67 (70)	
In relationship	1 (1)	5 (5)	
Psychiatric illness			
Schizophrenia, psychotic type	10 (9)	34 (31)	
Schizoaffective types (co-occurring)	7 (6)	8 (7)	
Affective disorders (MDD, BPD)	12 (11)	26 (24)	

Other primary diagnosis	2 (2)	1 (1)	0.212
SR mental health			
Poor	1 (1)	9 (9)	0.528
Fair	8 (8)	18 (19)	
Good	8 (8)	22 (23)	
Very good	5 (5)	14 (14)	
Excellent	10 (10)	7 (7)	
Antipsychotic medication			0.384
None	8 (6)	21 (15)	
1 reported	19 (14)	24 (17)	
≥2 reported	8 (6)	19 (14)	
Physical comorbidity			0.720
None	16 (16)	35 (36)	
1 comorbidity	10 (10)	25 (25)	
≥2 comorbidities	12 (12)	12 (12)	
SR general health			
Poor	4 (4)	13 (13)	0.940
Fair	11 (11)	25 (26)	
Good	6 (6)	17 (18)	
Very good	3 (3)	9 (9)	
Excellent	5 (5)	9 (9)	

*P≤0.05, **P≤0.001*; CRF= Community Residential Facility; SR = Self-report*

4.4.3 The strength of barriers in domain areas

Correlation analysis using Spearman's rank-order correlation was carried out. The findings showed a moderate significant correlation between PA classification and the domain DPAQ score for '*Beliefs in consequences'*. In this case, stronger barriers are linked to lower levels of PA (r= .446, p= *.000*). No other DPAQ scores shared correlations with measures of PA.

Non-parametric Kruskal-Wallis test was used to measure differences between males and females in relation to strength of barriers to PA that occur across the 11 psychosocial domain areas of physical activity and a summary of results can be seen in Table 4-5. The analysis found that female participants had heightened barriers to PA in the determinant area 'Coping planning'. Data analysis also shows barriers to PA occurring in the determinant area of Emotion were greater for males compared to females.

Table 4-5. Barriers to physical activity in key psychosocial domains

Determinant area	**Male** *Mean (n, Std., SE)*	**Female** *Mean (n, Std., SE)*	***P* value**[1]
Capabilities	2.90 (68, 1.139, .138)	3.53 (26, 1.616, .317)	.114
Knowledge	4.17 (54, 1.165, .146)	4.05 (20, 1.146, .256)	.341
Skills	3.55 (59, .702, .091)	3.65 (20, .964, .216)	.681
Goal conflict	3.91 (56, .676, .090)	3.91 (19, .366, .084)	.732
Consequences	5.34 (62, 1.111, .141)	5.61 (23, .723, .151)	.465
Motivation and goals	4.30 (70, .546, .065)	4.27 (26, .550, .108)	.796
Coping planning	4.20 (55, .714, .096)	3.54 (20, .908, .203)	.003*
Environment	3.73 (66, .980, .121)	3.65 (25, .802, .160)	.833
Social influences	3.21 (62, 1.295, .164)	3.20 (24, 1.332, .272)	.831
Emotion	3.07 (65, 1.634, .203)	4.29 (23, 1.801, .376)	.004*
Action planning	4.09 (59, .995, .129)	4.46 (19, .987, .226)	.066

*P≤0.05, **P≤0.001; M = mean, Std. = standard deviation, SE = standard error ; *Lower mean score in DPAQ denotes higher perceived barrier*

Statistical analysis using the Mann-Whitney U test was carried out to investigate the differences in the strength of barriers to PA between participants that met PA guidelines and those that did not. Three statistically significant findings were found, as shown in Table 4-6 below. Participants that did not meet the PA guidelines were shown to only have significantly heightened barriers to PA in the determinant area of *'Beliefs about consequences'* and *'Motivation and goals'*. Participants that were shown to meet the PA guidelines had strong significant barriers to PA in relation to '*Social influences'* when compared against sub threshold participants, indicating that people that achieve higher PA levels find that lack of peer support to be a stronger barrier than those that do not engage in regular PA. This unexpected finding, in addition to the stronger barriers shown in less active participants in determinant areas of *'Beliefs about consequences'* and *'Motivation and goals',* will be examined further in the Discussion section of this study. The results of this analysis are shown in full in Table 4-6 overleaf. In addition to the results from the current research presented in Table 4-6, mean scores obtained from healthy population found in the initial DPAQ validation study by Taylor et al. (2013) are used here to contextualise the findings of the current research against DPAQ scores of a general population sample.

Table 4-6. Barriers to physical activity between active and inactive participants

Determinant area	**Meeting PA guidelines** *Mean (n, Std.)*	**Not Meeting PA guidelines** *Mean (n, Std.)*	***P* value**[1]	**Non-SMI population Taylor et al. (2013)** *Mean (Std.) n = 465*
Capabilities	2.91 (29, 1.39)	3.15 (65, 1.28)	.364	4.05 (1.59)
Knowledge	4.21 (27, 1.40)	4.11 (57, 1.03)	.744	4.54 (1.29)
Skills	3.44 (27, .680)	3.65 (52, .812)	.156	4.65 (1.26)
Goal conflict	3.84 (25, .840)	3.95 (50, .461)	.614	3.76 (1.16)
Consequences	5.93 (27, .734)	5.17 (58, 1.05)	.001**	6.06 (.67)
Motivation and goals	4.54 (29, .440)	4.18 (67, .552)	.001**	4.80 (1.17)
Coping planning	4.10 (24, .716)	3.98 (51, .866)	.521	3.32 (1.19)
Environment	3.92 (29, .98)	3.60 (62, .898)	.160	5.37 (1.14)
Social influences	2.77 (26, 1.34)	3.39 (60, 1.24)	.039*	4.15 (1.23)
Emotion	2.92 (27, 1.74)	3.60 (61, 1.74)	.088	4.94 (1.20)
Action planning	4.31 (25, 1.21)	4.11 (53, .89)	.836	4.57 (1.33)

*P≤0.05, **P≤0.001;M = mean, Std. = standard deviation, SE = standard error; *Lower mean score in DPAQ denotes higher perceived barrier*

Beyond the threshold of the PA guidelines, further analysis specifically on number of sessions per week of walking, moderate intensity PA, and vigorous intensity PA in isolation using a Mann-Whitney U test. Looking first to the number of sessions walking and number of sessions of moderate PA, participants were subdivided into two categories to denote high and low exercisers (≤2 sessions/week and >2 sessions/week). In relation to the number of walking sessions/week, significantly stronger barriers to PA for people that achieved none/low levels of walking sessions/week were observed in determinant areas '*Beliefs about the consequences'* to PA and '*Coping planning'* (*p*= 0.11 and 0.05 respectively). Significant barriers to PA were shown in the determinant area of '*Emotion*' among people with high levels of walking (*p*= 0.11). These results are shown together in Table 4-7.

Table 4-7. Differences in physical activity barriers between walkers and non-walkers

Determinant area	**Low** *(≤2 sessions week)* *Mean (n, Std.)*	**High** *(≥2 sessions/week)* *Mean (n, Std.)*	***P* value^1**
Consequences	5.12 (40, 1.105)	5.68 (45, .824)	.011*
Coping planning	3.84 (35, .926)	4.18 (40, .686)	.05*
Emotion	3.85 (43, 1.754)	2.94 (45, 1.653)	.011*

P≤0.05, **P≤0.001;M = mean, Std. = standard deviation, *Lower mean score in DPAQ denotes higher perceived barrier*

For persons that achieve none/low amounts of moderate intensity PA/week, significant barriers to PA were seen in the determinant areas '*Beliefs about the consequences'* and *'Motivation and goals'* (*p*=.005 and *p*=.014 respectively). People that achieved regular moderate intensity PA were shown to have heightened barriers to PA in the determinant areas of '*Skills*, '*Social influences'* and '*Emotion*'. (*p*= .046, *p*=.001, and *p*= .015 respectively). A visual summary of the determinant areas where barriers are shown to be significantly different between groups of 'high' and 'low' exercisers is presented below in Table 4-8.

Table 4-8. Barriers to physical activity in domain areas between high and low exercisers

Determinant area	**Low** ***(****≤2 sessions/week) Mean (n, Std.)*	**High** ***(****≥2 sessions/week) Mean (n, Std.)*	***P* value^1**
Skills	3.63 (69, .784)	3.20 (10, .571)	.046*
Consequences	5.31 (75, 1.014)	6.20 (10, .740)	.005*
Motivation and goals	4.25 (86, .541)	4.60 (10, .492)	.014*
Social influences	3.37 (76, 1.264)	1.97 (10, .808)	.001**
Emotion	3.55 (78, 1.748)	2.13 (10, 1.278)	.015*

P≤0.05, **P≤0.001;M = mean, Std. = standard deviation, *Lower mean score in DPAQ denotes higher perceived barrier*

The analysis of this current research examined the differences between people that reported no vigorous PA/week, 1-2 sessions/week, and ≥3 sessions/week in relation to strength of barriers to PA in the different determinant areas of PA. The results found that barriers to PA were significantly stronger for people achieving none versus those achieving vigorous PA 1-2 sessions/week in the determinant area of *‘Goal conflict’* (p=0.49).

In addition to the analysis already shown, analysis of the strength of barriers to PA between determinant areas was carried out using diagnostic groups as an independent variable. The findings showed significant differences between diagnostic groups in relation to ‘*Beliefs in the consequences’* (p= 0.24) where SZ type disorders were shown to have stronger barriers than other diagnostic participants. Significant differences were also shown in the determinant area ‘*Action planning’*, where participants with diagnoses categorised as ‘Other’ reported stronger barriers to PA compared to other diagnostic groups. The results of this analysis are shown in Table 4-9.

Table 4-9. Barriers to PA between psychiatric diagnosis groups

Determinant area	**Schizophrenia type** *Mean (Std.)*	**Affective disorders** *Mean (Std.)*	**Co-occurring schizoaffective** *Mean (Std.)*	**Other primary diagnosis** *Mean (Std.)*	***P* value**[1]
Capabilities	2.8 (1.03)	3.4 (1.5)	2.7 (1.2)	4.3 (1.5)	.113
Knowledge	4.3 (.88)	4.3 (1.2)	3.92 (1.2)	2.2 (1.2)	.054
Skills	3.7 (.56)	3.5 (.92)	3.5 (.88)	2.7 (.94)	.204
Goal conflict	3.9 (.57)	4 (.6)	3.7 (.76)	4.2 (.24)	.446
Consequences	5.0 (1.2)	5.8 (8.4)	5.7 (.61)	5.7 (.47)	.024*
Motivation and goals	4.4 (.47)	4.2 (6.5)	4.2 (.55)	4.8 (.19)	.193
Coping planning	4.1 (.79)	3.9 (.92)	4 (.91)	3.9 (1.05)	.853
Environment	3.8 (.97)	3.7 (.75)	3.3 (.88)	4.7 (2)	.307
Social influences	3.1 (1.34)	3.3 (1.3)	3.3 (1.48)	3.3 (1.9)	.937
Emotion	2.8 (1.4)	3.8 (2)	3.9 (1.8)	4.6 (1.1)	.074
Action planning	4.1 (1.0)	4.5 (.84)	4.1 (1.1)	2.6 (1.2)	.031*

*P≤0.05, **P≤0.001;M = mean, Std. = standard deviation, *Lower mean score in DPAQ denotes higher perceived barrier*

4.4.4 Summary of findings

The sample included people that have a diagnosed SMI (*n*=105). A mean age of 52 was shown across participants living in community or low support contexts (50%) or high/medium support contexts (37%) of rehabilitation and recovery mental health services, which in this instance was used as a proxy marker of illness severity. Schizophrenia and psychotic disorders (38%) were shown to be the most frequent diagnosis reported followed by affective disorders (33%). Almost half of participants had a physical comorbidity. Seventy two percent of the sample were not meeting PA guidelines (150 mins moderate PA/week), 60% and 94% reported no moderate PA or vigorous PA a week, respectively. Half of participants engaged in regular walking. No statistical difference was shown between major demographic and clinical variable subgroups between active and inactive (PA guidelines) participants. Participants that did not meet the PA guidelines and participants that achieved low levels of moderate PA per week experienced strong barriers to PA in the area '*Beliefs in the consequences*' (*p*=.001, 0.005) and '*Motivation and goals'* to PA (*p*=.001, 0.014) to PA. The findings in relation to *'Beliefs in the consequences'* of PA are arguably strengthened by the moderate but statistically significant correlation shown between strong barriers and low level of PA. Participants that achieved low levels of walking also had strong barriers in '*Beliefs about the consequences'* and '*Coping planning'* (*p*= .011, and *p*= 0.05). Interestingly, stronger barriers were seen in relation to '*Social influence'* (*p*=.039) among those meeting PA guidelines versus those that did not.

4.5 Discussion of Study 1A

The PA guidelines have been shown to serve as a measurable threshold at which cardiometabolic risk and negative symptoms of SMI appear ameliorated within PA trials/ intervention research (Firth et al., 2015; Vancampfort, Stubbs, et al., 2016). Based on SRQ findings, the current study found 72% of the sample of outpatients with SMI did not meet the PA guidelines for health. This finding presents a deleterious contrast to global meta-analyses showing just over half of people with SMI not meeting PA guidelines as measured by SRQ and OBM, and where the difference between the two across studies is not statistically significant (Vancampfort, Firth, et al., 2017). Nonetheless, the findings of the current research are consistent with other research with outpatient groups with SMI, which appear to be less active compared to inpatient comparisons. Similar findings to that of the current research are shown in a study from the USA with fifty five outpatients with a SMI, where under 40% met recommended guidelines based on RT3 accelerometer data (Jerome, Rohm Young, et al., 2009).

This reported research utilised a SEM to examine factors that influence PA for people with SMI. In doing so, the DPAQ, which is informed by the SEM, supported here by additional demographic questions, provides a comprehensive road map of inquiry into the bio-psychosocial factors that influence PA for this population and points to factors that may differ between this current research and international research examples. For instance, in considering the relative deleterious levels of PA observed among the sample of the current research, a number of the demographic factors measured should be noted. The evidence which has examined age as a correlate of PA among people with SMI shows that advanced age is not a consistent correlate of PA in people with SZ (Vancampfort, Knapen, et al., 2012). However, the opposite is found with regard to correlate research and people with BPD (Vancampfort, Correll, et al., 2013). Considering the unclear evidence with regard to age in this context, the mean age of the sample of this current research (52 years) may be a contributing factor to the poor levels of PA shown in the findings. Review research detailed in the earlier critical review of this research project (Chapter 2) paints an inconclusive picture with regard to how PA levels of people with SMI may be impacted by advancing age. That said, a number of transdiagnostic primary research studies indicate that age is an important influencing factor on PA levels in many respects. This finding should be explored further to make recommendations for the MWRP.

Research by Jerome *et al.* (2009) which accessed accelerometer data among outpatients, showed that older participants (>45 years) were significantly less active than younger counterpart with respect to min/week of MVPA; such significant differences were not observed in relation to PA guidelines (150 mins/week in bouts of ≥10 mins) in their research. These findings have been largely replicated in the current research presented here and speak to a difference in the pattern and type of PA adopted by older persons with SMI in outpatient settings. These finding suggest that older persons with SMI typically engage in less strenuous PA, opting instead for lighter intensity PA, such as walking. It seems likely that further OBM and qualitative research should investigate this assertion further. However, other research may also provide valuable insight regarding this difference in PA between older and younger people with SMI.

Other research which has shown that age may not necessarily alter total PA levels in SMI populations. Krogh *et al.* (2014) has shown older age is associated with better exercise intervention adherence among people with MDD. Similarly, earlier uni-axial accelerometery studies showed older persons with SZ may have comparable PA levels to healthy younger controls (Lindamer et al., 2008). In an effort to contextualise these findings, two studies using qualitative research methods from people with SZ, show that in some cases PA may be used by individuals as a reactionary precaution or intervention to manage physical health deteriorations that are perceived to be associated with advancing age (Leutwyler et al., 2014; Weissman et al., 2006). For instance, one study with a sample of sixteen older adults with SZ showed that structured PA may be used as a reactionary intervention by participants to manage worsening physical health issues allied to age (Leutwyler et al., 2014).

Research on inpatients has shown comparable findings to that of this current research and the research from Jerome *et al.* (2009). One study which accessed a sample of 184 inpatients with SMI from the Netherlands that utilised OBM (ActiGraph GT3x) showed younger age was moderately correlated with increased MVPA and reduced SB respectively (r= -0.51/r=0.38, p=<0.001) across the included sample (Kruisdijk et al., 2017). Taking a SEM perspective on these findings suggests that they should not be viewed as static, but instead as demographic factors that are likely to interact with other level factors to compound behavioural influence (Sallis et al., 2006). For example, research by Kruisdijk *et al.* (2017) and the current research leave room for multilevel influence between ecological model levels. It is possible that the environmental factors of the inpatient facility contribute to the increased sedentariness among those with advancing age in the study by Kruisdijk *et al.* (2017). It is also possible that service providers may alter the type and intensity of social encouragement provided to older participants that are sedentary. In demonstrating these numerous and potential confounding factors, the breadth of the SEM influence is hinted upon. However, all studies discussed here, including the current and Kruisdijk *et al.* (2017) are cross-sectional and therefore do not provide sufficient evidence for causal inferences to be made. With this being the case, qualitative research may contribute to unpacking these between level relationships. Based on the current research findings, further research seems warranted to explore the experiences of PA as people with SMI age. Moreover, it also seems pertinent to investigate how MH service providers perceive and act in relation to supporting older people with SMI in engaging with PA and whether this is a relevant issue for consideration in a PA and SB programme such as the MWRP.

The current study found 94% of participants reported no bouts of vigorous physical activity that were ≥ 20 minutes a week, which is consistent with a reliance on walking among other research with outpatients (Daumit et al., 2005). Maintaining the SEM perspective with regard to understanding analysis, it is possible that the reduced level of MVPA is as a consequence to advancing age profiles of the sample.

There were no differences between psychiatric diagnoses, number of prescribed antipsychotic medications, and level of service dependency in relation to meeting or not meeting the PA guidelines. This was surprising as antipsychotic usage has been previously associated with not meeting PA guidelines in SMI populations (Vancampfort, Firth, et al., 2017). With cause and effect being indiscernible from the cross-sectional data collected, a number of context specific factors may have contributed to the deleterious PA levels. These include, PA policy vacuum in Irish MH service (Matthews, Cowman, & Denieffe, 2018), and or the profound complex needs of rehabilitation and recovery mental health patients in Ireland (Lavelle et al., 2007). Context specific exploratory work is necessary to understand these issues further.

4.5.1 The strength of barriers to physical activity

The TDF has previously been applied to review research in SMI populations to study barriers and facilitators of PA (Glowacki et al., 2017). This review identified the domain area of '*Emotion'* as a salient domain from which barriers to PA occur for people with SMI, a finding that aligns with the wider research field (Soundy et al., 2014; Firth et al., 2016). In this current research study, the work by Glowacki *et al.* (2017) has been built upon. The TDF was also applied to primary research for people with SMI, in order to examine the strength of barriers that occur in specific domains of behaviour change, so that future PA programmes can be tailored to specific domains of PA that have modifiable barriers within. Taylor, Lawton and Conner (2013) argue, through the development of the DPAQ tool, that barriers to behaviour change can be identified across 11 key psychosocial domains of PA behaviour change. The DPAQ is developed from the TDF as per Cane *et al.* (2012).

The findings of the current research show that less-active people with SMI may experience stronger barriers to PA in the domain of '*Motivation and goals'*. However, '*Motivation and goals'*, which is included in the DPAQ tool and adapted from constructs identified in the TDF (Michie, Johnston, Francis, Hardeman, & Eccles, 2008), is not specifically used to examine barriers to PA in the recent paper which also utilised the TDF in SMI/PA research by Glowacki *et al.* (2017). Instead Glowacki *et al.* (2017) draws from domains refinement work of the TDF for general behaviour change (Cane et al., 2012), where '*Motivation and goals'* were divided into the new domains: '*Goals*' and '*Intentions*'. In their review, Glowacki *et al.* (2017), indicated that '*Intentions*' is a domain where barriers to PA among people with SMI are prominent. Therefore, the present findings largely align with the literature, but extend this, demonstrating that less-active individuals with SMI may have stronger barriers with regard to '*Motivation and goals'* for PA.

The findings from the current research indicate that barriers to PA in relation to '*Beliefs in the consequences'* are more pronounced among less active people with SMI comparable to active counterparts. Prior research has shown over 70% of people with SMI strongly agree that health benefits are achievable from PA (Carpiniello, Primavera, Pilu, Vaccargiu, & Pinna, 2013; Ussher et al., 2007). However, the domain '*Beliefs in the consequences'*, is not prominent in the literature that has previously applied the TDF for examining barriers to activity for people with SMI (Glowacki et al., 2017). In addition, Firth *et al.* (2016) called for a greater focus on supervised PA rather than educational or motivational components in activity interventions for MH. Based on the current findings, such steps to remove educational components from interventions should be done with caution. It is possible that less active people with SMI still require education on the benefits of PA; the removal of such education may only be appropriate for SMI populations with established autonomous regulation (Vancampfort, Moens, et al., 2016).

Although not statistically significant, our findings indicated that participants that were active have stronger barriers in relation to '*Social influence'* when compared to less active counterparts which relates to support from peers and family, rather than mental health professionals. It should be noted that between-groups, the mean and standard deviations combined, leaves considerable room for type 1 error. It is also noteworthy to focus on the discrepancy between mean scores for '*Social influence'* between the current study reported here and that of Taylor *et al*. (2013) (See Table 4-4). Despite this, the prominence of barriers to PA in the domain '*Social influence'* remains unclear. It is possible that this speaks to a greater level of autonomous regulation among more active participants, whereby PA is pursued independently (Vancampfort, Madou, Moens, *et al.*, 2015), rather than in structured groups. Perhaps the widely documented prominence of facilitators to PA within this domain may be contribute to this (Gross *et al.*, 2015; Glowacki *et al.*, 2017). The developing role of peer-supported physical health interventions; although still lacking primary evidence for efficacy, is one approach for overcoming barriers that may impact this domain (Stubbs, Williams, Shannon, et al., 2016).

The findings from the DPAQ analysis of this current research showed no differences between active and inactive participants (based on PA guidelines) in relation to the following domains of PA behaviour change; '*Beliefs about capabilities'*, '*Knowledge*', '*Goal conflict'*, and '*Environmental context and resources*'. Yet, this should not be misconstrued as an absence of barriers in these domains. In the analysis of results, mean DPAQ scores from non-SMI populations (reported in Taylor *et al.* (2013) are shown alongside the DPAQ scores from the findings of the current research (See Table 4-6). While these findings are not directly comparable, they provide a point of interest in that mean DPAQ scores indicate stronger barriers to PA for people with SMI compared to non-SMI populations across all domains, but particularly pronounced for '*Beliefs about* *capabilities'*, '*Skills*', '*Environmental resources'*, '*Social influences'*, and *'Emotion*' were shown.

Similar to the observation made in the previous paragraph, the review of barriers to PA in people with depression by Glowacki *et al.* (2017), which also is also informed by the TDF, shows a prominent barrier in '*Beliefs about capabilities*', '*Environmental context and resources'*, and '*Emotion*' among people with depression (Glowacki et al., 2017). The similarity between the current research findings and this review delineate clear areas where barriers to PA for people with SMI were heightened and therefore should be the focus for interventions with SMI populations generally. Despite such similarities, the diversity of diagnoses within the current sample suggests the need for further work in relation to framing barriers and facilitators to PA across diagnostic groups.

Barriers to PA such as avolition, poor mental state, and fatigue are widely reported in the literature (Firth et al., 2016). Classifying these barriers under the domain area 'Emotion', Glowacki *et al.* (2017) found this domain to be the most commonly reported for people with depression. As already discussed, the findings presented here concur with the assertion of the prominence of 'Emotion' related barriers when compared to non-SMI data from Taylor *et al.* (2013). No differences in the strength of barriers in the area of 'Emotion' between active and less-active participants in this study were seen, showing that barriers in this regard are not specifically experienced by the less active people with SMI.

The findings of Study 1 (A) shown in this section bring forward a number of concepts which are taken forward into Study 2, in addition to Co-design work of Study 3. For instance, this research highlights the low levels of more intense PA being undertaken by rehabilitation and recovery MH service users. The considerable low amount of vigorous PA being attained warrants exploration during Study 2. This will allow for understanding of how this type of PA is experienced by service users, but also service providers. This research also highlights the challenges that people with SMI have in relation to motivation for PA. As this issue is prolific in the literature, this issue will be carried forward into co-design work and make up part of the discussion during emotional mapping stages of Study 3 (Chapter 6).

4.5.2 Study limitations

This study had a number of methodological limitations. First, there are inherent limitations to self-reported cross-sectional data. It is argued that OBM research be carried out to contextualise the PA levels findings of this current research, and to also go further providing more in-depth analysis of PA levels and SB, as SRQs are limited in their capacity (Soundy, Roskell, et al., 2014). This limitation has been highlighted previously and is the impetus for Study 1(B).

This study demonstrates where differences between active and inactive people with SMI differ with regard to barriers to PA. Regardless, the cross-sectional nature of the study prevents any cause and effect inferences being put forward from the analysis. Furthermore, the convenience sampling strategy adopted in this research means that volunteer participants may have had a different propensity for PA than those that did not participate in the study.

A number of key variables that have the potential to influence PA were not measured. These are anthropometric measurements, alcohol use and smoking status and differentiation between affective disorders. Research by Jerome *et al.* (2009), already discussed as comparable in relation to poor levels of PA among outpatients with SMI specify that their sample are all obese or “overweight” as defined by the authors. As such, the level of PA among participants may be reflective of a more sedentary population. No data were obtained in the current research in relation to body weight and BMI. This is therefore a limitation of the current findings.

Data on duration of participants' illness and data on socio-economic status were not obtained. However, research with a sample from Irish rehabilitation and recovery participants has previously shown a mean duration illness of ≥ 20 years. Furthermore, 50% were unemployed, 40% were in supported employment schemes, and only 10% were in open or voluntary employment (Lavelle et al., 2007). It is likely the current research sample is comparable here in these respects.

This study used two measurement tools; the DPAQ (Taylor et al., 2013) and 3Q assessment of PA (Smith et al., 2005). Neither tool has undergone validation in a SMI population. That being said, each tool was selected specifically for use based on research which supports the use of each. The 3Q assessment of PA has been used in this research on account of its development specifically for clinical populations and its simplicity of use and minimal participant burden. In doing so, careful consideration was afforded to other SRQs that have previously been used in SMI populations. However, there are clear limitations within these exiting SRQs. While this is a fundamental challenge for this research project, there are also noteworthy benefits to SRQ research, such as low participant burden to maximise sample size which will undoubtedly have relevance in such a vulnerable population, where no quantitative Irish data yet exists. It is also important to note that the 3Q does not have the capacity to measure SB. The relevance of SB independent of PA has been elucidated earlier in sections of Chapter 2. With this in mind, this research recommends further OBM research to better understand the PA and SB of an Irish sample with SMI.

Study 1 B

4.6 Background

Physical activity epidemiology considers SB and low levels of PA as distinct behaviours which act independently in increasing cardiometabolic risk for the individual (Biswas et al., 2015; Katzmarzyk & Lee, 2012; Stamatakis et al., 2019). In SMI populations, prolonged SB are associated with increased antipsychotic dosage, higher body mass index and reduced CRF (Vancampfort, Sienaert, et al., 2016).

4.7 Aims and objectives

The aim of Study 1 (B) is to measure PA and SB levels among a small sub-sample of outpatients with SMI in rehabilitation and recovery MH services in order to strengthen the findings of Study 1 (A) by utilising objective based measures of PA.

The study objectives are: (i) To measure PA levels of outpatients with SMI in rehabilitation and recovery MH services using a hip-worn ActiGraph accelerometer device. (ii) To measure SB of outpatients with SMI in rehabilitation and recovery MH services using a hip-worn ActiGraph accelerometer device.

4.8 Methods: Study 1B

Expanded details of the methods and methodologies for Study 1 (B) are detailed in Chapter 3. This section provides a brief description of the processes and detailed information of the analysis that informed the results.

4.8.1 Research design

This study utilised a cross-sectional design to objectively measure SB and PA levels of people with SMI in rehabilitation and recovery MH services in in the south east of Ireland.

4.8.2 Participants and recruitment

Participants were eligible if they were attending outpatient rehabilitation MH services for a diagnosed mental illness (ICD-10). Participants were excluded where evidence of significant cardiovascular, neuromuscular, or endocrine disorders limiting regular ambulation (as per American College of Sports Medicine absolute contraindications to exercise) were present. Participants were also excluded in the case of having diagnosed anorexia nervosa or bulimia, or in the case of an organic brain disorder; estimated IQ < 70 or MoCA score <=26. Participants were also excluded when if they were experiencing acute paranoia.

4.8.3 Procedures

A convenience sampling strategy was adopted. All participants provided written informed consent. Data collection was localised to two counties (as per restrictions in number of available devices). Within this area, specialist rehabilitation and recovery MH service day centres (N=2) and high support residential facilities for rehabilitation service users live (N=3) were accessed to obtain a sample. Advertisements were placed at each facility where participants were being recruited. In addition, a gatekeeper was identified within each facility. This individual assisted in the recruitment of volunteer participants and acted as a co-signatory on informed consent documents. Eligible participants were issued with an Information Sheet (Appendix 9) and an Accelerometer Information Form (Appendix 10) and a verbal explanation of the procedures. All participants provided Informed Consent (Appendix 11).

4.8.4 Data collection tools

Demographic data on participants were obtained using the SIMPAQ Demographic & Diagnostic Sheet (Appendix 12). Physical activity and sedentary behaviour were measured using a tri-axial ActiGraph GT3X or GT3X+ accelerometer (*ActiGraph, LLC,* *Florida*). Accelerometers were placed on the right hip using an elasticated strap. Participants were asked to the devices for 7 days (minimum requirement of 3 days. All accelerometer devices were distributed by the researcher following protocols of the SIMPAQ validation study at SIMAPAQ.org. Data were extracted using Centrepoint and analysed using ActiLife v6.11.5 software. ActiGraph devices were initialised to record data at specified time intervals (epoch) of 10 seconds.

4.8.5 Data analysis

Wear-time of six hours /day for a minimum of three days was set as the minimum criterion wear-time. This criterion wear-time has been previously used to minimise in-valid wear among SMI populations (Kruisdijk et al., 2017). Time periods of 90 minutes or more with consecutive zero counts were considered non-wear times (Choi, Liu, Matthews, & Buchowski, 2011). Accelerometers measure vertical and horizontal accelerations as counts which provide a calculated indication of PA associated with locomotion (Troiano et al., 2008). Cut points of Sedentary (<100 counts per minute) (cpm), Light intensity (100 cpm – 2019 cpm), Moderate intensity (2020 cpm- 5998 cpm), and Vigorous (>5998 cpm) were used to classify PA and SB (Troiano et al., 2008). Total activity counts/per hour provide a proxy measure of total volume of PA, offering one option of comparison between accelerometer studies (Bassett et al., 2015). Total activity counts/per hour were calculated for each individual case.

All data were analysed using SPSS version 22, including demographic and descriptive analyses. All PA and SB data were normally distributed with the exception of vigorous intensity PA; as such, parametric testing was carried out including *t*-tests.

4.8.6 Ethical approval

Ethical approval for the methods specified for Study 1 (B) was initially approved by Medical Research Ethics Committees of the University of New South Wales, Sydney

Australia. In addition to this, the study protocols specifically relating to the use of ActiGraph accelerometers were confirmed with the Health Product Regulatory Authority of Ireland as per the request of HSE Research Ethics Committee. ActiGraph GT3X or GT3X+ accelerometer (*ActiGraph, LLC, Florida*) devices are approved to be sold as medical devices according to the European Union's regulatory requirements: EN 60601-1: 1988 + A1: 1991 + A2: 1995 – Medical Electrical Equipment Part 1: General Requirements for Safety. Study 1 (B) obtained ethical approval from the HSE South-East Research Ethics Committee and the Research Ethics Committee of Waterford Institute of Technology (Jan 2017). De-identified data were stored on password protected WIT computers. Questionnaires were stored in a secure filing unit in Waterford Institute of Technology.

4.10 Results

4.10.1 Health and clinical demographics

The participating sample in Study 1 (B) was N=17 people with diagnoses of one or more SMI (ICD-10) accessing outpatient rehabilitation mental health services in SECH region of Ireland. In Table 4-10 (below) the broad demographic and health characteristics of the participating sample are reported. It should be considered that cross-over may exist between some of the shown categories. The majority of participants were male, 82% had a primary diagnosis of schizophrenia or psychotic illness; and were taking antipsychotic medication. The mean age of participants was 45 years (SD 11.7).

Table 4-10 Socio-demographic and health characteristics of sample

Demographics	**n (%)**
Total sample	17 (100)
Sex	
Male	14 (82)
Female	3 (18)
Age	
Diagnosis	
Schizophrenia/ Psychotic disorder	14 (82)
Bipolar disorder	1 (6)
Major depression	3 (17)
Anxiety disorder	5 (29)
Obsessive compulsive disorder	1 (6)
Neurocognitive disorder (MoCA)	3 (17)
Residential status	
Independent/community-based	5 (29)
High support residential facility	12 (71)
Comorbidity	
Diabetes mellitus	5 (2)
Elevated total cholesterol	9 (53)
Hypertension	3 (18)
Chronic pain	2 (12)
Taking psychotropic medication	
Antidepressants	5 (29)
Antipsychotic	16 (94)
Mood stabilisers	2 (12)
Cross-over present in diagnoses and psychotropic medication variables	

The analysis of data showed 77% of the sample were overweight or obese based on Body Mass Index calculations. The remaining 24% were within normal BMI ranges. Sixty five percent of the samples were tobacco dependent users. Only one participant was in contractual employment.

4.10.2 Physical activity and sedentary behaviour

All participants met the minimum required wear-time of three days, although there was variability in the consistency across the sample in relation to this. The median number of valid days of wear was 5 (*IQR* 4.5-6.5). A mean wear-time of 5458 minutes (*SD* 1300*; SE* 315) was shown across the sample.

Data showed that participants spent an average of 7.8 h/day (465 mins/day, *SD* 141.92) in SB. Accounting for all valid wear-time, participants spent 73% of their time in SB. Across the sample sedentary bouts were shown at median of 47.3 minutes (*IQR* 34.4 – 76). Light intensity PA accounted for 22% of valid wear-time, moderate intensity PA accounted for 5% of valid wear-time. Finally, 0.5% of wear time was spent in vigorous PA. Participants had a mean amount of MVPA of 57 minutes/day (*SD* 24.1; *SEM* 5.9).

While not statistically significant, participants residing in high support accommodation (N=12) had lower levels of total wear-time SB when compared to participants living in low dependent residence in the community. Community dwelling participants (N=5) had higher levels of total light intensity PA in comparison to those in high support residential facilities (*p*= .047). A summary of these results is presented in Table 4-11 below. Data from a study with people with SMI accessing inpatient services in the Netherlands has been included here to serve as a comparison (Kruisdijk et al., 2017) here.

Table 4-11. Physical activity and sedentary behaviour findings and comparison study

Variable	**Current research**	**Kruisdijk et al. (2017)**
N	17	184
% Female	18 (n=3)	41 (n= 76)
Mean age	45 (sd 11.7)	57 (sd 12.8)
Wear time during measurement hours	91 (sd =21.6)	54.6 (na)

Total activity counts per hour	24295 (18105)	24527 (14822)
Intensity		
SB time (%)	73	84
Light PA (%)	22	10.5
MVPA (%)	0.5	5.9

4.11 Discussion

A primary aim of Study 1 generally is to examine PA and SB of people with SMI in outpatient rehabilitation mental health services. Within the literature, there is discrepancy between SBs measured by SRQ versus OBM (Soundy, Roskell, et al., 2014; Stubbs, Williams, Gaughran, et al., 2016). With this considered, it was deemed necessary to carry out Study 1 (B) in addition to Study 1 (A) in order to objectively measure PA and SB of outpatients from rehabilitation and recovery MH services.

In the general population, SB serves as an independent risk factor from PA for early mortality of cardiometabolic causes (Katzmarzyk et al., 2009). In SMI populations research into SB is very much at an early stage. For instance, currently no trials exist where SB (<1.5 MET waking reclining or sitting) has been used as a primary outcomes measure (Ashdown-Franks et al., 2018). Much of the available research on SB and SMI appears to have taken place within the last three years (Stubbs, Williams, Gaughran, et al., 2016). Consequently, the exact health implications of prolonged SB for this population are unknown. Limited cross-sectional data on SB measured with SRQs has linked higher levels of SB with increased BMI, and higher doses of psychotropic medication which serves as a proxy measure of illness acuity (Vancampfort, Sienaert, Wyckaert, De Hert, Stubbs, et al., 2016). This potential effect on physical and MH is particularly concerning in the context of a population with compounded MH challenges. A 2016 RCT with healthy adults has previously shown deteriorations in scores of depression with just one week of SB (Edwards & Loprinzi, 2016). Similar cross-over trial by Endrighi *et al.* (2016) showed these mood deteriorations to be associated with interleukin-6 elevation within blood plasma. Therefore, the findings presented have broadly worrying implications for the wellbeing of people outpatients with severe mental illness in Irish rehabilitation MH care.

Accelerometery data is not easily comparable within the literature on account of broad device initiation and analysis criterion. Using the current study, a comparison has been drawn against a different study of 184 inpatients with SMI, which is presented against the results of the current study to contextualise the results (Kruisdijk et al., 2017). This step was undertaken as Kruisdijk *et al.* (2017) utilise total activity counts/hour as a proxy measure of total PA. In order to compare current data, this calculation was carried out within the current study. The findings presented in the current research show that participants spent 73% of their waking time in SB. This finding is favourable in the context of research from Kruisdijk *et al.* (2017). In interpreting these findings, one must consider that Kruisdijk *et al.* (2017) used a higher count cut point in relation to SB compared to the more liberal point (Troiano et al., 2008) applied here in this current research, but previously used in other ActiGraph research with SMI populations (Chapman et al., 2016). With this point considered, it seems data between both studies are comparable in the level of SB to a degree.

In the critical review which preceded this research (Chapter 2) an exponentially high rate of SB in excess of a pooled 11 hours/day for people with SZ was identified (Stubbs, Williams, Gaughran, et al., 2016). In the context of such research, the current findings of this Study 1(B) are favourable. However, almost all of the studies included in this review from Stubbs and colleagues that utilised OBM, bar one, were located in the USA. The one non-US study, which also used ActiGraph GT3X+ model accelerometers, showed a comparable 7.5 hours of daily sedentary time among a small sample with schizophrenia (Gomes et al., 2014). In addition, Chapman *et al.* (2016), showed that a sample of >100 participants who wore ActiGraph GT3X devices found a higher SB level among inpatient and community-based patients combined, indicating a median of 9.2 hours/daily of SB. However, this level of SB accounted for 65% of wear-time and as such show similarities of prolonged SB to the current research. Therefore the findings shown in the current research, while worrying in the context of the current deleterious health of mental health service users already discussed and specifically exemplified in Study 1(A), are broadly congruent with that of other research of a similar nature, showing excessive SB of people with SMI in other contexts. The findings of the current study support the need for a robust interventional approach to tackle SB as an independent risk factor as part of integrated rehabilitation and recovery MH care. Much of participants' accumulated PA that contributed to meeting NPAG in this research appeared to be achieved through light intensity PA, such as walking. These findings support findings of other cross-sectional research in the UK (Ussher et al., 2007) and Belgium (Vancampfort, De Hert, De Herdt, et al., 2013) showing that people with SMI typically prefer walking as their primary type of PA to engage with. Similarly, previous ActiGraph accelerometer research has shown relatable findings to that of this current research. One Australian study already discussed in the context of SB shows light intensity PA accounted for a median 30% (Interquartile range: 25-38%) of wear-time (Chapman et al., 2016).

No differences in PA levels of SB were seen between age categories including recoded age variables into binary categories (>or< 50 years of age). A cautious interpretation of results suggest that participants who are community dwelling are less sedentary and engage in more light intensity PA compared to participants in high support hostels. Previously inpatient hospital based participants typically have higher levels of MVPA compared to outpatients (Chapman et al., 2016; Vancampfort, Firth, et al., 2017). The findings of this current research are not directly comparable here as there are no 'inpatients' within this sample. However, the literature suggests that environmental differences between high supported hostels and community dwelling settings may exert an influence on PA in a manner that is similar to comparisons between inpatient and outpatients' settings. Yet, in this research the differences relate to better light intensity PA among those living in community settings. Further qualitative research may shed light as to reasons for such differences. It seems likely however, that that this favourable effect is as a result of patient being more 'stable' in their mental health and having higher levels of autonomous regulation over PA, or that participants engage in active transport to reach rehabilitation and recovery day centres, where those in high supported hostel do not.

It is notable that participants that reside in community settings, such as family homes and low support residential facilities, had greater levels of light intensity PA compared to those in high support residential facilities. While study 1(A) has used residence type as a proxy indicator of mental illness severity, a number of research studies have found better PA levels among inpatients (with likely higher illness acuity) compared to outpatient, as reported in meta-analyses with focused on BPD (Vancampfort, Firth, Schuch, et al., 2016) and transdiagnostic meta-analyses (Vancampfort, Firth, et al., 2017). While seemingly counterintuitive in the context of illness acuity, this phenomena is considered a reflection of PA policy infiltration into practice, with inpatient service users having more access to structured PA and exercise (Fraser et al., 2015a; Fraser et al., 2015 b; Vancampfort, Firth, et al., 2017). Interestingly however, a separate meta-analyses in 2016 shows that an exception to this greater propensity for increased PA among inpatients can be found in relation to specifically light intensity PA and in relation to diagnoses of SZ illness (Stubbs, Firth, et al., 2016). In the current study the overwhelming majority of participants also had diagnoses of SZ. It is postulated that this increased light intensity PA may be an indication of active travel to access MH services during the day where participants of high support may avail of on-site services or service provider transport.

At this point, Study1(B) has provided unique data for an Irish context in relation to patterns of excessive sedentariness among persons with SMI in rehabilitation and recovery care. This data will be subsequently used to provide a greater understanding for participants that engage with the co-design, Study 3 (Which is detailed in Chapter 6). The concept of sedentary behaviour is likely to be less well understood among participants of this, and so this objective data positions the co-design components to provide solutions to this objective challenge.

4.11.1 Study limitations

This study is limited by its small sample size of available participants (N=17) on account of limited resourcing and availability of ActiGraph accelerometer devices. With this in mind, the author is cognisant of the potential for Type 1 error within data analysis. In addition to this, this study used a convenience sampling strategy, which suggests that the findings should be viewed with some caution, as there were no attempts at randomisation in the selection of the sample. The small sample used, which is consequentially non-representative 3-7 day wear of accelerometery. This wear-time criteria also carriers with it considerable participant burden, and as such, it is likely that participants that agreed to participate were mostly interested in PA or becoming more physically active.

The existing accelerometery research in this field has unfortunately very little consistency with regard to methodology applied. A number of studies have used different accelerometer devices, such as the ActiGraph AM-7164 (Janney et al., 2014), RT3 (Faulkner et al., 2006), and SenseWear arm-bands (Bueno-Antequera et al., 2017). As a result there is no clear consistency within the literature regarding sampling frequency, epoch length, use of uniaxial data or other, wear-time specification/validation or cut off points to be applied to data (Kruisdijk et al., 2017). In many regards, data were restricted to methodology applied to the SIMPAQ validation study (Rosenbaum et al., 2019). In addition to this, liberal criterion in relation to wear-time were aligned with research that had used the same ActiGraph GT3X devices (Kruisdijk et al., 2017), and similarly cut points applied from Chapman *et al.* (2016). However, this research, similar to Kruisdijk et al., (2017) calls for consensus research to develop standardised criteria around these points.

4.12 Chapter summary and conclusions

A central aim of Study 1 (A & B) was to examine levels of PA and SB of people with SMI in rehabilitation MH care. To meet the collective aims of this study, it was decided that the most appropriate approach to take was to divide the study in to two parts, (A) which utilised self-report measures, and allowed for a large sample size relative to the population of the SECH to be accessed and Study (B) which utilised OBM of PA and SB allowed for more accurate measures of PA and in particular SB.

The findings of this study were comparable to other research with outpatient SMI populations regarding physical activity guidelines; but constitute the first data of this kind from Ireland. Despite comparable findings, a worrying majority of people with SMI in Ireland do not meet PA guidelines according to SRQ data, and have high levels of SB according to OBM data. Measuring PA levels by the use of SRQ has inherent limitations with respect to tool accuracy and appropriateness. While cognisant of this issue, this research attempted to mitigate against the limitation of SRQ research by focusing broadly on PA guidelines as an outcome measure, and additionally using OBM to supplement the data gathered where possible. In this regard, the PA guidelines offer a more broad reflection of PA levels that are measurable by SRQ and consistently serve as a marker of physical and MH adaptation in the literature.

In this study, no differences were found between those meeting and not meeting guidelines in relation to diagnoses and clinical variables measured. However older participants it seems, appear to engage in less moderate/vigorous physical activity, requiring further study to understand context specific underpinning of this finding. Moreover, the findings of this current research concur with previous research showing the prominence of barriers to physical activity in the determinant areas of ‘Emotion’, and ‘Motivation and goals’ and provide further evidence that less-active people with SMI experience stronger barriers in relation to ‘Motivation and goals’ when compared to more active counterparts. In addition, less active people with SMI also experienced significantly stronger barriers than active people with SMI in the domain ‘Beliefs in the consequences’ to physical activity. Therefore this research advocates that in addition to addressing the well-established barriers to physical activity for this population (Firth et al., 2016; Glowacki et al., 2017; Soundy, Faulkner, & Taylor, 2007), future PA programmes aimed at less active individuals should place additional focus on these areas, using education and motivational techniques. Addressing specific barriers for less active people with SMI is an indicator of some factors which have created the current implementation gap (Rosenbaum et al., 2018).

The findings from Study 1(A) and Study 1(B) in relation to PA levels and SB, are here taken forward as issues which are to Study 3 (Co-design) to provide a contextual understanding and evidence of the current behaviours that exists in services to prompt solution focused co-design work. In addition, the key finding from Study 1(A) which pertain to key influencing factors on PA are taken forward to Study 2, where issues will be explored in greater depth through in-depth multi-stakeholder interview inquiry (See chapter 5 for result of Study 2). This layered understanding of influences on PA will then also be brought forward into the co-design process (Study 3), where themes from Study 2 are used during co-design work (Chapter 3, 3.8.3 for more detail).

Chapter 5

Exploring the experience of physical activity in rehabilitation mental health

Chapter 5: Exploring the experience of PA in rehabilitation mental health settings

Study 2

5.0 Introduction

There is evidence to suggest that people with SMI who engage with PA interventions, can have good intervention adherence (Holt et al., 2018; Stubbs, Vancampfort, et al., 2016). However persons with SMI do not readily engage with PA that is provided within the routine MH care environment, outside of intervention scenarios (Brand et al., 2016). This contrast between research and practice suggests that PA and SB interventions do not have good translational impact, and therefore a 'translation gap' has been opened between research and practice (Deenik et al., 2019). As alluded to in Chapter 2, Section 2.5, qualitative research has a valuable role to play in providing useful insights on this 'translational gap' by contextualising and helping programme developers to understand the experience of PA during SMI (Rebar & Taylor, 2017).

In Chapter 2, Section 2.4 a number of systematic reviews have shown the key correlates of PA for people with SMI (Vancampfort, Correll, et al., 2013; Vancampfort, Knapen, et al., 2012; Vancampfort, Stubbs, et al., 2015). Additionally, a number of recent meta-analyses have comprehensively mapped the barriers and facilitators to PA for people with SMI (Firth et al., 2016), which are thought to provide useful evidence for policy makers in relation to identifying factors that are modifiable, so as to effectively develop PA programmes for clinical practice. Each of these reviews has carried out positivist inquiry with service users alone, and so, with respect to programme development, it seems pertinent that a wider picture in relation to the influencing factors and experiences of PA may be at play, and should be explored in the pursuit of programme development from across the spectrum of stakeholders. This is particularly important in the context of the

MWRP, which is linked to the EBCD approach and therefore requires more interpretivist input.

5.1 Background to qualitative inquiry

Qualitative research has previously been shown as an effective approach to inquiry to understand why people with SMI engage and sustain PA, by getting to the raw experience of PA participation (Soundy et al., 2014). Firth *et al.* (2016) argue that the limitations of positivist inquiry with regard to the factors that influence PA and SMI play to the strengths of qualitative research. For instance, existing qualitative research has explored a number of phenomena that appear unclear within positivist quantitative research. For example, the value of support is evident in the qualitative literature (Mason and Holt, 2012; Gross *et al.*, 2015). Previous RCTs where PA levels and anthropometry have not been effected are in some instances considered ineffective (Holt et al., 2018). Yet, closer inspection of the findings of this RCT by Holt and colleagues, show people with SZ obtaining considerable benefits in relation to increased social opportunities, which may be profoundly beneficial in many respects. In the context of what constitutes value in the journey of recovery (Higgins & McBennett, 2007), such outcomes perhaps warrant greater exploration and emphasis within the research field. There is only a small number of qualitative research studies that have endeavoured to explore experiences of PA in their contribution to the journeyed recovery (Hargreaves et al., 2017; Pickard et al., 2017; Tetlie, Heimsnes, & Almvik, 2009). However, Hargreaves *et al.* (2017) and Pickard *et al.* (2017) did not include the perspectives of MH service providers or other key stakeholders, and Tetlie *et al.* (2009) focused on secure forensic services. As such, all of these key studies are limited with regard to understanding this concept among outpatients.

Exploring the concept of the journeyed recovery and what that entails is not easily captured within positivist quantitative research methodologies (Slade et al., 2012). Instead, this conceptual issue is available to be mined from experience. Phenomenology, as discussed in Chapter 2, is a discovery orientated science and philosophy interested in mining and exploring the meaning of experience in a thoughtful manner, free of, or at least cognisant of prejudice and assumption (van Manen, 2007). There is considerable qualitative research published in the area of PA and SMI (Mason & Holt, 2012; Soundy et al., 2014), which has been updated and brought together in this current research (Chapter 2, Table 2-2).

Only five considerably heterogeneous studies exist which have adopted phenomenological type inquiry to provide an in-depth exploration of experience of PA during SMI or recovery (Hargreaves et al., 2017; Johnstone et al., 2009; Pickard et al., 2017; Tetlie et al., 2009; Wright et al., 2012). Within these studies, analysis has taken an idiographic qualitative research approach to analysis where the study is rooted in Interpretive Phenomenological Analysis as framed by Smith (1996a). The remaining studies (Hargreaves et al., 2017; Pickard et al., 2017), took more broad interpretivist epistemologies, but further utilised hermeneutic phenomenology of van Manen (1997) to shape their methodology and analysis rather than pursuing Interpretive Phenomenological Analysis (IPA) which is an analytical approach on to itself (Smith, 1996a).

5.1.1 Visual methodologies in qualitative research

Qualitative research approaches can also be adapted and strengthened by diverse and flexible methods, such as visual methodologies (Denzin & Lincoln, 2008). One example of this visual methodology in qualitative research is photo-elicitation and autography. Photo-elicitation is using existing photographs and/or images to generate discussion. Autography requires asking research participants to generate photographs by taking pictures, which are then used during interviews to create discussion. Both concepts seem highly applicable to health, and in particular psychiatry research (Glaw, Inder, Kable, & Hazelton, 2017). These visual methods encourage participant reflection, bridge communication challenges between researcher and participant and acknowledges that the participant is expert in their own experiences (Glaw et al., 2017). This last concept is beneficial in a sense that it is fitting of the recovery journey concept (Higgins &

McBennett, 2007). Two examples within the relevant literature of PA and SMI have been identified for their use of this approach. These are; one study which has used autography (Gorczynski et al., 2013), and a separate study that has used photo-elicitation (Pickard et al., 2017). Autography largely speaks to ethnographic research. Here the participant takes the photograph to use during inquiry. In doing so (taking the photo), the participant has already positioned themselves within the topic of inquiry. Recently however, difficulties have arisen in the use of autography in health research; this visual methodology has unclear boundaries with regard to data protection, confidentiality and copyright in analysing and disseminating the research (Balmer, Griffiths, & Dunn, 2015). Photo-elicitation on the other hand, offers a more simple strategy that is still a useful methodology for investigating meaning in individuals lives, particularly where communicative challenges may exist (Glaw et al., 2017). This appears to be a particularly powerful method for phenomenologically informed research that taps into lived experience (Pickard et al., 2017). Hermeneutic phenomenology acknowledges the role of researcher interpretation within the inquiry process (van Manen, 2007). Considering this it seems plausible that photo-elicitation may help to ground researcher interpretation, particularly where the researcher is an ‘outsider’ from the service.

5.1.2 Context sensitive research

Mental health services in Ireland are now focused on delivering a recovery approach to care. One principle underpinning this approach is partnership (Department of Health and Children, 2006; Health Service Executive, 2018). To date, PA and SB research in SMI populations have largely neglected the importance other key stakeholders in the therapeutic partnership and the significant role that they can play in understanding and implementing PA for this vulnerable population (Vancampfort & Faulkner, 2014). Ireland is unique in its approach to PA and SB within MH services such as rehabilitation MH care. The void in structures, such as integrated exercise professionals, places a leadership role in the hands of all stakeholders involved in the therapeutic alliance (Matthews, Cowman, & Denieffe, 2018). While the absence of exercise practitioners is noted as a limitation to good care, it must also be considered that MH nurses in other contexts and branches of health care lead on PA and SB. For instance, in the UK, 76% of PA general nurses agree that monitoring PA lies within their remit and a further 28% of those surveyed believed they had a role in referring to other PA opportunities.

The unique Irish landscape in relation to PA provision in MH care contexts undoubtedly has influence on the experiences that people with SMI have in pursuing PA. There is currently only two studies that have investigated the influences on PA for people with SMI in Ireland (Cullen & McCann, 2014; Iwata et al., 2016), where social and policy factors are unique, and PA resources within MH settings are limited (Matthews, Cowman, & Denieffe, 2018). Cullen & McCann, (2014) provides a good indication of MH service users perception of the role that PA has in care (Cullen & McCann, 2014). However, the analysis lacks depth of exploration, with no consideration of theory and also neglects to include a multi-stakeholder perspective, which limits the translational impact of the findings. In Iwata *et al.* (2016) descriptive exploration of the calming effects of a PA programme are well documented. However, this paper deals with a specific woodlands walking project for people in accessing private mental health care and so, is also limited in its capacity to provide translational knowledge, which has implications for the MWRP.

5.1.3 Multidisciplinary inclusion in qualitative research

At present, a small body of literature has included MH service providers in carrying out inquiry on PA for people with SMI. Much of this literature to date has focused on the service providers personal barriers to PA implementation (Way, Kannis-Dymand, Lastella, & Lovell, 2018), as opposed to the experience of involving people with SMI in PA. Studies that have taken this second approach, while highly informative, have largely centred on the experience of the MH nurse to date (Carlbo et al., 2018; Happell, Scott, Platania-phung, et al., 2012; Leutwyler et al., 2012). Where qualitative research sampled carers and family in relation to their perspectives on physical health and SMI, physical activity is not discussed in detail (Happell et al., 2016). In addition to this limited information from research involving carers, the studies mentioned here neglect to include key-stakeholders such as prescribing doctors, occupational therapists and peer-support workers, all of whom may have a valuable role to play in this context of the MWRP development, as this programme will have to draw on existing MH resources. Therefore, the perspectives of other stakeholders that are less well represented in the literature would seem a valuable contribution to include in future research. This multi-stakeholder perspective is also reflective of a recovery approach to MH care, which by definition should also permeate service level research (Health Service Executive, 2018).

An emerging feature of multidisciplinary team working in MH settings is the addition and growing interest in the use of Peer Support Workers (PSW) to enhance the therapeutic endeavours of services. In this context, PSW refers to a person with a history of SMI but significantly recovered and now employed by the MH services to offer support and or services to other users of the MH services (Davidson, Chinman, Sells, & Rowe, 2006). The individuals can have unique personal experiences of illness which can be instrumental in delivering person-centred empathetic care for people with SMI. As such, PSWs now serve as a cornerstone within recovery orientated mental health strategy, such as in Ireland (Davidson et al., 2006; Higgins, 2008; Higgins & McBennett, 2007). The presence of PSWs in promoting, supporting and delivering PA interventions specifically appears to be a growing but early stage phenomena (Stubbs, Williams, Shannon, et al., 2016); a review to examine the effect of such interventions is underway by the current researcher and colleagues (PROSPERO Register: CRD42019122178). Regardless, to the researcher’s knowledge, no studies have included PSWs in qualitative research of PA experiences for people with SMI. It is likely that doing so would glean a unique perspective which inhabits the middle ground between receipt of care and delivery of care.

5.2 Aims and objectives

The aim of Study 2 was to explore experiences of PA and SB as it occurs in structured and unstructured forms within outpatient rehabilitation mental health services for people with SMI from a multi-stakeholder perspective. The study objective is to carry-out one-to-one interpretivist interviews with key stakeholders to explore experiences of PA and SB, in order to contribute knowledge for the development of a PA programme for rehabilitation and recovery MH services (MWRP).

5.3 Methods

A detailed description of the methodological process for Study 2 are shown in Chapter 3 with the exception of information on data analysis. As such, this data analysis information is shown in the below section, in addition to a brief overview of key method taken during Study 2.

5.3.1 Research design

The aim of this study was to explore experiences of PA and SB as it occurs in structured and unstructured forms within outpatient rehabilitation MH services for people with SMI from a multi-stakeholder perspective. A qualitative exploratory design with an interpretivist position, underpinned by van Manen's (1997) hermeneutic phenomenology was used.

5.3.2 Procedures

Stratified convenience sampling was used to recruit multidisciplinary participants to the study. In the current research, a criterion sampling strategy was used, ensuring the inclusion of key stakeholders not well represented in the literature were among the sample. The study was advertised in all relevant outpatient rehabilitation MH services facilities across two counties in the South-East of Ireland. Eligible participants were provided with an Information Form for service user or service provider (Appendix 10). The Information Form contained contact information for the researcher for participants to make follow-up contact for interviews.

5.3.3 Participants and recruitment

Eligible participants in the sample were from all relevant stakeholder roles, including MH service users, MH nursing staff, Management, Occupational Therapy (OT), Medicine/Psychiatry, Peer-Support Workers and Family Carers/Carers. Eligible participants were invited to make to make an appointment with the researcher to attend an interview. Information on eligibility and exclusionary criteria are shown in Chapter 3.

5.3.4 Data collection measures

One to one semi-structured interviewing interviews were carried out by the researcher with all participants. Each interview commenced with a photo-elicitation exercise to ground the interview. Participants were asked to discuss their own experiences of MH services with regard to a series of photographs showing them different modalities of PA: 1. A walking group; 2. A structured sporting match; 3. Gym equipment in a MH facility; and 4. Cycling to work (Figure 3-1). This allowed for probing of PA experiences that may have been evoked by the images, but would otherwise be inaccessible, particularly for those with communication challenges (Glaw et al., 2017).

All interviews were also guided with the assistance of a topic guide (Appendix 16). interviews were carried out in a way which featured a number of open ended questions broadly framed from the domains contained within Social Ecological Models of PA (Sallis et al., 2006). Interviews were audio recorded and transcribed.

5.3.5 Data analysis

Interview data were transcribed verbatim. Transcripts were uploaded to QSR Nvivo 10® software where data transcripts were subject to multiple readings by the researcher and notes were made throughout the process and in addition field notes taken during interviews were read through by the researcher and noted against the master transcripts. Data were subject to Thematic Analysis (TA) (Braun & Clarke, 2006). Thematic analysis is a widely accepted method of inductive analysis in qualitative literature for health related fields (Braun & Clarke, 2006). In essence, TA is a method for active researchers to identify and analyse patterns in data, known as themes which allows for rich descriptive reporting and new interpretations of meaning within the data. Thematic analysis was adopted in this research on account of its flexibility, particularly in relation to theoretical flexibility, making it suitable for interpretivist paradigms and both inductive and deductive coding of data (Braun & Clarke, 2006; Clarke & Braun, 2017). Braun and Clarke stress that while TA is theoretically flexible, it does not absolve the researcher of their epistemological and or theoretical commitment. Braun and Clarke offer six key stages of TA which were followed during the analysis process, these include: familiarisation with data; generating initial codes; searching for themes; reviewing themes and producing the report. A description of the key TA steps taken during Study 2 is shown in Table 5-1. It should be noted that the TA used was iterative and developmental. As such, themes were not fixed, but rather open to change, merge and reduce during the process (Braun & Clarke, 2006).

Table 5-1. Phases of Thematic Analysis

The phases of thematic analysis, (Braun & Clarke, 2006)	
Familiarisation with data	• Transcription • (Re) read • Note initial ideas
Generating initial codes	• Coding interesting features in data systematically
Searching for themes	• Collating codes into potential themes • Gathering all data relevant to each theme
Reviewing themes	• Checking the themes work in relation to coded extracts and entire data set • Thematic map generation
Producing the report	• Final analysis • Final extract selection • Relating back to the RSQ and literature • Scholarly report

5.3.6 Ethical approval

Ethical approval for the study was granted by Waterford Institute of Technology and The HSE South-East Research Ethics Committees. Key measures that were implemented in order to meet the requirements of the two relevant Research Ethics Committees are described in Chapter 3.

5.4 Findings

Thematic analysis uncovered two salient themes. 1. The challenge of being physically active in recovery. 2. Physical activity enables recovery. Within each theme, a number of subthemes were identified within the data. A thematic map of these themes and subthemes together is presented in Figure 5.1 which follows the participant description table.

5.4.1 Participant description

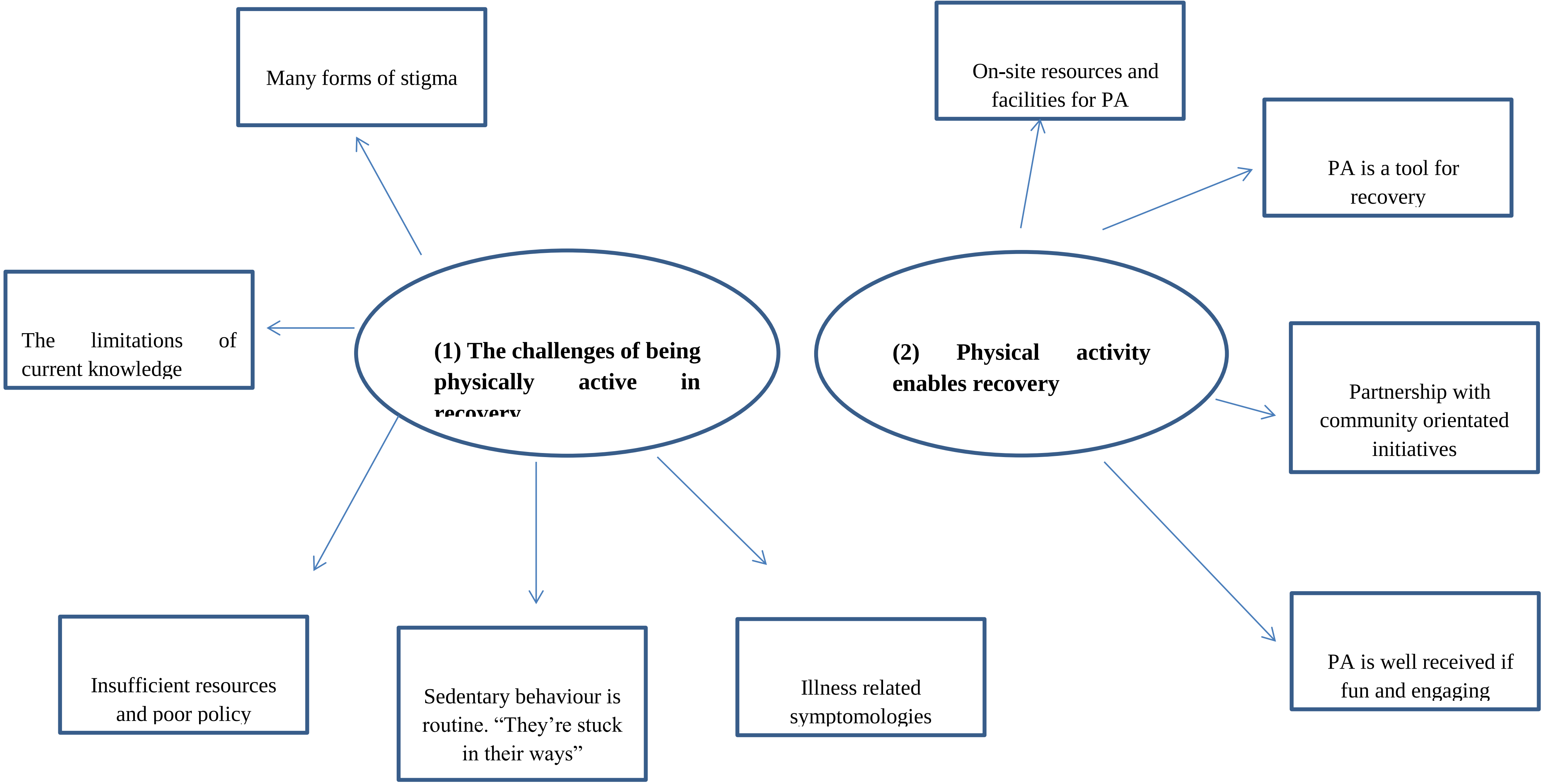
Initially (n=15) took part in the study. However, a service provider participant requested to be withdrawn from analysis post-interview leaving a final sample of (n=14). This sample included six service users, one PSW, one carer, and six service providers, including three MH nurses, prescribing psychiatric doctor, and occupational therapist (OT). A detail description of social demographics within the sample is shown overleaf (Table 5.2).

Table 5-2. Study participants and their role in rehabilitation mental health

Assigned title	Role in MH service	Sex	Time involved with MHS	Age	Participant's perspective on PA/SB Role/Behaviour
Participant 1 (SU)	Service user	Male	20 years	48	Currently not involved in any structured PA Walks for transport
Participant 2 (SU)	Service user	Female	15 years	43	Regular recreational walker, Attends yoga and swimming regularly
Participant 3 (SU)	Service user	Male	2 years	30	Currently not involved in any structured PA Former gym user
Participant 4 (SU)	Service user	Male	NA	64	Currently not involved in any structured PA
Participant 5 (SU)	Service user	Male	NA	NA	Currently not involved in any structured PA Walks for transport.
Participant 6 (SU)	Service user	Female	5 years	59	Wheelchair user who takes daily trips around grounds of hospital unassisted. Attends structured PA twice weekly
Participant 7 (SU/PSW)	Service user (PSW)	Male	7 years	29	Responsible for assisting other service users in engaging in PA
Participant 8 (SP-Nurse)	Service provider (MH Nurse)	Male	4 years	NA	Responsible for referrals to exercise specialist nurse for PA

Participant 9 (SP- Nurse)	Service Provider (MH Nurse)	Female	20 years	NA	Responsible for referrals to OT for PA
Participant 10 (SP-Nurse)	Service provider (MH Nurse/Fit instructor)	Female	25 years (across services)	NA	Responsible for delivery of PA programmes in service
Participant 11 (SP-OT)	Service provider (OT)	Female	30+ years (across services)	NA	Responsible for delivery of PA programmes in service
Participant 12 (SP-Man)	Service provider (Management)	Male	30+ years (across services)	NA	Responsible for referrals to OT for PA Oversight of programmes
Participant 13 (SP-psych)	Service provider (Psychiatric doctor)	Male	5 years (across services)	NA	Responsible for referrals to OT for PA Oversight of programmes
Participant 14 (SP-Carer)	Family member	Female	10 years	NA	Not currently responsible for any
NA= Not available (Where participants have declined to respond)					

Figure 5-1. Thematic map of results



5.4.2 The challenges of being physically active in recovery

The first theme from within the data that were explored here was '*The challenges of being physically active in recovery'*. This salient theme has five subthemes which can be seen below in Table 5-3.

Table 5-3. Summation of Theme 1 and sub-themes

Theme 1	*The challenges of being physically active in recovery*
Sub theme	**Codes**
The many forms of stigma	• Stigma experienced by service users • Latent stigma from those who deliver care • Risk avoidance among MH staff
Sedentary behaviour is routine. "They're stuck in their ways"	• Passivity towards PA • Conflict in changing the status quo
The limitations of current knowledge	• PA viewed as weight management tool
Insufficient provider resources and policy	• Not enough staff to provide PA in addition to usual care • Access and transport as a barrier • The environment and capacity of existing facilities are insufficient
Illness and treatment related symptomology	• Motivation linked with illness • Having poor physical health as a barrier

5.4.2.1 The many forms of stigma

The first subtheme explored here was the issue of stigma, and how it can impede people with a diagnosed SMI from engaging in PA. Initial coding of the data at a semantic level showed that stigma was a concept discussed by a number of service providers in relation to their experience of delivering or facilitating PA for individuals with SMI.

Service users and stigma

A number of the service providers discussed being cognisant of the importance of minimising the 'stigma effect' for service users in their planning of PA programmes. For the participating service providers that discussed this, experience has taught that community-based PA, while objectively a positive endeavour, also increases service users' exposure and risk of experiencing stigma through interactions with people without an understanding of mental illness. Here a service provider participant (OT), who is tasked with delivering PA programmes in her respective service, talks about her experience of trying to minimise stigma for the people she works with through concerted efforts in planning PA outings that take place outside of service facilities:

> *If you go out on mass… you're actually sort of, you're not integrating correctly into the community. You-know, you're not part of the community because you're just this bus load of 20 or 30 people being dropped off. Whereas a group of eight or nine is just… you know, you can just blend in and be part of the community without actually making it obvious* **(Participant 11, SP – OT)**.

In one of the locations where data was collected, exercise equipment had been installed, albeit in an ad-hoc fashion, as service providers working there were attempting to run classes for rehabilitation service users. One participant here speaks of the experience that exercise equipment on-site has. This quote is used here however, as it speaks to the connotation that PA undertaken outside the safety of the mental health facilities elevates the perceptions of stigma.

> *They like the idea that there is a gym but it's not like an outdoor gym where most people might feel self-conscious because, going to a public gym, they think they are being judged and watched. But whereas here, they are with people who know them and people who know their mental health problems who are not judging them because we treat everyone with unconditional regard already* **(Participant 10, SP- Nurse).**

Latent stigma from those who deliver care

While stigma is shown as a priority issue for which service providers involved with promoting PA attempt to minimise, the interviews with service users also explored the issue of stigma but through a different lens. Interpretative analysis of the data with service users alluded to underlying institutional stigma that may act as a barrier to physical activity among some service users. One service user participant discussed how he likes to take evening walks around the grounds of the hospital area in which his residence is located. In the pursuit of this activity, he remarks on how he must seek permission to do so first from the nursing staff.

> *No I do it myself every day. I walk myself every day. I ask… I just say, I say to the girls. If I want to go for a walk, I just ask (names the nurse)… I can go for a walk then when I want then* **(Participant 1, SU).**

This type of institutional stigma, whereby the service user is perceived as, and subsequently assumes a passive role in care did not appear to arise from a place of malice or contempt on the part of the service providers in the current research, but rather ingrained beliefs tied to social norms. One service provider recounts how his perceptions of service users' ability with regard to PA were formed based on the normal day to day routines in rehabilitation mental health care where he works. However, the participant discusses how, in working with a different a rehabilitation team for a brief period of time, he was awakened into a new understanding of the potential people with SMI may have. His experience shows a change in attitude and a reduction in latent stigma

> *I have certainly been educated in the last few years by OTs ... about the actual benefits of it and the ways you can be creative in getting people engaged; silly things like when I worked in the rehab team in **** (Names location in the South of Ireland), we went to an activity centre for the day. I was amazed by the amount of activity. I was amazed to see people do things like climbing walls where I think previously I would have been too cautious about things like this. When they were in that group setting, they really flourished. Since then I have been much more open and receptive to the idea of encouraging people to engage in these programmes* **(Participant 13, SP – Psych).**

Similarly, two quotes here further exemplify the language used among service providers in relation to their belief in the capabilities of service users to be physically active. While both these service providers separately spoke of the demand within services for integrated PA as part of care, their outlook, conveyed though language could serve to inhibit PA development within their services rather than promote it.

> *It's not a very safe place to walk* (referring to grounds of supported residential facility) *if you're no good at walking, which one or two of the mental health patients are not very roadworthy if you want to call it that* **(Participant 7, SU/ PSW).**

> *There used to be swimming, used to be swimming. It used to be organised from here* (relevant day centre) *and* (names a nearby high support residential facility*), but it doesn't happen anymore because, I suppose people* (SUs) *are kinda getting older and they're not able for those kinda big things anymore* **(Participant 8, SP-Nurse)**.

Risk avoidance

While considerable overlap exists here between subthemes *Latent stigma* and *Risk avoidance,* they have been dealt with separately as *Risk avoidance* was interpreted as conscious actions to avoid undesirable consequences be they for the service user or service provider. *Latent stigma* on the other hand, has been interpreted as attitudinal or outlook that serves to compound stigma experienced by service users unbeknownst to the service user and or service provider involved. Risk avoidance was exclusively discussed by service providers in interview, with the exception of the PSW participant, who is deemed to be both service provider and user. Service providers' perceptions of service users' capacity to engage in PA was explored interpretively. Based on the interpretation of the researcher, the reader should note that the perceptions discussed are likely interlinked with policy level factors of influence. It was apparent that some service provider participants held the view that the risks of engaging people with SMI who use services were greater than the benefits reaped from doing so.

> *Because if they fall or if they hurt themselves there's an injury form to be filled up, and there is possible complaints as you can see it's all this policies and procedures that are blocking simple things; it's blocking the fact that someone… What I use is positive risk taking, and it is blocking positive risk taking, a person is only human* **(Participant 7, SU/ PSW).**

Others, such as the participant in the quote below, appear to desire a shift from a risk avoidance culture towards encouragement of PA, particularly among more high-risk service users, who arguably need it most.

> *I suppose we are very mindful of risk in everything that we do. We can't wrap people up in cotton wool either. So for example we have a guy in the acute ward of the DOP, and before that he would have been out and about but while he is there, he is on a one to one special with a nurse and now she is quite concerned about his level of activity* **(Participant 13, SP – Psych).**

5.4.2.2 Sedentary behaviour is routine: "they're stuck in their ways"

Service providers and service users both discussed the normal day to day routines which appear highly sedentary among the high support hostels, day centres and homes of those with SMI who use services. From the sub-theme of '*Sedentary behaviour is routine'*, two codes here showed prominence, these were: *Passivity towards physical activity* and *Conflict in changing the status quo.*

Passivity towards physical activity

Earlier in this analysis the concept of *Latent stigma from those who deliver care* was highlighted through an example of service users having to routinely ask permission to take walks or engage in autonomously motivated PA. While this has been interpreted as '*Stigma'* so far as it has been incorporated into a stigma subtheme, other service users participants have considered this issue to be a two-way street, where service users perpetuate this type of norm through their passive attitude to therapeutic endeavours like PA.

> *I'm just saying that this is the culture that these people have been institutionalised in to. They feel like they have to ask the nursing staff for every little thing. I see it myself; I have seen people come up to the nursing station to ask, "can I go to the shop"? "Can I get an ice cream"? Even though this is their home! The, the kitchen, the fridge is locked away from them, and that kind of stuff. It is the same with physical activity; they don't want to engage in it. There is many I am working with who have been offered a physical eh eh, offered to go out and walk, but they don't want that. They refuse it! But that is until the nurse comes along and says "hey, c'mon, you're doing it for your own health and all this kinda thing, then there is a change in attitude. They certainly won't look for it!* **(Participant 7, SU/PSW).**

MH service provider participants spoke about their experience of passivity in service users towards PA also. Here the mental health nurse describes her experience of collecting service users from high-support residential facilities to attend PA programmes.

> *I will go in and knock on their door and try to encourage them myself and say "hey, I am here if you want to come with me, let's go because the bus is outside". Some of them will come and some of them will not respond. They might say "not today" or whatever. I might go away with one person out of five, or even nobody at all for the day* **(Participant 10, SP- Nurse).**

Passivity towards PA first is demonstrated here in the context of the experiences of service user. In this subsequent quotation a service user participant describes her perception of what normal behaviour routines are like within the high support hostel where she lives.

> *But I think for most people, it's about rousing themselves up, they're on medication, they tend to have a very lack of physical activity, they sit around, have a smoke, have a chat and they stay within the confines of the building you know, nearly. They don't go outside of that for anything else. To awaken people into physical activity is the thing* **(Participant 2, SU).**

The above quotation speaks to the atmosphere and environment within the rehabilitation facility where this service user lives. Such experiences are further contextualised here in the experience of a MH nurse, again showing passivity towards PA and therefore promoting SB. The participant discusses how a peaceful and relaxed environment within the high support hostel where she works is desirable from the perspective of the service providers; physical inactivity is in this instance an unfortunate desirable.

> *You are trying to stimulate them as little as possible, it obviously has an oppositional effect on their weight gain, their health, yep, their general health and fitness.*
>
> Researcher: *When you say, "trying to stimulate them as little as possible", what do you mean?*
>
> Participant: *Or someone with you-know, maybe severe anxiety symptoms or hallucinations ... whatever, someone who is agitated. Obviously, so you are trying to keep things calm and so…* **(Participant 9, SP – Nurse)**

The sentiments of the Participant 2 and 9 were echoed by a number of service provider participants. A number of service provider participants expressed the view that the older service users in rehabilitation services were more prone to this sedentary lifestyle. It was unclear if the sedentary routine was a cause or effect of the passivity towards PA in this instance.

> *So this is something I am definitely aware of especially with the older cohort because a lot of them are institutionalised in their behaviour and their routine really is getting up, getting medication, watching T.V, having lunch, getting more medication, going back and watching T.V and maybe having a nap and the cycle goes like that, day in day out* **(Participant 13, SP – Psych).**

Conflict in changing the status quo

Again, the analysis of data here points to a crossover between the subthemes of '*The many forms of stigma*' and '*Sedentary behaviour is routine*'. Participants in the study discussed conflict in the pursuit of PA promotion. Conflict type scenarios are reported by a number of service providers and service users as the normal experience of service providers trying to engage service user in PA. Here a service user describes attempts by service providers to engage him with PA programmes as akin to nagging, which is heavy with negative connotations.

> Researcher: *Right… and would you be asked by someone to go and get involved in exercise?*
> Participant 3: *Eh… once or twice but they would kinda be like nagging you* **(Participant 3, SU).**

To give a good insight into the meaning of such conflict, Participant 6 who is a PSW, and as such, has experience of being a service user and of being a service provider involved with promoting PA provides unique insights. The participant discussed how service providers often need to circumvent resistance in order to promote physical activity and less sedentary behaviour. In the following quote, the participant goes on to further speculate on the potential of the role of the PSW in this context:

> *It's like …at times I just could not be bothered to exercise and the service users I work with may feel the same; they do feel the same. They don't want anything to do with exercise they just want to be left alone as it were and not be bothered, and you'd get an awful lot of confrontation when you try and get someone who has been institutionalised for 30 odd years and suddenly to be told; "look you need to exercise". There's an awful lot of anger there you know? … I don't see a reason why not peer support could include physical activity once the person has the lived experience of that is as well because that is what is essential* **(Participant 7, SU/PSW).**

In describing their experience of trying to engage service users in PA, two service provider participants likened the relationship between the service provider (discipline non-specific) and service user as one that resembles the relationship between a parent and young child; again this metaphor demonstrating negative feeling and conflict on the discussion topic between stakeholders. In the context of PA promotion, the implication is that the service provider assumes the role of the 'nagging parent' and service user a stubborn child. It seems that this relationship dynamic does not facilitate successful PA promotion.

> *I am also their registered psychiatric nurse, remember? So I have to be a buddy at some point? But I have to be a buddy and make them do unpleasant things as a psychiatric nurse, remember. I have to, I have to eh look after their personal hygiene you-know, things like have a shower and things that are personal and things that are embarrassing for them and whatever. You-know, nobody wants to be told to do all those things. So that's why they don't listen to you, it's like a parent. They don't listen to you when you tell them something. But when someone else says the same thing, they will believe it, "Oh ***** (Nurse's name*) was right, if the physio therapist is saying this, it means we need to get cracking"* **(Participant 10, SP- Nurse)**

5.4.2.3 The limitations of current knowledge

Physical activity viewed as a weight management tool

Almost all service user participants discussed their concern around their personal experience of weight gain during their illness. Weight loss and weight maintenance were perceived as synonymous with the topic of PA promotion and SB reduction among service user participants.

> Researcher: *Why do you say that?*
>
> Participant: *The belly haha…*
>
> Researcher: *So you feel that it's good for losing weight?*
>
> Participant*: I have to do extra walking. I need to eat less and drink less, hmm I don't want to be fat you see* **(Participant 5, SU)**

The concern that service users had in relation to being overweight or having experienced weight gain was evident throughout interviews. A number of the service users discussed how service providers promote PA as a weight mediating activity. Here a service user discusses an Operation Transformation initiative (Modelled on the popular television programme) that he was involved with. The participants discussed the focus of such a programme was centred on weight management.

> *Yeh. They weigh us every week. Then they tot up at the end of the month or every two weeks, how much they have lost, and how much you're after gaining or whatever* **(Participant 3, SU).**

Not surprisingly, the issue of weight management was frequently discussed by service providers in relation to their experience of working with service users. Both service user and service provider participants connect the topic of physical activity promotion as synonymous with the necessitous issue of weight management, which appears to be a priority issue for services. In the following quotation a participant who is a carer, but also facilitates co-production workshops within local services describes her experience of working with groups of individuals with SMI.

> *I co-facilitate workshops and they often express in some way how do I lose weight because some people are on medication after going through mental illness or addiction they're on certain medication the side effects of that medication is weight gain* **(Participant 14, SP- Carer).**

The experiences uncovered in the analysis of data indicate that PA programmes within services have become weight management focused with consequent detriment for recovery focused PA that is sustainable and meaningful.

> *I have been asked recently to help someone to lose a bit of weight, and the focus of it was to lose weight. It wasn't about trying to get them to have a healthier lifestyle. It was all about "we just need someone to bring him down to the swimming pool and let him swim for half an hour, then bring him back up for dinner at 12"* **(Participant 7, SU/PSW).**

5.4.2.4 Insufficient provider resources and policy

Not enough staff to provide PA in addition to usual care

A reoccurring theme throughout interviews with service provider participants was that a lack of resources, and therefore, according to staff, staff shortages within services were ultimately to blame for service users not being sufficiently able to give attention to PA as part of their role in providing care. Here a nurse discusses the necessity to collect service users in a bus, much to her disagreement with the process, rather than accompany them on daily walks between supported facilities and the local day centre.

> *It's not always easy to convince them, unless you get involved with walking with them. You can get involved with walking with them but that is no longer possible because of the staffing shortages; there's nobody to spare to go and get somebody on foot and bring them yeh (to the day centre)? So that's what gets in the way* **(Participant 11, SP – OT).**

Another service provider discussed the limitations that are placed on PA and or exercise programmes where it is perceived that there is not enough staff to run programmes. According to a number of service provider participants, PA programmes do not run when supervision levels are deemed unsuitable, which according to staff, is often.

> *We do group walks, but on a very small scale because of staffing and supervision issues. They can only go locally like, maybe around the block. Really, it's just a few metres around the hospital* **(Participant 10, SP-Nurse).**

The sentiments of these last two participants are elucidated in discussions with participants that are of a management level. It seems MH service policy is explicit and reluctant in placing PA and SB initiatives as supernumerary to other therapeutic endeavours. Participants discussed how PA programmes are the first to be cancelled if staff members from rehabilitation services get re-assigned to replace absent staff in more acute settings.

> *So I think there's restraints on at the moment in the context that physical activity featured highly in our programs and our mind-set, but on certain days it is a*

> *problem as regards releasing staff to actively pursue maybe organised programmes because of constraints on other parts of the service and demands that we might have to redeploy staff from rehab services to acute settings depending on the acuity and that. So, I couldn't say to you 100% that programmes go ahead every week because there are number of factors at play there* **(Participant 12, SP – Man).**

Only one participant (MH service manager) referred to the existence of a policy mandate to include PA into service user care plans and the challenge presented to meet this policy.

> *The client is obviously involved in the compilation of his or her ICP* (Referring to: Individualised Care Plan). *That's obviously, that's a prerequisite from the Mental Health Commission that the client has to be involved in the process. So it's goal setting, its ongoing review and its consumer participation. So, obviously the goals must be realistic ones you must be reviewed in the context of being SMART. So, there's a timescale on it and there is a review. It involves members of the MDT, primary nurse in identifying a suitable programme for that individual. It also, in some cases may require looking for funding under certain circumstances, that we try and source funding within the service to facilitate the person achieving some of those goals. A good example there is that we might try and source some funding for some client to join a local gym maybe on a 3 month trial membership, that we might source a required funding here or part funding for that as well. The Mental Health Commission, which is our governing body, have specific regulations in relation to physical activity and therapeutic interventions. We have to be very serious about it as well…* **(Participant 12, SP – Man).**

Access and transport as a barrier

Many service users discussed their experience of relying on the MH service providers to drive them from their place of residence to PA programmes that are being run by the services or taking place independently in the community. Where service users are pursuing community-based PA, it seemed that it was largely necessary that they self-managed this on account of insufficient resources to assist with 'more recovered' service users. One service user describes how he used to attend a gym but that this eventually ceased as he perceived it too difficult to get regular transport there and back from the High Support Hostel where he resides. While this issue falls within the subtheme of *Transport as a barrier,* this quote also speaks to poor social support and potentially limited staff resources of staff to support an individual to independently pursue PA.

> Researcher: *Yeh, you mentioned gyms, that you used to go and then you said that you stopped. Why did you stop?*
>
> Participant 3: *I used to go with my brother, but he stopped going down now that he is working. He doesn't get that much time off like. He would have to drive as well like* **(Participant 3, SU).**

The environment and capacity of existing facilities are insufficient

Similar to the quote shown in the previous code, service provider participants discussed how the services and existing facilities were largely geared towards meeting the PA needs of the most inactive, oft elderly service user. The consequence of this was that younger, or perhaps more active service user would either engage with PA that was below a level that is suitable for them or else pursue PA independently within the community largely unsupported.

> *There probably isn't many avenues within our services for that but we do point them in the right direction. So some of the younger guys that I can see are so stable and they are out and go to the gym so they are getting more exercise than they would through the rehab programme and that's fair to say* **(Participant 13, SP – Psych).**

From the analysis here it appears that limited resources, combined with the non-prioritising outlook on PA are closely interlinked and thus shape the environment that is sedentary orientated. While in later themes, PA is identified as a recovery tool from the experiences show. In this sub-theme however, it is clear that a disconnect in relation to perceptions of PA as a recovery tool exists. From the analysis, it appears that while participants acknowledge mental health benefits from being physically active, it is largely viewed as a physical health strategy.

> *Mental health is the main priority. I even think there is a bit of resentment there from psychiatric nurses, especially in the rehab and especially in hostels on the fact that they have to also do the physical health needs and the physical health eh*

> *stuff, looking after the weight gain and all this; and I feel that they come under scrutiny because of that, they feel that eh eh they have to put up a front that they are eh I suppose doing something. The reality is that it is just tokenistic. You-know it's just to say "oh yeh, we have this" but it's just for the sake of having it. But really the priority for physical health or physical exercise or any sort of physical activity, it's… it's, it's low down on the list* **(Participant 7, SU/PSW).**

Other participants talked of the variance between staff in relation to the topic. The quality and attention to PA during recovery was largely dependent on the interests of mental health service providers working in local facilities. Some are thought to be very pro-active and others in different facilities are not**.**

> *But the staff; the staff know the benefit. Some of them are more serious about it. Some of them are vague about it. They just treat it in an everyday way you know. Like it's people who go to the gym know why they go there and why they continue. Those who don't go are like "oh I don't know why you bother going to the gym". Because they don't go, so they're not into it. It's not their thing. I think the staff are on that level. Some of them I find do not take it too seriously* **(Participant 10, SP-Nurse).**

5.4.2.5 Illness and treatment related symptomology

In this subtheme the experiences which make it challenging to be physically active that are inherently linked to mental illness, its treatment, and the associated phenomena to both are shown as they were discussed as experiences by participants. Not surprisingly, these phenomena were discussed regularly and often by participants that were service users.

Motivation linked with illness

Ongoing and persistent psychiatric symptoms were discussed by a number of participants as being a barrier to participating in regular PA.

> *Just the depression, you know and that. Like I suffer from that and then you see sometimes I don't be in great form and I wouldn't be in the mood for going out like you-know? But that is only very rarely; most of the time I would be delighted to go like* **(Participant 6, SU).**

Having poor physical health as a barrier

Service users and service providers discussed the experienced complexity from having to provide or engage with PA where the service user also has a physical comorbidity. In this current research, it seems that physical health challenges are compounded by an ageing profile of rehabilitation service users.

> *A lot of them are an older population they are there definitely 60s if not 70s; physical health needs and some of them are extreme, some of them like obviously they've been smoking for God only knows how many years and that bring up problems like COPD and stuff that does not help the situation, so physical his needs is definitely one* **(Participant 7, SU/PSW).**

5.4.3 Physical activity enables recovery

The second overarching theme that was found in the data relates to the role that PA has in an individuals' recovery journey. Again, deductive and inductive analysis has brought about a series of subthemes which are constructed with codes which are described herein with quotations from the data.

Table 5-4. Summation of Theme 2 and sub-themes

Theme 2	*Physical activity enables recovery.*
Sub theme	**Codes**
PA is a tool for recovery	• PA is a therapeutic resource befitting a recovery approach • Service user demand for PA
On-site resources and facilities for PA	• Introduced to PA equipment in safe environment
Partnership with community orientated initiatives	• Capabilities beyond what the services can provide
PA is well received if fun, engaging and achievable	• Low intensity and walking are preferred

5.4.3.1 Physical activity is a tool for recovery

This sub-theme was discussed extensively by service user and service provider participants alike on account experience of improved physical health and mental health. In addition, both discussed PA in relation to boosting self-worth and exploring meaning and improving wellbeing which has been interpreted here as speaking to both recovery in the clinical and journey sense.

Physical activity is a therapeutic resource befitting a recovery approach

Aside from the already discussed inseparability of PA and weight management phenomena discussed by both service user and service provider participants, service provider participants discussed the potential benefits that service user participants could attain from increasing their PA levels and reducing their SB. This code has been subsumed into this sub-theme on account of its fitting with recovery in the clinical sense.

> *There is an awful lot of weight gain and cardiac problems. So if we did kinda recommend exercise a bit more …. Eh we could kinda combat that stuff you know?* **(Participant 8, SP – Nurse).**

With the exception of weight management, one of the most widely discussed experiences of PA among service user participants was of the therapeutic effect that PA had had for them in relation to both their mental and physical health. Interestingly, service users that discussed this experience also discussed interconnectedness between mind and body which has been interpreted as speaking to a holistic recovery journey.

> *Because it makes me feel better in my mind and my body like, you-know? It helps me a lot like you-know? I think everyone should have some kind of facilities to do exercise you-know? When you're in here (*referring to high support hostel where participant resides*), you're kind of confined you-know; staring at the walls sometimes you-know? And then if it's raining you can't even get out* **(Participant 6, SU).**

PA was discussed in the metaphysical sense as something that represents the body overcoming mind, specifically the ill mind. Here a service user participant discusses her experience the benefits of PA that she experiences in addition to belief in a biologically underpinned process.

> *Everything! It's mind body and soul. It is, it's for every part. Because exercise releases chemicals in the brain that are antidepressive, eh happy chemicals do-you-know-what-I-mean? And you feel great when you have gotten up and done something do-you-know-what-I-mean* **(Participant 2, SU).**

The experience of PA as beneficial to a broad wellbeing associated with recovery was also discussed by non-service user participants. A quote here from a carer shows how she believes the benefit of PA is tied directly to social interactions between individuals during PA; that these social connections are a cornerstone of a recovery journey.

> *It gives a sense of ... sense of belonging and well-being; they also say physical is good for your health it's good for your body and it's, it's a sense of purpose and belonging for people. It's a social activity as well and it's good for your own well-being to get out, and there's a lot of things physical activities like these can offer to people, do you know what I mean, and once you start doing it if you have people going with you, ... everyone wants to feel a sense of belonging in society and when you're going through a challenge of your own you can be around other people that you have in common, you can actually become more confident in yourself because we share that kind of experience with other people in the group, and maybe a walking group* **(Participant 14 – Carer).**

These connections appear to also open clinically therapeutic pathways. In this example an OT reflected on their experiences of how PA has afforded here opportunities to engage service users in quasi therapeutic interventions as a result of social connection made through PA. She discusses the effectiveness of the informality of PA, to which many people with SMI may respond well.

> *They're not having that "how is it going today"? But the chances are they open up a lot more to you when they are out walking than actually if you were sitting across a desk talking to them in a formal basis* **(Participant 11, SP – OT).**

Service user demand for PA

The sentiments of participants expressed in Theme 1, whereby participants demonstrated exacerbation at insufficient resources and policy in relation to PA and SB speaks also to what has been an interpreted demand for more integrated PA and SB within rehabilitation MH services. As such there is overlap again between the two overarching themes of this study. In the subsequent quote, a service user participants that is regularly active, but with significant mobility requirements demonstrates her experience of being confined to SB as a consequence of insufficient support to become active; in her opinion.

> *Even if I had someone on the ward that could show me eh, even what to do or what exercises I can do like… you-know; something like that* **(Participant 6, SU).**

5.4.3.2 On-site resources and facilities for physical activity

One day centre where data were collected has exercise equipment within it where structured exercise programmes are delivered to service users that attend the day centre. In this location, much of the work to develop this day centre and incorporate PA has been done by the nurse on site. In interview, this participant describes her experience of delivering exercise classes within the familiar setting of the day centre. This participant talked of taking inactive participants that attend the day centre and gradually introducing them to an alien environment of weights and exercise equipment. In her experiences, the introduction to this type of 'exercise environment' is a necessary first step if people with SMI are to succeed in attending community-based PA facilities. In the second quote (below), the nurse participant, who has pursued qualifications in fitness instruction (exception to the norm), discusses her experience of the benefits of people with SMI commencing their PA journey within the safety of the mental health facility under supervision from a professional with both psychiatric and exercise knowledge.

> *They probably do that, and this actually helps to ease them into an outside gym or community gyms because it is like a slow transition and eh they don't feel intimidated, they come here, they get acquainted in how to use the few machine that we have which are the same as the ones they have in the gym outside.* **(Participant 10, SP-Nurse).**

> *It's not like an outside gym where you go and the instructor doesn't know what your mental health is like. They are only looking at your goals, your physical goals that you came in with. Whereas some of the mainstream gyms where you go there, if you don't have a good instructor or gym instructors, they might leave you to your own devices once they have done the induction and shown you how to use all the equipment. You are still on your own* **(Participant 10, SP-Nurse).**

While outside of the normal structure of services, the benefit of having an integrated exercise specialist in this sense, were multifactorial as described by the participant. For instance, while physiotherapists are not members of the integrated multidisciplinary MH teams in Ireland, service users that are attending outpatient physiotherapy are afforded additional opportunities for through care with the exercise specialist nurse.

> *Yeh! So I do work with physiotherapists but they are not in the services, obviously they are in the other service in the general hospital but eh… they have only heard of me (nurse with fitness qualification) because the client goes there and tells them that (names participant nurse) has, you-know; she's an instructor now, she has a gym in the (names day centre) and I have been doing some work with her. So then the physiotherapist would get excited and say; "Oh brilliant!"* **(Participant 10, SP-Nurse).**

Despite the evident positive experience arising from this stand-alone role, the relevant participant still spoke of competing interests between priority nursing duties and developed duties as an exercise practitioner, with resulting limitations on the latter.

5.4.3.3 Partnership with community orientated initiatives

While physiotherapists and other exercise specialists are not part of multidisciplinary MH teams, one participant discussed how she manages to seek physiotherapy through her weekly visits to activities run by the Irish Wheel Chair Association, which she was linked to by nursing staff within the hostel where she resides. This access to physiotherapy is perceived by the participant as vital in keeping physically active considering the additional challenge she faces in being active.

> *They're really brilliant to me, out on their own like. Today we had the physiotherapist and he was teaching us all different things to do and... you-know, teaching us to move our shoulders and you-know... saying Breath! I don't be breathing right at all. I do enjoys it like and he's great fun* **(Participant 6, SU).**

Both service providers that are in a position of management (Participant 12 and 13), shared the opinion that the existing rehabilitation services could only support participants to a point in their pursuit of PA and that beyond this point service user must rely on community-based PA where possible. It was not clear from the interviews if this phenomenon was due to deficits in the knowledge of existing staff, deficits in resources, or simply the preferred pathway for promoting PA and reducing SB.

> *So the younger guys wanting to do more stuff; there probably isn't many avenues within our services for that but they're given education and we point them in the right direction. So some of the younger guys; like I don't see them so much because they are so stable, and they are out and go to the gym so they are getting more exercise than they would through the rehab programme and their needs wouldn't be met with us and that's fair to say* **(Participant 13, SP – Psych).**

> *I think the knowledge that there are external agencies out there undertaking programmes probably eases the difficulty in arranging that. Because if we know that there are certain programmes running through, let's take the local Sport Partnership, it might be easier for us to piggyback on those, rather than trying to set up our own individual programmes on campus ...* **(Participant 12, SP – Man).**

5.4.3.4 Physical activity is well received if fun engaging and achievable

The last sub theme explored through TA again bled across sub themes within the salient theme of *Physical activity enables recovery.* Through the photo-elicitation exercise, all service user participants reflected positively on the photograph showing group walking. It was apparent that this was a type of physical activity that was perceived as comfortable and suitable for participants that spanned the PA level spectrum in their description. This point is particularly important, as 'taking the first step' was described by some as the most challenging aspect of being physically active

> *They don't go outside of that for anything else. To awaken people into physical activity is the thing. To awaken them into, look, if you go for a walk you're going to feel better, if you go for a swim, you're going to feel better. The more you do, the more you can do do-you-know-what-I-mean?* **(Participant 2, SU).**

Making PA easily achievable was perceived to be fundamental for engaging people with SMI in PA. Reflecting on the positive effect on-site exercise equipment has on service user behaviours, the participating psychiatric doctor describes a vision for more integrated exercise resources for service uses for whom he cares

> *I think if thing are convenient people are more likely to engage with it just because it's there like so I think we should have a gym on the grounds really and we could cater to all levels of needs because if it was just a walk over to another building, people are much more likely to do that than to go out on a day like today raining to get on a bus in winter and I think most people are like that if you have things in your back garden it is more convenient and you are more likely to engage with it* **(Participant 13, SP – Psych).**

5.5 Discussion

In some international contexts, PA policy and practice is more progressed than others, as exemplified with the comparison drawn between Australia and Ireland discussed in Chapter 2, Section 2.4.3. In Ireland, MH services are held to standards by the Mental Health Commission (MHC) in relation to providing regular PA opportunities to service users as part of their therapeutic care, under the guise of recreational therapeutic opportunity (MHC, 2018). At the same time, National MH services in Ireland have been slow to issue policy level structures and guidance around delivering PA as part of routine care for recovery focused service provision. One of these deficits is the current lack of integrated exercise professionals within multidisciplinary MH teams in community, rehabilitation and acute services (Matthews, Cowman, & Denieffe, 2018). Such policy and community level issues present a unique context on which the role of PA within existing mental health services, where PA is not forthcoming within policy, may be explored.

Study 2 presents data on the experiences of SB and PA (structured and unstructured) from (N=14) key stakeholders in outpatient rehabilitation mental health services in Ireland, including service users, a PSW, family carer, psychiatric doctor, OT, an Area Manager and Mental health nurses. The inclusion of these key stakeholders is relevant for two reasons. First, anecdotal evidence and earlier observation work, has elucidated that the policy vacuum for PA in an Irish treatment context (Prior to data collection and the *Let's get active document*) has resulted in many differing MH service provider disciplines overseeing and implementing PA across locations within the SECH region. Second, while these professions may have an influential role in this regard, only mental health nurses are well represented in qualitative literature on PA for SMI (Happell, Scott, Platania-phung, et al., 2012; Leutwyler et al., 2012). Other disciplines within the multidisciplinary MH team are poorly represented throughout the qualitative literature, appearing largely in quantitative research (Way et al., 2018). And furthermore, disciplines, such as PSW and carers are being increasingly recognised as having a role in implementing lifestyle related interventions in mental health settings (Happell et al., 2016; Stubbs, Williams, Shannon, et al., 2016). Such recognition is aligned with recovery orientated practice (Higgins, 2008).

The findings of this current research show that two overarching themes were identified through the analysis. These were 1. *The challenges of being physically active in recover.* 2. *Physical activity enables recovery.* In dealing with the first theme, a number of sub themes were also identified which will be discussed in the context of other relevant literature below.

The issue of stigma has arisen in many qualitative studies presenting a mixture of community-based and inpatient contexts of people with SMI previously (Gorczynski et al., 2013; Roberts & Bailey, 2013). In these studies, however, stigma is explicitly explored in the context of the beliefs of people with SMI in relation to other peoples' perception of them, which is broadly referred to as meta-perceptions. Meta-perceptions in this regard are subject to bias and symptomology such as anxiety and paranoia (Soundy et al., 2014). In the current research, no service user explicitly discussed stigma being a limitation on their ability to be physically active. Service provider participants were shown to be cognisant of the meta-perception's phenomena. In this instance, the awareness of MH services providers tasked with delivering PA around meta-perceptions of stigma may be a contributing factor in managing this challenge. Additionally, service provider participants demonstrated that PA performed within the confines of the MH facility or within a specific group per se provided a safe space from which people with SMI can become active.

This concept of feeling safe has been documented in studies providing community-based PA for MH populations (Raine et al., 2002). These factors combined show that service providers in this study were attuned to these stigmas related meta-perceptions experienced by people with SMI. It is possible that counter measures implemented by service providers to address these issues are resulting in a reduced stigma burden among the current research sample. For example, in the research findings, an OT describes how she uses small walking groups for doing PA in local community-areas, as to go walking with a large group has socially abnormal connotations. The phenomena discussed here, which includes the potential for stigma and the safe space to exercise away from stigma is a good example of the interconnectedness of intrapersonal, interpersonal and environmental levels within a SEM.

Despite this promising prospect of a low level of experienced stigma among service users discussed above, the analysis of this research also inductively explored the concept of stigma as it was found in the experiences of service users through unintentional behaviours and attitudes of some service providers akin to social norms among service providers. The quoted example showed an individual who was required to request permission to take his evening walk. Previous research has shown MH service providers to be divided on the issue of ‘setting rules’ that positively influence health behaviour in relation to junk food, at the cost of limiting autonomy for service users (Faulkner et al., 2009). A recent online survey using quantitative thematic analysis positioned in a realist paradigm of MH service providers in Australia and New Zealand, did not identify stigma as a barrier to PA for people with SMI (Way et al., 2018). The authors postulated that service providers overestimate the magnitude of barriers to PA experienced by people with SMI. This, they argue, drives a self-fulfilling prophesy effect of the barrier. Put simply, where service providers have an expectation of service users to not be physically active, this in-turn is met by passivity by service user towards PA and thus, non-engagement. The current study adds contextualisation to this phenomenon through the experiences shown by service users seeking permission to be active and staff approaching PA promotion in a manner that was describes as between that of parent and child. These issues speak of an experience of culture within services in relation to PA and its place in recovery. Other research has documented this paradox where PA is advocated for at a surface level, but restricted on account of deeper cultural and social norms under the tenets of safety and risk avoidance (Faulkner et al., 2009; Gorczynski et al., 2013). While this issue is complex, the issues that surround such stigma appear largely rooted in attitudes and as such are potentially modifiable.

Service provider participants, including management discussed the ongoing and regular re-designating rehabilitation staff to more acute settings, as part of wider service level ‘staff shortages’. While this practice has an objective rationale, it raises significant questions about long term sustainability. For instance, higher PA levels correlate significantly with fewer acute admissions to inpatient care for people with (Korge and Nunan, 2018). It is postulated that practice feeds into a wider negative cycle of poor therapeutic opportunities leading to greater amounts illness acuity. The presence of an overarching policy which mandates for the inclusion of PA and exercise in the care plan of individuals with SMI was raised by only one participant, who was at a management level of service provision. The policy referred to here is (MHC, 2018). Interestingly, no other service provider or service user participants made reference to policy of this nature or to wider Healthy Ireland strategy. At the time of data collection the national MH services in Ireland produced guidance for service providers in effecting behaviour change (Broderick & Moran, 2018). With the time frame considered, it is unclear if these guidelines have influenced behaviours and practices among stakeholders in the interim. To date the literature indicates policy level correlates weakly associated with PA levels at best (Vancampfort, Correll, et al., 2013; Vancampfort, Knapen, et al., 2012).

The sub-theme of *Sedentary behaviour is routine* has contained within it two codes that, when considered at a semantic level sit somewhat juxtaposed to one another. These were *Passivity towards physical activity* and *Conflict in changing the status quo.* However, a contextual understanding may be provided by quotations that demonstrate the interplay that exists between these two codes. First, passivity among service users as perceived by service providers again may be linked with a self-fulfilling prophesy. Service providers are documented as having low expectations on PA of people with SMI in the literature (Leutwyler et al., 2012). Again this sub-theme speaks to a culture and climate within services which should be explicitly addressed, opting for a PA promotive environment regardless of the PA levels of service users (Hargreaves et al., 2017). While passivity towards PA has been described as a prevailing climate within facilities where data were collected, it seems that conflict may also arise when efforts are made to engage some service users in PA programmes. The experiences shown in the findings elucidate that this conflict arises from trying to "awaken people to PA" as it is phrased by one service user participant. It would appear that while PA and SB reduction are considered important, the resourcing and capacity of services to deliver regular and tailored PA is limited, replaced by ad-hoc and all-encompassing programmes. This, combined with limited training on PA, may create conflict in engaging service users in PA. Mental health service providers are typically the predominant social support for people with SMI during PA (Soundy et al., 2014). As such, service providers must recognise the presence of low PA autonomy and self-efficacy that may be present. Additionally, service providers should be mindful of educational approaches used to engage service user in PA. For instance, weight loss may not be an effective strategy on which PA should be promoted, but rather, a focus on the role of PA in recovery from SMI.

Weight gain and obesity are common among people with SMI (De Hert et al., 2011; Nash et al., 2015). Exorbitant weight gain is multifactorial, but appears to be significantly affected by psychotropic medication, particularly antipsychotic medication in many cases (Vancampfort et al., 2019). A strong consensus in the literature now exists that shows PA intervention in isolation has limited effect on measures of weight gain for people with SMI (Vancampfort, Rosenbaum, Schuch, Ward, Richards, et al., 2016; Vancampfort, Rosenbaum, Ward, & Stubbs, 2015). The current research findings here show that service providers and service users consider PA and exercise as synonymous with the concept of weight loss, and as such has been interpreted as an exasperating experience of unachieved goals and ‘nagging’ from service providers. Weight-loss was explored as a key motive for engaging in PA, which appeared to outweigh other experiences of being physically active. Service users from the current research spoke of their desire to be more active in the context of health anxiety which stemmed from service provider input and encouragement to offset weight gain. In addition, service provider participants discussed their concerns regarding the weight gain among those for whom they care. Service providers frequently discussed weight control throughout interviews in the context of a need for integrated PA as part of care. Within the literature, qualitative research has documented confusion among service providers in their discussions with service users on the complex issue of weight gain and weight loss during illness and while taking antipsychotics (Soundy et al., 2007). Further to this, qualitative research from Rastad, Martin and Åsenlof (2014) show that people with SZ report slow and no changes in weight loss as a barrier to PA. Their exploratory research links this barrier to previous experiences of no-effect through PA and exercise. While this phenomenon was not explicitly discussed by participants in the current research, it could be postulated that this phenomena is contributing to the conflict already discussed. These findings combined, support the need for education development of existing MH service providers to enhance their skills to engage and inform service users on PA and exercise.

Physical activity interventions can reduce the severity of some psychiatric symptoms in some diagnoses groups (Firth et al., 2015; Schuch et al., 2016). While this evidence is clinically significant, it does not describe psychological descriptions of the individual level processes and the meaning that these have in the journey of recovery. For instance, one participant in this current research, an OT, indicated her experience of how PA allowed for enhanced communication and therapeutic conversations between service user and service provider. A previous study that used focus groups with MH service providers in the UK found this concept to be an overarching theme throughout their research (Leyland et al., 2018).

A small body of phenomenological research on the experiences of PA for people with SMI have previously represented this experience. For example one study with people with BPD describes PA programmes as a structuring habit on which other activities and interactions can be built (Wright et al., 2012). In the current research, a number of service user participants held the opinion that PA is enmeshed within their own personal recovery journey, a finding that was also represented in the experiences of some providers. Taking part in PA was described as a mediator of social connection on which a sense of belonging can be built. This concept has been previously postulated in structured exercise for people with SMI (Pickard et al., 2017). In a separate phenomenological study, social support was described as a facilitator of PA in non-intervention PA for people with SMI but the concept of social connection and a sense of belonging was not discussed in the same way (Hargreaves et al., 2017). The current findings add weight to this assertion.

Two service provider participants holding management positions discussed that a number of service users within rehabilitation services are active under their own volition by engaging with community-based PA resources where their needs have surpassed the capacity of rehabilitation services to provide appropriate PA. The current research shows that some rehabilitation teams within the catchment of this study are subsidising gym memberships for some of these more ‘stable’ service users that want to pursue PA outside of the provided. There are promising and concerning implications as a consequence of this. First, in the context of successful PA interventions, a number of interventions that have successfully increased PA as a primary outcome have done so through community-based Interventions (Ashdown-Franks et al., 2018). Similarly, bridging treatment to the community where possible is in line with current best practice for MH care generally (Department of Health and Children, 2006). That being said, worrying connotations were inferred through the data gathered in the current research, that essentially these more ‘stable’ individuals essentially are lost to regular staff follow-ups in relation to PA pursued autonomously in community settings, this is a particular concern within the findings.

Review research has consistently shown that people with SMI look to service providers as their primary point of social support in sustaining PA programmes (Gross et al., 2015). Additionally, earlier findings from Study 1(A), and also in Matthews *et al.*, (2018), show that individuals with SMI that have higher PA levels, also report stronger barriers to PA in the domain area of social influence. The current findings of this qualitative research (Study 2) may help to contextualise this seemingly paradoxical phenomenon within an Irish setting. Research that has adopted similar methodological approaches to the current research, taking a phenomenologically informed exploration of PA during mental illness, showed that social support from a professional was imperative to maintain PA in a community setting, described as an adjustment of body-world connection (Hargreaves et al., 2017). Such a reliance on social support likely relates to the need for a feeling of safety whilst participating in PA (Mason & Holt, 2012; Raine et al., 2002). While community-based PA programmes align with recovery focused service provision, questions arise in relation to their capacity to provide support structures to maintain the engagement of people with SMI. Or, as this research suggests, MH services lack the capacity and or knowledge to continue to provide adequate support in the form of through-care for service users engaged in community-based PA. While the exact long-term implications of this occurrence are not explored in this study, at a minimum, this lack of through-care has the potential to be a waste of resources where resourcing could be re-directed to bring Irish services in line with international counterparts and EPA guidance on integrated PA (Matthews, Cowman, & Denieffe, 2018; Stubbs et al., 2018). More concerning is perhaps the implication for persons with SMI that are not adequately supported in pursuing community-based PA. While speculative, research has previously captured the experiences of persons with SMI engaged in unsupported community-based PA show that it can be deleterious to mental health (Soundy et al., 2007).

The burgeoning use of qualitative research in fields related to exercise science has opened debate regarding frequent misunderstandings of its aim and place within the field (Smith, 2018). In the current study, a small sample size is included in the current study. However, a diverse sample has provided rich and nuanced data that are unique to the literature with respect to content and approach. While phenomenological research of a similar nature has been carried out with some SMI diagnoses previously, there is poor representation of a number of key stakeholders, namely carers, OT, psychiatric doctors, management and PSW. There are a number of issues that must be considered in understanding the findings. First, the participants that engaged in the interviews, for the most part are likely individuals that place a value on PA, exercise and reducing SB for their own health or the health of others. It is also notable that in the current study, and in fulfilment of the wider EBCD approach, the researcher spent time within each service where data was collected. This was done so that the researcher would have an understanding of existing programmes, resources and structures in the context of PA provision that exists between the two settings where the population were located, as advocated for in phenomenologically positioned research.

In the context of this overall EBCD research, the findings of this study carry forward into the co-design in two ways. First, the themes and subthemes discussed in the results of this chapter are carried forward and used during the second co-design session of Study 3 (details shown Chapter 3, 3.8.3.3). In addition to this, both service user and service provider interviews were subject to a more semantic TA to identify 'touchpoints', which are defined experience shaping moments (method and relevant touchpoints outlined in Chapter 3, 3.3.8; Bate and Robert, 2006). Together, these data are '*Gathered experiences'* as per the EBCD process. These data have been used to directly focus the co-design work to identify and develop solutions to enhance service delivery in Study 3.

5.5.1 Study limitations

People with SMI frequently have challenges in relation to communication, which for some is allied to cognitive deficiencies and psychiatric symptomology (O'Carroll, 2000). In the current research study, considerable variance in the volume of content and length of time in interviews were shown across interviews with service user participants. Moreover, there was a notable discrepancy observed between volume of content discussed between service user participants and service provider participants.

Undoubtedly, the quality of content improved as the researcher developed interviewing skills, and as themes and subthemes were formed (discussed further within this Section). Nonetheless, such variance is not unique to this research. Other qualitative research carried out with SMI populations on this topic have seen similar variance in interviews (between 7 and 20 minute long interviews) on account of vocabulary, disorganised speech and anxiety among interviewees (Hodgson et al., 2011).

A number of measures to overcome this communication barrier for some participants were adopted in this current research. For instance, photo-elicitation (Glaw et al., 2017), and close observation (van Manen, 1997) were utilised in Study 2. What is more, the researcher attended training in creative interviewing skills (Dublin City University, 2017) which allowed for the development of skills in relation to using techniques such as photo-elicitation prior to commencement of the Study 2. Based on reflexivity (see 5.3.8), the researcher was explicit with each participant about being an outside researcher with an interest in the PA behaviours of people who are in their MH services. These points will have undoubtedly influenced the nature and direction of discussion between service users and service providers with the researcher.

In keeping with a predetermined EBCD approach, data collection was carried out with service user participants first and service provider interviews were carried out subsequently. There is likely to be growth of experience in the researchers interviewing technique throughout the interviewing stages of data collection. This growth is also accompanied by an increased understanding of nuanced themes and sub themes which are developing during the process and are therefore being probed for better clarity and understanding. Consequentially, some themes could have been explored in greater depth by the researcher during the course of early interviews with service users. This last point, combined with the inherent challenges of interviewing persons with SMI, likely contributed to a less rich data set among service user participants. In addition, the resistance to broach discussion on PA (alluded to during analysis sub theme of conflict) may also play a role in limiting the volume of content discussed by some service user participants and must also be considered in these findings. To mitigate some of the limitations, a final interview was conducted with a service user (PSW) after interviews with service providers had been completed to explore more developed themes with a service user participant to ensure that the voice of service users were appropriately represented at all stages.

5.6 Conclusion

This study provides an in-depth account of the experiences of key stakeholders that take part in and facilitate PA as part of the rehabilitation and recovery service provision. In exploring these experiences of PA and factors that influence PA across social ecological domains, a picture of the challenges to being physically active in recovery is explored. In addition to this, the second salient theme explored how PA enables a recovery state for people with SMI.

To the researcher’s knowledge, this is the first qualitative research study on PA and SMI that has taken interpretivist phenomenological inquiry on multi-stakeholder transdiagnostic inquiry. The findings here provide exploratory and descriptive experiences of PA as it is provided during care. Such information can provide useful insight for future programme development. In this current research, challenges with being physically active while in rehabilitation and recovery are discussed. These should be considered in future programme development going forward with a view to making PA programme more sustainable. This research also explores experiences that relate to how PA may enable recovery. It is argued that future intervention should emphasise such phenomena in future goals and outcomes, rather than focusing on more traditional measures like weight gain. In addition to the contribution that these findings make as stand-alone research, these findings are also fundamental to the trajectory and success of the co-design process in Study 3, which aims to develop the MWRP. The depth of inquiry in Study 2 ensures that the MWRP, which seeks to provide a PA and SB resource for recovery focused service provision is grounded in deep-multi-stakeholder experiences of

PA and SB as it exists in services. These experiences are fundamental to understanding and shaping the future of PA as part of service provision for the future.

Chapter 6

Experience-based Co-designing the *Move with Recovery Programme*

Chapter 6: Co-designing the Move with Recovery Programme

Study 3

6.0 Section introduction

Irish MH services have previously come in for criticism for lacking comprehensive PA policy. Now Irish MH services have developed an education and information resource document for MH service providers to engage service users with behaviour change techniques on PA and SB. The *Let's Get Active* resource guides service providers with information on the benefits of PA and SB reduction and provides them with communication strategies to overcome barriers to PA. The resource was developed in 2018, and was recently launched in August 2019 (Broderick & Moran, 2018). Some concerns have been expressed about the *Let's Get Active* resource relating specifically to the lack of service user centeredness and service user inclusion during the programme development (Chapter 2, Section 2.4.2). Nonetheless, the resource provides a toolkit from which MH service providers may draw upon in implementing behaviour change with individual service users (Broderick & Moran, 2018).

There is uncertainty regarding the pathways and opportunities that MH service providers can utilise to engage service users in PA programmes that are suited to their needs and that are sustainable long-term. This uncertainty is the product of the aforementioned translational gap between PA interventions and PA in clinical practice (Deenik et al., 2019). This research project has set out to address this gap in practice by adopting a specific service development approach which has been successfully utilised for service level improvements and development in MH settings (See table 2.6 for previous use of EBCD in MH setting). This chapter briefly outlines the traditional EBCD process and its philosophical origins, drawing from the literature already discussed in Chapter 2, Section 3. In addition, this chapter outlines the outcomes from the current research, specifically Study 3 (Co-design). This is the culmination of a modified EBCD used to develop a PA and SB programme within existing MH services in a manner that is in keeping with the current recovery orientated care. The detailed methods of this co-design are shown in Chapter 3 Section 3.8, where the multistage process that draws from Study 1 and Study 2 is outlined. Within this chapter, the outcomes of this process, in addition to a description of the evaluation of the co-design process is also outlined. Lastly, this chapter provides a discussion on the EBCD process used and the subsequent evaluation work of the EBCD process.

6.1 Background on EBCD

In Chapter 2, Section 3, literature is discussed which outlines the origins of EBCD approach and the philosophical roots which have shaped this approach. Experience-based Co-design is a health service development approach that makes service users central to the process (Robert, 2013). Since its conceptualisation, EBCD has proliferated health research in the context of service improvement (Donetto, Tsianakas and Robert, 2014), including its modification and use within MH settings.

6.1.1 Experience-based Co-design and service user centred care

Experience-based Co-design harnesses raw experience where possible, and redirects these experiences to act as a catalyst for co-design work to improve the way services provide care (The Point of Care Foundation, 2013; Robert, 2013). The PAR approach which directly influences EBCD (Roberts & Bailey, 2013), has central tenets which shape its influence. These tenets are the collective commitment to address a problem, a joint desire to engage in reflection, a joint desire to engage in collective action, and the development of a researcher and participant alliance (McIntyre, 2008). These tenets are congruent with contemporary healthcare movements of patient/public involvement (previously discussed in Section 2.6.1) (Foot et al., 2014; Staley, 2009). Such health care movements have seen a dilution of approaches that claim to put the service user at the centre of care, research, and practice processes. Phenomena such as co-production, co-delivery and co-design, to name but a few, are used widely and interchangeably with often considerable variance in the extent of service user involvement (Palmer et al., 2018)

In addition to the above, these tenets which shape EBCD methods are also directly aligned with key principles of recovery focused MH care, which underpin service delivery in Irish MH services. This approach to service delivery, initially outlined in *A Vision for Change,* advocated for a number of sweeping changes in MH services structure. For example, recovery orientated services should adopt an approach to care that reflects the following values: Multidisciplinary teams working together; The recovery journey should be operationalised in care planning; The practical service users' needs should be addressed; Services ought to be delivered in a community setting where possible and service users should take an active role in their own care (Department of Health and Children, 2006). After the publication of AVFC and the subsequent discourse of the challenges for translation of its recommendations, the HSE developed a national framework document in 2018 to support a move towards recovery orientated care for local MH services. Outlined in this document are a number of key principles which services should endeavour to incorporate into all aspects of care. These are: i. the centrality of experience; ii. Co-production of recovery services; iii. An organisational commitment to development of recovery orientated services; and iv. Supporting recovery orientated learning across stakeholder representations (Health Service Executive, 2018). Reflecting on these points, EBCD seems a fitting approach to develop PA programmes for the future of Irish MH care.

6.1.2 Co-design of physical activity programmes

As already outlined in Chapter 3, the concept of applying an EBCD approach to develop a PA programme for people with mental disorders was first conceptualised within the scope of this current research and documented during initial stages of project development (Matthews et al., 2017). However, there are some examples within the literature where "user centric", "co-design" or "participatory" design has been used in the development of PA programmes for people with SMI. These approaches and methods are relatable to EBCD, but ultimately, methodologically different. In one study, Graham *et al.* (2014), used focus groups with 37 service users in a grounded theory process to establish priority areas for behaviour change interventions based on the participants with SMI (Graham et al., 2014). While this approach was effective in designing an intervention that was well received by MH service users, a key point is worth noting on the approach taken. The service user centric approach is unique in many regards; yet, the absence of other key stakeholders, specifically MH service users, in the design process raises questions of balance and sustainability of process outcomes from this development work. This also raises questions regarding the success of programme implementation in the absence of this buy-in from all stakeholders that are involved with programme rollout. Such multi-stakeholder approaches to co-design work seem necessary.

In similar research from the USA, 'participatory research method' were utilised to develop a community-based PA programme using service user focus groups (Hoffmann et al., 2015). However it seems that in Hoffmann *et al.* (2015), an atheoretical position of the research process may have limited the capacity of the PA programme that was designed. In this research, the authors advocate that a SEM may be suitable theoretical model to incorporate going forward to effectively develop such community-based programmes in the future. This would allow for the consideration of multilayer influences on PA. Another study carried out by Wheeler *et al*. (2018), has applied a 'co-design' approach to address poor PA levels of people with mental disorders. Wheeler *et al.* (2018) used a two-stage co-design approach with MH exercise practitioners and MH service users. The study also used focus groups to identify barriers to PA, and subsequently carried out co-design to identify strategies which MH services can use to overcome these barriers, thereby providing a list of service recommendations (Wheeler et al., 2018). However, the two-stage co-design process outlined in Wheeler *et al.* (2018) is far removed from a traditional six-stage EBCD approach in its methodology. The traditional EBCD approach can be found in Chapter 2. There are stark differences including, but not exclusively, the use of trigger films, multidisciplinary inclusion, and design theory methods such as prototyping. In the case of Wheeler *et al.* (2018), no evaluation work has been carried out to date, leaving questions with regard to the acceptability and feasibility of the unique co-design process. In addition to these studies, there is widespread literature available to show various modifications to EBCD. Further discussion on this is found in Section 3, Chapter 2.

The broad EBCD approach and modifications that were implemented in this research, in addition to the exact methods undertaken for Studies 1 (A), Study 1 (B), Study 2, and this Study 3, are discussed in detail in Chapter 3. This EBCD approach brought about the development of a PA and SB resource, called the MWRP (See Appendix 21 for the MWRP). This chapter provides an outline of the final stage of an iterative, three-study research project. This Chapter also presents the Finding and Discussion of the co-design Study 3, which is a four-step co-design process which was used to develop the MWRP.

6.2 Aims and objectives

The aim of Study 3 was to use co-design to develop a PA and SB resource *The Move with Recovery Programme* (MWRP) that can be used by rehabilitation MH services to increase PA levels and reduce SB among outpatients with SMI within existing resources available. To achieve this aim, Study 3 had two key objectives. These were:

1. To modify and use an EBCD approach, harnessing service user experience using data from Study 1 and Study 2 and applying multidisciplinary co-design methods to develop the MWRP.
2. To carry out an evaluation of the EBCD process by conducting semi-structured evaluation focus groups with participants of the co-design process.

6.3 Methods overview

Details on the exact methods used during this Study are documented in Chapter 3. The MWRP is designed to overcome the PA implementation gap between research and practice that exists presently in MH services. The MWRP has been developed from a four staged facilitated multi-stakeholder co-design process was undertaken over the course of 5 weeks. This process drew from the work carried out during Study 1 and Study 2 of the wider research project to influence the nature and trajectory of the co-design work.

6.3.1 Procedures overview

Study 1 and Study 2 (Chapter 4 and 5) contributed to the *Gathering Experiences* phase of this EBCD project as previously shown. In doing this, both contributed towards co-design phases during Study 3. While the findings from Study 1 were used to provide contextual support to co-design working, Study 2 was used to specifically inform co-design work through the use of a “Touch point” and salient Study 2 themes within a trigger film. A master film showing Touchpoints sequenced narrative of service user interviews was then developed using actor portrayal. The detailed methods of this process are discussed at length in Chapter 3.

The modified EBCD approach used in this current research study, while similar to traditional EBCD, brings the experience of the service user (Study 2) to the centre of the multidisciplinary Co-design process through the use of the experience-based narrative trigger film. From here, the co-design work was facilitated to identify solutions to barriers, and prototype PA programme designs using the TIDieR guide for better reporting of interventions. This provided a blank canvas framework from which necessary PA programme information was discussed and inputted (Hoffmann et al., 2014).

6.3.2 Data analysis

Details on the data analysis carried out in Study 2 are shown in Chapter 5. However, prior to in-depth interpretivist analysis carried out, a broad thematic analysis using Braun and Clarke (2006) was carried out to identify ‘Touchpoints’. Touchpoints are defined as moments that shape experience within a narrative, whether good or bad (Robert, 2013). Touchpoints were generated following multiple reads of data and coding using QRS Nvivo®.

6.3.3 Ethical approval

Ethical approval was obtained by Waterford Institute of Technology and the HSE South-East Research Ethics Committees. Details of ethical considerations taken during this Study are detailed in Chapter 3, section 3.8.

6.4 Results – The Move with Recovery Programme

This section gives a description of the outcomes that were shown during different sessions of Study 3. In all (n=14) people participated across the multiple co-design stages of Study 3 (Table 6-1). This sample included four MH service providers including n=2 Training facilitators, one area manager for local services, and one OT. The table (Table 6-1) provides a description of the participants that took part in the co-design process and subsequent evaluation work.

Table 6-1. Description of co-design participant

Assigned number	Role	Age	Sex	SU (Current PA)	Do you deliver PA in your service?	Session 1 attended	Session 2 attended	Session 3 attended	Session 4 attended	Total number of sessions attended
1	Service provider	50-54	Female	NA	NA	Yes	Yes	Yes	Yes	4
2	Service provider	50-54	Female	NA	NA	Yes	Yes	Yes	Yes	4
3	Service provider	45-49	Male	NA	NA	Yes	Yes	No	No	2
4	Service provider	35-39	Female	NA	Yes	No	No	Yes	No	1
5	Service user	35-39	Male	Regular participant in structured PA Regular walking Regular resistance exercise	No	Yes	Yes	Yes	Yes	4

6	Service user	25-29	Male	Regular participant in structured PA	No	Yes	No	Yes	Yes	3
7	Service user	50-54	Female	Regular participant in structured PA	No	Yes	Yes	Yes	Yes	4
8	Service user	>60	-	Regular participant in structured PA Regular walking	No	Yes	Yes	Yes	Yes	4
9	Service user	50-54	Female	-	No	Yes	No	Yes	Yes	3
10	Service user	30-34	Male	Regular participant in structured PA Regular resistance exercise	No	Yes	Yes	Yes	Yes	4
11	Service user	30-34	-	Regular walking	No	Yes	Yes	Yes	Yes	4
12	Service user	40-45	Male	Regular participant in structured PA	No	Yes	No	Yes	Yes	3
13	PSW	50-54	Female	Regular walking	No	Yes	Yes	Yes	Yes	4
14	PSW	30-34	Male	Regular participant in structured PA	Yes	No	Yes	Yes	No	2

The MWRP is the outcome of multiple iterative co-design research stages, drawing from Study 1 and 2, and culminating in a developed resource that can be used by rehabilitation and recovery MH services (see Appendix 21). The content of the MWRP will be discussed in more detail in this Results section. First, the outcomes from iterative co-design work are reported here in order to elucidate the steps which have brought about the MWRP.

In relation to Co-design Session 1, there were no direct outputs as a result of carrying out this process. In this session, participants were facilitated in learning about PA and SB with respect to safety, guidelines. In addition, Session 1 allowed for research findings from Study 1 (A) and Study 1 (B) to be shared with the co-design participants for discussion. Similar to Co-design session 1, Co-design session 2 did not have direct outcomes in the form of results either. In this session, participants were tasked with emotional mapping exercise and storyboard work that were based on data brought forward from Study 2. In this work, participants reflect on the experiences of others and begin to process and consider the experiences of others in the context of their service experience. This emotional mapping exercise is detailed in Chapter 3.

At Co-design Session 3, participants engaged in prototyping work, which generated output for the first prototype draft of the MWRP. The priority issues identified by the co-design participants during this stage are outlined below in Table 6-2. Here the priority issues for the MWRP are identified by the participants (shown left), and the response Action plans devised by the collaborative working of the co-design group for including in the prototype MWRP are shown on the right. These response Actions were developed through facilitated solution focused discussion of the priority areas. Where group consensus was not achieved in relation to identifying an Action point, the group were asked to take a secret ballot on an issue.

Table 6-2. Co-design Session 3 Priority issues and Action points

Priority issues identified	Response Action Points
Enjoyment ethos Social ethos	- Group-based PA - Beginner – Advanced (Encompassing all levels)
Service user involved with running (leading role) Staff can take part too	- Recovery college based - Co-delivered programmes - Peer support - Volunteer based - Centred on lived experience - Champions - Face to face
Light intensity activity/walking (between programme components)	- Structured walking sessions
Option to sample/try gym equipment	- Outreaching programme with introductory to "new" PA aspect
Not group defined like current programmes	- Open to all who have contact with services
Staff don't have training or knowledge to "lead" PA Safety	- Input from external expertise - Education o Medication management o Incorporating PA in my day o Motivation o GP Clearance - Discussion/interactivity
Partnership with external agencies (community-based)	- Structured links with outside (community-based) agencies - Mental health relevant – e.g. PA after my first admission etc.
Weekly	- Time tabling
How does programme recruit?	- Referral - Advertising - Time tabling - Word mouth - Ad campaign
Variety: Walking groups always lose momentum	- Variety emphasis - Adaptability to group needs
Sustainability What if a participant has to leave suddenly? What support can be offered	- Community in-reach - Strong community connection
Emphasis on special rates or low-cost PA	- - Connection with community-based programmes, emphasis on low cost.
Siloing of PA programmes within different mental health groups	- Leveraging recovery college
Introduce new sporting organisations	- Guest speakers, visits
Service users static within programmes Challenge introducing new member	- Progression pathway - Return pathway (Participants giving back)
Recognise low self confidence	- Supportive environment
Programme needs resilience if social support breaks down	- -
Not exercise classes per se	- Introductory approach to PA

In Co-design Session 4, participants reconvened and were facilitated in small group co-design work and subsequently larger co-design work by the researcher to further develop refined Action points based on a newly developed MWRP prototype. This newly developed prototype was developed by the researcher on the back of the data gathered during prior co-design sessions. Participants were facilitated to use the new draft prototype of the MWRP, working methodically through each of the programme components to develop new priority issues with the draft prototype as they saw them. Following this, participants were facilitated in developing new Action points to address the new priority issues outlined in group work. An outline of the priority issues from the draft prototype and the response Action points in Co-design session 4 are shown together in Table 6-3 below.

Table 6-3. Prototype review issues in Co-design Session 4

Prototype issue	Action points
The time frame between Motivation, Education and Support (MES) sessions is too large to form group bond	• Programme structured so that walking/light PA sessions are structured between MES sessions • MES sessions should be bi-weekly • Emphasis on social connection • No longer than 3 weeks without contact with group
Programme spanning year is too long	• Shortened/condensed programme
Need for more integrated links with community-based MH services/and local sports groups	• Explicitly show links and contact information
MES session 3 focus on information about PA available within existing MH services	• Insufficient PA available within existing MH services: omit MES session • MWRP must be accessible to persons across all mental health services
Recovery college ethos is community-based care: More emphasis on being active in the community needed	• Explicitly show links and contact information • Highlight in the aims and objectives • Pathways out and back – community programmes
Facilitators will be hard to recruit	• Should be sourced from existing recovery college volunteers • Trained/Co-production • Recovery college provide support to leaders • PSW • Leader should be confident and capable • Rotating leader system (one stays to assist transition)
Need for promotion of MWRP in services	• Explicitly specify that services should promote people in joining

Support and motivation	• Follow-up on drop-out • Text messaging • Goal setting • Shared focus
Challenges with joining	• Open to anyone who is connected to mental health services • Advertised in community-based settings • Inform existing service providers • Develop network • Small launch • Mainly focused on a self-referral/not prescriptive • Joining mid-way through MWRP
PA sessions should run concurrent to MES	• People may wish to avail of some or both PA sessions or MESs • PA sessions must be accessible to all levels
Site visits	-
MES = Motivation and Education Session; MWRP = Move with Recovery Programme	

In order to reflect the aim of the overall research project, the developed MWRP carries the aim to improve PA levels and reduce SB of people with SMI in rehabilitation and recovery MH services. The MWRP utilises the existing Recovery College model, in so far as it can be timetabled into a recovery college schedule and can utilise physical space of the Recovery College due to the peer-led, group-based nature of the programme. In addition, the MWRP is inherently recovery orientated in its design and recovery-focused in its aim, therefore providing a fit with the Recovery College model.

The TIDieR framework was used to shape the MWRP design in terms of 'intervention component parts' (Hoffmann et al., 2014), thus ensuring that all aspects of a PA intervention which may require attention were considered. A detailed description of this is contained in Chapter 3, Section 3.8. The MWRP centres on nine key action points which are outlined in the resource and shown in Appendix 20. These key Action points have been developed to frame the MWRP and in doing so, participants generated these points to reflect all levels of the SEM. The MWRP is the primary outcome of this extensive modified EBCD research (MWRP in Appendix 21). The nine key Action points of the MWRP are listed in Table 6-4 along with the relevant SEM level within which they primarily seek to address factors that influence PA on.

Table 6-4. The Action points of the MWRP

MWRP Action points	Social Ecological Levels
1. Group setting	Interpersonal/Organisational and community
2. Co-delivery	Interpersonal/Organisational and community
3. Inclusivity	Organisational and community
4. Leaders	Intrapersonal/Organisational and community
5. Bridging to the community	Organisational and community/physical environment
6. Education	Intrapersonal
7. Motivation	Intrapersonal
8. Safety	Policy
9. Reinforcing PA	Policy

6.5 Evaluation of Co-design

This section reports on a brief process evaluation carried out by the researcher in relation to the co-design components of the EBCD approach used here to develop the MWRP. This evaluation of the Study 3 within the modified EBCD process examined key implementation outcome measures which indicate success for the co-design work. Evaluation work, by definition, will vary between disciplines. However Naidoo & Wills (2016) provide a broad definition of evaluation to be a systematic examination and assessment of features of a programme in order to produce knowledge that can be later used by other stakeholders. In this regard, there are a number of reasons for carrying out an evaluation, which should be defined. At a basic level, evaluations are needed to assess whether objectives were fulfilled and that the methods to do so, were executed in an appropriate and efficient manner (Naidoo & Wills, 2016). While it is important to acknowledge that EBCD is an effective approach to service development in previous MH research (Cooper et al., 2016; Larkin et al., 2015; Springham & Robert, 2015), it must also be considered that programmes can be sensitive to local factors which bear influence on the specific programme despite already established effects (Naidoo & Wills, 2016). For instance, in Springham & Robert (2015), EBCD was shown to bring about service development measures which resulted in reduced complaints in an inpatient acute setting. Such positive outcomes from the application of EBCD in a distinct an environment as that of acute MH setting should not be assumed to readily transfer to PA provision in an outpatient and community MH settings.

In many respects, EBCD is a new and developing participatory approach to service development (Robert, 2013; Bate and Robert, 2007). Considering this, there are only a few research studies that have sought to carry-out an evaluation of the EBCD process, with very little published research which follows systematic evaluative steps (Donetto et al., 2015; Mulvale, Miatello, Hackett, & Mulvale, 2016). Recently, Chisholm, Holttum, & Springham, (2018) have carried out an evaluation, post EBCD project, to understand the mechanisms attached to successful implementation, showing that conflict between participants presented as a challenge to the feasibility of using EBCD among multi-stakeholder MH populations.

Implementation science calls for specific outcomes to be measured in terms of evaluating success. In the context of implementation research, differentiations are made with regard to outcomes of interest compared to clinical effectiveness. Proctor *et al.* (2011) provide a categorisation of outcome specifications which are pertinent to implementation research. These include: Acceptability; Adoption; Feasibility; Fidelity; Implementation cost; Penetration and Sustainability. In applying these concepts to the current EBCD approach, there are a number of salient points to be made. First, pilot testing of the MWRP is not within the scope of the current research project. This project deals specifically with the EBCD process of developing the MWRP. As such, only specific constructs outlined in Proctor *et al.* (2011) will bear relevance to the evaluation of the co-design with respect to implementation. These are: (i) Acceptability. This pertains to the perception among stakeholders that a practice or innovation is agreeable and or satisfactory. (ii) Adoption. This pertains to uptake of an innovation or intervention (iii) Appropriateness. This pertains to perceived fit and or compatibility of an innovation or intervention. (iv) Feasibility. This pertains to the extent to which an innovation can be used within a setting (Proctor et al., 2011). In this regard, the evaluation carried out here aimed to explore participants’ views of the four-stage co-design process with respect to Acceptability, Adoption, Appropriateness and Feasibility.

6.5.1 Evaluation methods

This section demonstrates the methods used to carry out a brief evaluation of the four stage co-design (Study 3) component of the modified EBCD approach.

6.5.1.1 Evaluation design

Following the completion of the fourth co-design session (See Chapter 3, 3.8 for Methods of co-design work), a brief focus-group feasibility study was undertaken using exploratory qualitative methods. The evaluation comprised of a focus group interview which was carried out to ascertain acceptability, feasibility, and appropriateness of the co-design component of the modified EBCD approach as per the areas of evaluation laid out in Proctor *et al.* (2011).

6.5.1.2 Evaluation procedures

A brief topic guide was devised based on the reading of relevant literature with respect to previous EBCD evaluations and the aims and objectives of the co-design process (Chisholm et al., 2018; Donetto et al., 2015). This topic guide included broad open-ended questions with respect to Acceptability, Adoption, Appropriateness and Feasibility of the co-design process. In addition, a series of probing questions accompanied the topic guide to draw out clarification of points raised by participants. After the final co-design session, participants that had attended the fourth session were then invited to participate in an evaluation-type focus group. In this regard, participants were provided with refreshments after the final co-design session. It is at this point where participants that did not want to take part in the evaluation process could depart. Two participants that had attended the final co-design session opted to not take part in the evaluation focus group. Agreeing participants were provided with a brief information form about the evaluation focus group, the process involved and reasons behind carrying it out during the refreshment break, allowing a period of contemplation. During this refreshment break, the researcher also answered verbal questions on the evaluation. All participants were made aware of the anonymised audio recording carried out and all participants provided informed consent for this to take place. As with all of the co-design sessions, participants were reminded of the support services available to them should they so require following the interview. The recorded focus group was transcribed verbatim following the completion of the focus group and field notes were recorded by a supervising researcher.

6.5.1.3 Evaluation data analysis

The researcher carried out a broad thematic analysis of the transcripts. Based on limited existing evaluation work of EBCD research (Chisholm et al., 2018), the evaluation of this current co-design stage of the EBCD project sought to investigate the following: (i) How do the co-design participants perceive the project and their participation within it? (ii) What factors assist or hinder the co-design process with respect to success? In analysing this focus group, implementation outcomes as defined by Proctor et al. (2011) were used in searching for themes.

6.5.2 Evaluation results

Nine participants took part in the evaluation focus group (N=2 service providers, N= 6 service users, N=1 PSW). The results of the process evaluation are shown below. Here implementation themes are shown from the analysis of data in Table 6-5 below.

Table 6-5. Summary of implementation evaluation findings

	Positive process	**Negative Process**
Appropriateness	Prototyping reflected the process	Not being sure what is expected of you The location of sessions Expectation of an immediate group formation after Co-design Technical language
Acceptability	Prototyping gives a sense of achievement	The challenge of being in a group
Adoption	Inclusive and welcoming facilitator Close observation	No manager or psychiatrist present Not enough staff present
Feasibility	Working is small groups works well Regular refreshment break	Supports for such programme do not exist

6.5.2.1 Appropriateness

Participants spoke of the perception that the prototype MWRP was reflective of the co-design process for which they had been a part of for the four sessions that ultimately led to the MWRP development. At the same time, participants discussed a challenge with respect to the appropriateness of the advertisement/recruitment process that was used to engage service users and service providers in the co-design aspect of the project.

> *SP 2: Yeah, I suppose it is just again that that day I didn't think the interview group that day was taken from a broad enough areas. Certainly, my impression on that day was that this is talking about residential services rather than the general population of service users and I thought, should I actually be here at all* **(P2 – SP, Female).**

One participant discussed her persistent misunderstanding of the objective and the aim of the co-design work. While her points provide learning for greater clarity within informed consent and advertising of EBCD and specifically co-design work in this area again, it should be noted that, this individual's sentiments did not appear to reflect the wider groups'.

> *Eh… group session talk about physical health, but yet there was nothing actually put in place. I thought that at the end of the four or five weeks or whatever it was, that there would be something put in place at the end of the five weeks if you know what I mean so…(***P1 -SU, Female)**

In this co-design component of the EBCD project, time constraints and participant availability appeared to be a concern raised among participants. Participants discussed a feeling of often not having had enough time to complete tasks set during co-design sessions. Two of the participants brought up the issue of the overuse of technical language during the co-design work.

> *Yes, sometimes the language, you-know the terms? I think we discussed that in the first few weeks…*
>
> Just because I wasn't sure what was expected of me **(P4 – SU, Male)**.

6.5.2.2 Acceptability

In looking at the co-design process in relation to acceptability, a number of participants remarked on the sense of achievement that was attained from seeing a finished MWRP outcome at the end of the process with which they had been involved in.

> *It was lovely to see it in a document. You would get a bit of a buzz seeing it in a document* (**P1 -SU, Female).**

However, in another consideration of acceptability, one participant discussed the challenge that small group setting can pose for individuals with acute mental illness symptomology, which many participants within the group agreed upon.

> *I found there was a lot of talking going on at the time and that it was hard to concentrate because when you are recovering from mental illness sometimes your concentration isn't very good but there was a lot of talking going on the last session* **(P4 – SU, Male)**.

5.4.1.3 Adoption

When asked to discuss adoption, participants largely discussed their beliefs with respect to the devised MRWP prototype that had been developed. Participants agreed that the programme would be more effective if more management and doctors bought into the programme.

> *Yeah get buy in, get buy in from the top that the consultants, community psychiatric nurses, all those people will see physical activity as, as an important part of the journey as medication, that it would be seen as another part of the jigsaw to recovery* **(P2 – SP, Female)**.

5.4.1.4 Feasibility

The benefits of smaller group work within the co-design process were captured through a number of participants sharing their views on this matter. One participant discussed their perceived benefit from working as part of small teams.

> *I thought it was interesting to hear everyone else's views. You know, it was great to see things that you would never think of yourself; different approaches from different sections. You-know different ideas. Even going back to the goal setting that* (Names other participant) *brought up today; I thought it was great. Learning you-know? You wouldn't think of using yourself* **(P 1 – SU, Female)**.

Participants also discussed the social outlet that was achieved through the EBCD process.

> *Why? It is all back to the point, and I will answer the question, it is because the bonding was there, people got the chance to bond more by then. People felt valued then* **(P2 – SP, Female).**

One participant identified that the process required regular breaks for informal social opportunities with other participants to best achieve good feasibility.

> *And do the social part of it in the kitchen so we can just chat (Laughter), that was nice and that helps to bring the group together* **(P3– SU, Female).**

Following the completion of the four Co-design sessions, participants at the fourth and final co-design session were invited to participate in a focus group in order to conduct a

Process Evaluation of the co-design process and the outcomes generated from the current EBCD project.

6.6 Discussion of Study 3

The modified EBCD approach shown here outlines the process of developing evidence-based programme, informed by experience, to develop the MWRP. This research presents a novel approach to PA and SB programme development first conceptualised in the literature at the commencement of this project (Matthews et al., 2017). To the best of the researchers knowledge, no other studies have explicitly utilised EBCD as it has been conceptualised in Bate and Robert (2007), or modified for the purpose of PA programme development (Matthews et al., 2017). As such, this project is novel in its approach to service development. The EBCD process has been modified to meet the requirements of its proposed application in this project. This is detailed in earlier sections Chapter 3.

The challenges of engaging people with SMI in regular PA is well documented in the literature (Brand et al., 2016; Rebar & Taylor, 2017). Termed a translational gap, there is much evidence to suggest that successful PA and SB interventions have a limited translational knowledge for clinical practice (Deenik et al., 2019). In an effort to bridge this gap, this research project has utilised and modified an EBCD approach to service design. Experience-based Co-design, which is partially rooted in phenomenology, is a design approach that holds experience at the core of the process (Larkin et al., 2015). Therefore, this research project sought to develop PA provision around the experience of service users and other key stakeholders, thereby making PA suitable and sustainable.

There are existing examples of previous research that have utilised methods of co-production and ‘participatory research’ in an effort to overcome the aforementioned translational gap. For example, Hoffmann *et al.* (2015) utilised ‘participatory research’ to develop a community-based tailored PA programme for people with SMI in Pittsburgh USA, called ‘On the Move’. Through two separate focus group session, participants were reported to have developed a PA programme, encompassing exercise trainers and low impact aerobic exercise and low intensity strength training for 40-minute, twice weekly. Unfortunately, no information is provided on the nature of ‘focus’ groups carried out. In addition, Hoffmann *et al.* (2015), do not utilise EBCD, per se, in the sense that the six-stage EBCD process is not followed under any modification guise. Experience-based Co-design has been shown in previous research to effectively level power relations between multidisciplinary stakeholders (Bowen, Dearden, Wright, Wolstenholme, & Cobb, 2010). Within Hoffmann *et al.* (2015), it is unclear if researcher bias may have influenced the outcomes reported in terms of PA programme design from co-production work.

In addition to the such participatory methods, there are also examples of comprehensive co-design PA programmes in MH settings (Graham et al., 2017; Wheeler et al., 2018). Both of these two listed studies can be differentiated from the EBCD approach used in this current study. For example, one study (Wheeler et al., 2018), used a multi-stakeholder co-design approach including integrated exercise physiologists to develop strategic recommendations for enhancing the interface between MH services and exercise facilities to support PA as part of integrated care. This outcome is separate from the current research, which centred on developing a specific programme for MH services in the absence of integrated exercise practitioners (Matthews, Cowman, & Denieffe, 2018). Key strategies identified by service users and exercise practitioners in Wheeler *et al.* (2018) include the need for; improvements in knowledge and understanding of MH problems, improvements in confidence to address and communicate about barriers to PA among people with SMI, improved awarness of the challenging environment that characterise exercise facilities, structured community-based PA that normalise PA routines, the need for peer-support, low-cost PA alternatives. The last three reccomedations identified in Wheeler *et al.* (2018), are relective of key co-design Action points that arose during co-design session 3 in the current research (Service users have a leading role in programme, emphasis on low-cost PA, and partnership with external community-based PA). This finding suggests a dependability from the findings of the current co-design work.

The use of a narrative trigger film has been shown in review research as a powerful tool from which experiences can be translated from service user to service provider (Donetto et al., 2014). With this considered, extensive efforts were made in Study 3 to include the use of a narrative trigger film despite ethical restrictions on filming the patients. Previous co-design and EBCD studies that share similarities in approach to this current research have neglected to include the use of narrative trigger films. For example, in Larkin, Boden and Newton (2015), a qualitative study taking a phenomenological approach to inquiry which underwent subsequent modification into an EBCD study to improve acute services. In the referenced study, the decision to not include narrative trigger films was done to minimise inequities in the group. To the knowledge of the researcher, the current study is the first EBCD study to use a professional actor to recreate service user interviews. In doing so, the use of the actor's film, was observed to be beneficial to a point, as service users commented on positively on its use during the evaluation. That said, there was a noticeable and observable lack of authenticity with this method. In light of this, future research using such an EBCD approach could opt to carry out the gathering experiences aspect of data collection in another region of Ireland, thus limiting the risk of breaching participant anonymity, and therefore increasing the likelihood of receiving approval from Research Ethics.

From looking at research that has previously applied EBCD within a MH settings, considerable variance is seen throughout research methods and approaches that have helped to inform the direction of this current modified EBCD approach. For instance, there are examples within MH literature where projects have begun their initial stages as stand-alone research with an Interpretivist Phenomenological Analysis framework. However, following service level demand, research has been subject to modification to convert the research study into an EBCD approach to service development (Larkin et al., 2015). The applicability of this research conversion is owed to the IPA framework, which is by definition an analysis of experience, and so aligns with the EBCD approach. To fit the EBCD approach, Larkin, Boden and Newton (2015) carried out a reduction of complex themes generated during IPA in order to form 'touchpoints' which represent a key moments of the narrative, rather than interpreted phenomena. In the current research, the wide applicability of phenomenologically informed research in feeding subsequent co-design work has been used to develop the modified pathway, where a stand-alone phenomenologically informed qualitative research study (Study 2), has been also used to develop touchpoints and themes that are influential in determining co-design work outcomes.

Larkin *et al.* (2015) has suggested that MH service user participants may benefit from engaging in research training of some description in order to prepare them for the dynamic of Co-design or co-production. We postulate that this may develop service users' capacity to participate in this process and therefore mitigate future projects using service users' inclusion in a tokenistic way. In this current research, and based on the brief process evaluation shown detailed in the previous section, it seems that competency in facilitation may have an important role in supporting vulnerable MH service users in participating in co-design work.

6.6.1 Key actions of the Move with Recovery Programme

The primary outcome of using a modified EBCD approach was to develop the MWRP based on the iterative process including Studies 1, 2 and 3. The programme aims to improve PA levels and reduce SB of people with SMI in rehabilitation MH services through the platform of the Recovery Colleges. In doing so, the MWRP is shaped and structured around nine key action points which were developed out of the iterative co-design process (Appendix 20). These are:

1. Group setting
2. Co- delivery
3. Inclusivity
4. Leaders
5. Bridging to the community
6. Education

7. Motivation
8. Safety
9. Reinforcing PA

In the subsequent section, each of these Action points will be explained and supported with reference to the modified EBCD process, including Studies 1, 2 and 3, in addition to the literature which provides further rationale for their inclusion in the MWRP.

6.6.1.1 Action 1: Group setting

Group-based work is Action point 1 of the MWRP. In this way the MWRP is structured in a manner that Motivational Education Sessions (MES) and activity within are done through an established group setting. There are a number of examples of people with SMI benefiting from group-based PA. In many respects, dissemination challenges with intervention research means that it is difficult to separate out beneficial effects that are causal with regard to PA that is group-based, community-based etc. For example, Van Citters *et al.* (2010) utilised community-based group PA for people with SMI with significant beneficial effects on PA levels and MH symptoms. Importantly, in the context of the MWRP, this study indicates the effective marrying of this action point (*Group setting)* and Action point 5 (*Bridging to the community)*.

Cross-sectional research shows regular contact with family and peers can provide a support structure that is associated with significant increases in PA levels among people with SMI (Aschbrenner et al., 2013). Intervention research shows that effective group-based PA has been used with subsequent increases in PA levels where MH symptoms have improved among people with SMI. Yet, these intervention studies are not without limitation in relation to their application for dissemination as discussed in Section 2.6.8 of the critical review. However, in this instance, qualitative research can provide useful contextual information. For instance, Section 2.5.5 of the critical review shows a number of qualitative research studies that have explored PA within group sessions for people with SMI. These studies have shown group-based PA as beneficial in relation to engaging people with SMI in PA and furthermore, improving adherence to PA (Huck et al., 2018; Carlbo et al., 2018**;** Hargreaves et al., 2017; Leutwyler et al., 2014; Wright et al., 2012). For example, Leutwyler *et al.* (2014) interviewed sixteen participants with SZ in relation to barriers and facilitators of PA. Participants that discussed group-based PA as a PA facilitator discussed phenomena such a sense of belonging in being in a group setting, and the role that peer-based social support has in keeping people with SZ engaged in PA.

6.6.1.2 Action 2: Co-delivery

As per the outcomes of co-design work, the MWRP is to be a co-delivered PA programme. This means that the programme should be facilitated by a MH service provider and a MH service user with a SMI, working voluntarily and collaboratively (See Appendix 21 for the MWRP and more details on co-delivery structure of the MWRP). This is an Action that arose directly from the co-design work, and was not alluded to in Study 1 or 2. Despite some cross-over between this Action point and that of *Leaders*, the current research co-design work elicited extensive detail for the role of peer support in implementing the MWRP. It is possible that a number of participants in the current research were students of the recovery college, and hence, placed value on the role of peer-support programmes through their exposure to a facility where peer-support is embedded within the ethos. Co-delivery in this sense relates to the co-delivery of sessions by the designated leaders of the MWRP. At this Action point Co-delivery refers to the use of a “peer” which may be a PSW, which is someone with a history of mental illness, but with sufficient recovery, and therefore in a position to offer support to other MH service users (Davidson et al., 2006).

There is emerging evidence to suggest that PSWs can be used within MH settings to support PA interventions. While promising, the quantity of research is small and there is much heterogeneity between studies which have adopted this approach (Stubbs, Williams, Shannon, et al., 2016). In one study, O’Hara *et al.* (2017) utilised a group-based peer-led lifestyle intervention where peers supported a 12-week lifestyle information intervention used qualitative and quantitative means of measuring feasibility and acceptability. O' Hara and colleagues showed the programme to be highly acceptable and feasible within the MH supported housing programme in the USA where the study took place (O'Hara et al., 2017). This study does not report PA levels or related outcome measures in relation to success. However, it does indicate the applicability of peer-based support in relation to educational components of a lifestyle intervention for people with SMI.

An important stipulation which arose during co-design work was that the MWRP must be integrated within recovery focused MH services facility. Within the co-design groups, the recovery college was identified as a suitable location from which the MWRP may be established. Using the Recovery College as a locational setting for the MWRP allows for a PA programme that can operate within the parameters of existing MH services, in the absence of additional funding or resources. Previous interventions (O'Hara et al., 2017), have noted a benefit in utilising PSW within services where such persons are already integrated within routine service delivery.

6.6.1.3 Action 3: Inclusivity

Action point 3 of the MWRP is inclusivity. This Action point was incorporated into the programme in the fourth co-design session as a solution to siloed PA programmes that are ongoing within individual services. In this regard, this Action has been developed on the back of themed findings from Study 2, where service users discussed a loss of social support when trying to seek out more advanced PA opportunities. The premise behind this action point is that any persons with a connection to the recovery college should be able to join the MWRP. Taking this all-inclusive approach, as per the specifications of prototyping work of the co-design teams, is important to reflect a recovery orientated MH service.

Additionally, the third co-design session prototyping exercise which received impetus from qualitative research findings in Study 2, brought about the inclusion of structured PA (Walk/Run) meetings into the MWRP. These sessions should have an emphasis on light intensity PA, in order to promote inclusivity among less active persons. The evidence for including light intensity PA such as walking will be discussed in *Action 9*.

6.6.1.4 Action 4: Leaders

The developed MWRP is structured in a manner that Motivational and Education Sessions (MES sessions) and light intensity PA sessions are built into 21-week cycles of the programme. A visual of this 21-week cycle process is found in the sub-Appendix I of the MWRP, which is located in Appendix 21 of this document. These sessions are to be facilitated by a service users (or PSW) and service provider together as seen in Action point 2 (*Co-delivery*). This Action was developed on the back of discussions of the Recovery College model during Co-design Session 4. In a sense, this Action was developed as a response to facilitating Action 2 – *Peer delivered.*

6.5.1.5 Action 5: Bridging to the community

A key Action identified by participants in co-design sessions was the emphasis on community-based PA. This Action was identified among participants for a number of reasons. These were, (i) Study 1 (A) and Study 2 both identified the value that community-based PA can have for people accessing MH services. (ii) The recovery college, which was identified a programme central point, is community focused MH service (Perkins et al., 2012). Recovery education delivered through the recovery colleges must value the principles of lived experience, strive to increase knowledge, facilitate peer support, support co-production, nurture experimental opportunities to grow and centre around education (Health Service Executive, 2018). So, while the recovery college is well suited for the establishment of the MWRP, the programme must also fit the ethos of the Recovery Colleges in relation to structure.

To best align with the ethos of Recovery Colleges, the MWRP should strive to connect participants to PA opportunities within their community. (ii) The overarching viewpoints of co-design working groups were that existing MH services do not have the capacity to provide suitable and adequate PA opportunities to meet the desired specifications developed through the co-design process for the MWRP. As a result, a number of community-based PA initiatives/resources that are accessible within the region of this research were identified by co-design participants in co-design meetings as prospective opportunities believed to be suitable to users of the MWRP. These programmes included:

Parkrun: Parkrun is a free, registration-based PA initiative across 20 countries globally. Parkrun is a community-based PA initiative, inviting participants to engage with 5km of aerobic type exercise at an intensity of their choice. Parkrun has a volunteer led format, whereby participants are invited to contribute time to organising in addition to taking part. Parkrun has an emphasis on inclusivity and community, and as such reflects the ethos of the MWRP. Within the SECH region there is a minimum of one parkrun in each of the five counties (Parkrun, 2004).

Go for Life/Age and opportunity: Age and opportunity are a national organisation that support a number of PA initiative that are run at a local community level. These include, becoming an Age and Opportunity Physical Activity Leader. In doing this, an individual attends a brief course to teach them how to become a PA leader to take on exercise groups for older individuals in activities such as walking, dance and other simple games. While there is a commitment of nine training sessions involved with becoming a leader, the process has no cost attached (Age & Opportnity, 2019).

In becoming an Age and Opportunity PA Leader, participants would be able to feed their skills back into the MWRP group to support the MWRP leaders or to be a leader for both. Having an individual from the MWRP becoming a PA Leader with Age and Opportunity creates links with the MWRP group and initiatives run through Age and Opportunity, such as the Go for Life Games and the FitLine (phone motivation service).

Whilst the Go for Life/Age and Opportunity initiatives are targeted at older persons (>45 years), it is apparent that this age level is considerably less than that of the mean age of persons in rehabilitation and recovery services in Ireland, which have been exemplified in Study 1 A of this current research.

The In SHAPE programme is a “mentor led” lifestyle programme, which engaged n=76 transdiagnostic people with SMI in an individual in an intensive community-based PA programme. The intervention effectively increased participants’ levels of PA and simultaneously improved negative symptoms and cognitive functioning during the intervention (Van Citters et al., 2010). A number of intervention component parts are important to note with respect to the development of the MWRP. First, participants were exposed to motivational support and in addition, participants were provided with free access to fitness facilities in their locality.

6.5.1.6 Action 6: Education

Findings from Study 1 (A) showed significantly stronger barriers to PA in relation to *Motivation and goals* and *Beliefs in the consequences* of PA. As such it has been postulated that the most inactive persons with SMI would benefit from education and motivational programmes to target the most inactive people with SMI. This Study 1 (A) finding was brought to co-design groups and it was decided that it is pertinent to include education within the MWRP. Such education should include recent research discoveries in the field: these should include information on weight control and SMI, the benefits for MH symptomology and learning about the barriers to PA and how to overcome them. In this regard, the educational aspects of the MES sessions should target both the service user and the service provider participants of the MWRP.

6.5.1.7 Action 7: Motivation

Motivation is Action 7 of the MWRP. Within Chapter 2 of this research project, research was discussed which demonstrated the value of fostering autonomous regulation of motivation for people with SMI that have adopted a new PA behaviour (Vancampfort, Moens, et al., 2016). The MWRP has Motivational and Educational Session which are designed to foster autonomous regulation by making PA about social connections, exploring the local community, and improving MH symptoms. Within the MWRP, there are a series of MES sessions which focus on exploring and maintaining motivation to PA. The MWRP draws on the *Lets Get Active* report (Broderick and Moran, 2018) in facilitating participants to identify and overcome personal barriers to PA and carry out goal setting on PA.

6.5.1.8 Action 8: Safety

While safety of participants in engaging with PA is paramount, in Co-design session 1, participants were tasked with exploring issues relating to safe PA programming as per best practice guidance (ACSM, 2014; Stubbs & Rosenbaum, 2018). Throughout all stages of co-design programme development, the facilitator asked participants to consider standards within the referenced work. Additionally, safety standards from the aforementioned and also Broderick & Moran, (2018), are included in the MWRP to guide the PA Leaders in providing safe PA.

In addition to the above point, safety considerations to protect Leaders in managing sensitive issues are also in place, as per the outcomes of co-design work and detailed in the resource under Action 8. A number of co-design outcome Action points, such as Co-delivery were built in to the MWRP. The MWRP is also connected to a recovery college. As such, it is the responsibility of Leaders to report back to recovery college management for any issue that occur in sessions to be documented.

6.5.1.9 Action 9: Reinforcing Physical Activity

Reinforcing PA is Action 9 in the MWRP. Initially, prototyping work carried out during Co-design session 3 made clear that it would be necessary to include structured light intensity PA into the structure of the MWRP. The structured contact time between PA Leaders and participants in the MWRP is largely centred on the attendance at MES sessions or the later added Walk/Run meetings. It is these informal Walk/Run meetings which give credence to this final Action point. Qualitative research knowledge generated in Study 2, which was imparted to participants that engaged in Study 3, provided the impetus in developing the concept of Walk/Run meetings that are structured into the MWRP. The co-design group stipulated that Walk/Run sessions should have an emphasis on light intensity PA.

The MRWP which is in a sense restricted within existing resources within current service provision has incorporated light intensity group-based PA session, led by the PA leaders. This measure will present additional logistical demands on PA leaders which must be accounted for within the design of the MWRP. However, based on current RCT findings, the inclusion of structured PA may be of considerable importance in relation to programme outcomes. Recently in the UK, a NHS working group established the STEPWISE RCT among a sample of over four hundred people with SZ, randomised to either intervention or control (Holt et al., 2018). The RCT implemented a PA and dietary education programme over 12 months. Participants of the STEPWISE intervention received four weekly sessions lasting 150 minutes each on PA. Following this, participants received regular motivational support phone calls. The STEPWISE provides robust evidence that motivational and educational intervention alone is not sufficient to effect changes in PA levels or anthropometry among people with SMI. The primary aim of the MWRP is clear in this regard, and there is therefore a need to include supported group-based PA session within the MWRP. Despite good intervention adherence, intensive educational programmes do not appear to effect significant benefits in relation to PA levels or weight (Holt et al., 2018). This therefore indicates clinical relevance of the light intensity Walk/Run Sessions within the MWRP.

6.5.1.10 Evaluation discussion

It is important to stress that while earlier sections (Chapter 2 and Chapter 3), have highlighted the applicability of the PRACTIS (Koorts et al., 2018) for evaluating the this modified EBCD approach and the implementation of the MRWP together, the current research does not lend itself to an evaluation of the MWRP implementation, as this is not within the scope of the current research. Therefore, the application of the PRACTIS in this project should be used to evaluate a pilot implementation of the MWRP. Due to time and logistical constraints within the project, summative interviews with individual participants were not utilised for process evaluation purposes as advocated for (Bate & Robert, 2007). In place of this, all participants that had participated in and contributed to the project were invited to attend a final session based in order to conduct a brief process evaluation of the EBCD project using a focus group format it is likely that the already formed group dynamic may have had some positive influence on issued raised during this evaluation process. Participants that participated in the evaluation focus group had all participated in the four stages of co-design process. As such participants took part in a process that is designed to bring participants together and facilitate participants through a process that is inherently designed to resolve power differentials in the room as per contact theory (Pettigrew & Tropp, 2006). Therefore, it is postulated that the group formation which occurred during the course of the EBCD process did not lend itself for participants to point criticism at the process easily. Lastly, the evaluation process did not include a cost analysis as an outcome measure

6.7 Limitations of Study 3

This section outlines limitations to the research which occurred during Study 3. Only four MH service providers participated in the co-design stages of the research. Traditional EBCD is inherently multi-stakeholder participatory in its ethos and design throughout all stages of the process (Palmer et al., 2018; Robert, 2013). In this current research, initial 'gathering experiences' (Study 2) demonstrate relative success in achieving a diverse multi-stakeholder sample, including a prescribing doctor, and carers. In Study 3, while some hard-to-reach participants were included, no participants were family or carer, and this is thought to be a limitation to the EBCD process. As mentioned, ethical restrictions on this research, specifically with regard to the use of the narrative trigger film, likely impacted on the potential impact of this approach despite the novel use of Actors portrayals.

This research also utilised an external person to facilitate co-design sessions during Session 1 and Session 2. However, this method was abandoned at Session 3 as it was apparent that using an outside researcher that was not familiar with the context of the local MH facilities environment was unable to facilitate the co-design working groups appropriately. The lead researcher was then placed in their stead at Session 3 and the impact of the initial stunted sessions was minimised.

6.8 Chapter reflection

This section deals specifically with the researcher's reflections on the co-design undertaken to develop the MWRP. There are a number of key moments and issues that took place during the four co-design sessions and in subsequent stages of research that led to the co-design work and the brief evaluation session which require reflection, as they undoubtedly influenced the direction of the research.

Prior to commencing Study 2 and Study 3, the researcher attended EBCD training with Prof. Glen Robert (Health Care Innovation, Kings College London) organised by the Point of Care Foundation, London. This training served as a valuable opportunity to gain insights into delivering an EBCD project in practice. Moreover, this presented an opportunity to discuss perceived logistical challenges and incorporate others experience of carrying out EBCD in diverse health care setting. This included insights into the modification of EBCD which was used in the current EBCD project. For example, the ethical challenges of filming patients in this current research study were discussed at length at this training.

Close observation methods used during Study 1 were shown to be effective for a number of reasons throughout the EBCD process. First, it provided the researcher with context of the activities that are typically engaged with during care. For participants of co-design work, 'close observation' would potentially allowed anxious participants an opportunity to recognise the researchers, minimising any adjustment that would have otherwise taken place during co-design sessions.

A defining feature of EBCD is the use of the trigger film (Bate & Robert, 2007). The value of the narrative trigger film is seen as a defining valuable feature of EBCD approaches. With this considered, it was deemed necessary to incorporate some form of narrative trigger film in its stead. Adopting the professional actor to portray service user participants proved successful in generating discussion and providing a reference for emotional mapping work. Despite this, it is likely that darkening the face of the actor to indicate anonymity reduced the authenticity associated with seeing emotion and learning of experience. This may have impacted the value of outcomes at during the trigger film co-design session. Going forward a recommendation based on this is a concerted effort with research ethics committees to utilise EBCD trigger films.

During four co-design sessions and subsequent evaluation work, it was noted the extent to which the facilitator (Session 1 and 2: External, Session 3 and 4: Researcher) had to challenge power differentials among the co-design group. This phenomenon provided an additional impetus for removing the external facilitator from the process after session 2. It must be stated that these power-differentials were not observed to be sinister in any way. But rather, these differentials reflected a culture of reliance on the MH service providers from the MH service users. Future efforts to utilise an EBCD approach in this manner should consider this challenge. Previous authors have recommended training as a means to empowering service user participants to enhance engagement with the co-design process. Based on the current research, an argument is put forward which advocates that responsibility in this regards should be that of the experienced facilitator instead.

Chapter 7

Thesis discussion

Chapter 7: Thesis discussion

7.0 Section introduction

PA programmes have a place in contemporary rehabilitation MH services for physical health improvement and the growing evidence to show improvements in clinical recovery. This research project has consistently related PA back to three prevailing and differing, but relatable concepts of recovery during mental illness. These are: clinical recovery, journeyed recovery, and a recovery approach to care (Health Service Executive, 2018; Higgins & McBennett, 2007). Chapter 2, Section 1 of this doctoral thesis provides the rationale for the inclusion of PA as a therapeutic tool for clinical recovery, demonstrating value to physical and MH of people with SMI many ways. Among people with SMI, high rates of physical comorbidity have been documented as a clinical and treatment priority for MH services internationally (De Hert et al., 2011; Vancampfort, Stubbs, et al., 2015). Rehabilitation and recovery MH service users in Ireland, which typically have SMI diagnoses of SZ, BPD, MDD or comorbid SMI and are placed in rehabilitation and recovery if they have complex needs or treatment resistance, and are therefore among the most vulnerable of MH service users in Ireland (Lavelle et al., 2007). There is currently little or no empirical research on the comorbidity status of people with SMI, particularly those in rehabilitation and recovery MH care in Ireland (Nash et al., 2015). In this current research, Study 1 (Chapter 4) provides an indication, based on self-report data in relation to the extent of comorbidity within the sample of 105 people with SMI in rehabilitation MH care. In this current research, almost half (48%) of the sample reported at least one physical comorbidity, demonstrating a likely vast expanse of poor physical health within rehabilitation and recovery MH service users in Ireland.

People with SMI have poor rates of PA guidelines adherence and are characteristically sedentary (Vancampfort, Firth, et al., 2017). Study 1(A) shows that people with SMI in Ireland likely have deleterious PA behaviours, with up 70% not meeting NPAG. While we acknowledge here that Sports Monitor Report in Ireland shows comparable figures among the general population (ipsos-MRBI, 2017), we are nonetheless concerned considering the particular vulnerability of the population. In addition, accelerometery research in the subsequent Study 1(B) has shown that participants from rehabilitation and recovery services can be characterised by prolonged SB (73% of their time). Physical activity engaged with is predominantly light intensity PA, with only 5% of wear-time spent in moderate PA. This finding is reflected in a number of studies showing that outpatient and community dwelling people with SMI typically rely on walking as a predominant type of PA (Carpiniello et al., 2013; Ussher et al., 2007). By looking to the OBM data collected in this research, the picture presented is more clear and still concerning. There appears a need for services to promote and support more moderate and vigorous PA.

Study 1 also provides a comprehensive and in-depth picture of the nuanced factors that influence PA for people with SMI. Study 2 provides a more exploratory dive into the experiences of PA within rehabilitation MH services from a multi-stakeholder perspective. The findings from Study 1 in this regard contribute to a body of knowledge on the factors that influences PA, be they intrapersonal, interpersonal, community, environmental or policy levels influences on PA, showing where less active people with SMI experience heightened barriers to PA. Study 2 contributes a multidisciplinary and transdiagnostic exploratory qualitative study that is phenomenologically informed, therefore building on a growing body of research interested in using interpretivist methods to understand how PA impacts abstract concepts such as the journeyed recovery. Study 2 also provides deep dive experiences of the challenges associated with being PA while having a MH diagnosis is experienced (Hargreaves et al., 2017; Pickard et al., 2017).

At present, findings from this research, specifically Study 2 (Chapter 5), shows similarities to key findings that arose in the critical review of qualitative research on the experiences of PA in MH care from the perspectives of multiple stakeholders (Section 2.5). This indicates that those with SMI rely considerably on MH service providers in seeking support to engage with PA programmes that are specific to their needs. The value of intensive social support from service providers, be they exercise professionals or more traditional MH professionals has been alluded to within quantitative research, where inpatients in some research, have high rates of PA and low levels of SB (Fraser et al., 2015).

Much literature points to inpatient MH service users having greater amounts of MVPA compared to outpatient. In the current research, all participants were from outpatient rehabilitation and recovery services. These individuals with SMI who are community dwelling or in low support residential facilities appear to achieve higher amounts of light intensity PA than those in high support services (an indication of illness severity or acuity). While it is not entirely clear as to why this is the case in the current research, qualitative research that has looked at environmental factors that influence PA show that high support settings can be often restrictive of PA behaviours due to regulations and policy (Faulkner et al. 2009; Gorczynski et al. 2013). In Study 2 of this current research, qualitative findings appear to also indicate that many rehabilitation and recovery orientated services may also have restrictive environments on PA in many respects. However, in this case, it appears that this phenomenon is intertwined with organisational and cultural norms which are likely to be stigmatising for MH service users. Experience-based Co-design as a process puts forward a model that is participatory and inclusive of services users, with emphasis on equalising power relations between stakeholders (Roberts, 2013). Not surprisingly, the MWRP, which has been developed on the back of the modified EBCD approach, takes much from the co-design structure in so far as it is group orientated and co-delivered. These concepts, if implemented and upheld as intended by the co-design team should have the capacity to level power relations that may exist in a group formed under the MWRP. In this regard the MWRP is designed specifically with the view of minimising between-stakeholder stigma, as was identified during Study 2.

Whilst these environments are shown to be restrictive in many respects, there appears to also be a paradox at play. It seems service users that are more advanced in their recovery journey, face a much more challenging milieu in the context of maintaining PA and reducing sedentary behaviour as was discovered in qualitative research carried out in Study 2 (Chapter 5). Mental health service providers discussed a greater autonomy afforded to more 'stable' MH service users with SMI. In this research, it seems that this greater level of autonomy poses too great a climb-down in social support from MH service providers in the context of supporting PA, which has been implicated in a number of negative experiences of PA, related to lack of support and amotivation. The paradox with this issue is that research evidence would suggest that increased PA is associated with increased autonomous regulation in SMI populations, which in some respects is an indication of recovery progression; that is, the more well a person becomes, the greater their capacity for PA (Vancampfort, De Hert, et al., 2013; Vancampfort, Moens, et al., 2016). Findings from Study 2 in the current research suggest that in the Irish contexts this appears to not be the case. In looking at how studies in this doctoral thesis link to develop the MWRP, the concept of social support is perhaps the most standout example. For instance, in Study 1(A), social support was identified to be an area where strong barriers to PA exist among more active people with SMI in Ireland. In Study 2, an exploration of this phenomenon provided a possible explanation for what appeared to be a paradoxical issue. It seemed that younger more active MH services users must at time pursue PA in community settings, as MH services do not have capacity to support these more advanced needs with respect to higher levels of PA. In doing this, service users appear to experience a withdrawal of social support from their primary support network of MH service providers, as shown in (Soundy et al. 2014). With this new understanding brought forward to Study 3 (co-design), a clear system of social support, in addition to bridging connections to community-based PA has been built into the MWRP to overcome this challenge on being physically active in recovery.

Mental health services in Ireland are mandated with delivering recovery orientated MH services (Department of Health and Children, 2006). To adequately deliver on this, services must adopt a service user centric approach to care, adopt a co-production approach to service delivery and development, and be supportive of recovery learning and practice (Health Service Executive, 2018). A robust body of evidence now exists to use structured PA as a routine therapeutic tool that can ameliorate certain psychiatric symptomology across some diagnoses of SMI (Firth et al., 2015; Schuch et al., 2016). Such recommendations are grounded in trial and intervention based research that have demonstrated efficacy of PA in relation to improving physical health for people with SZ (Daumit et al., 2013), improving symptoms of depression among people with depressive disorders (Hallgren et al., 2016; Hallgren et al., 2015). Successful exercise trials, which have traditionally focused on weight-loss as a primary outcome measure have also utilised intensive dietary (Green et al., 2015), and motivation components (Curtis et al., 2016). Non-randomised trials in people with SZ indicate that sustained psychosocial support post intervention may be necessary to maintain levels of PA among participants post intervention (Firth, Carney, et al., 2018). This point draws links to the translational gap that exists within lifestyle behaviour research and people with SMI (Deenik et al., 2019; Rebar & Taylor, 2017), which has been discussed in greater detail in Chapter 2, Section 2.6.8.

To address this translations gap, the *Move with Recovery* Programme (MWRP) has been developed as a result of a multi-study modified EBCD process. This MWRP has the primary aim to support people in rehabilitation and recovery services to increase their levels of PA and reduce their SB by (i) introducing participants of the MWRP to PA and exercise, (ii) provide a group-based programme that is informative and motivational for PA, (iii) provide an ongoing group-based programme that MRWP participants may return to where additional support is required, (iv) develop and signpost pathways for participants to take autonomous ownership of PA.

In the current research, the modification, based on the implementation science framework, the PRACTIS (Koorts et al., 2018) of the EBCD approach, was undertaken to develop a viable approach for integrating PA into existing rehabilitation and recovery focused MH services for people with SMI. This research project had the primary outcome of developing the MWRP. The MWRP offers a programme for MH service stakeholders to follow in delivering and providing PA through a new paradigm that is aligned with recovery orientated care and shaped by implementation framework. In doing so, the MWRP is positioned within a paradigm that aims to challenge the outgrown status-quo of delivering PA or exercise interventions through didactic and passive means, which are believed to be responsible for the ‘translational gap’ between lifestyle interventions and real world clinical practice (Rebar & Taylor, 2017).

7.1 Thesis reflections

During the course of carrying out this doctoral research, a number of internal and external factors impacted in part on the success and limitations of the research. During Study 1 (A) and during Study 2 stages of data collection, a considerable number of psychiatric nurses within the Psychiatric Nurses Association, were on a work-to rule protocol industrial action against the Health Service Executive. During Study 1 (A) a number of psychiatric nurses provided a gatekeeper role for MH facilities where samples were accessed. In Study 2, psychiatric nurses acted as gatekeepers in some instances, but also served as a population for sampling. While many individual nurses personally extended themselves to support the research e.g. providing their personal telephone number to arrange interview dates etc.; this still impacted on the levels of engagement among nurses during some phases of the research. This research benefited enormously from the consistent and dedicated buy-in and support from MH service providers at each site location across Study 1, 2 and 3. Service providers consistently supported and facilitated the research being carried out through their service. In many respects, this positivity towards the research was seen to reflect a desire to enhance PA provision within the existing services.

During Study 2, participants were required to have a third-party co-signature on all consent forms, as per the request of Research Ethics Committees that oversaw this project. It is notable that as of 2018 European data protection regulations, this would no longer be the case. It would be therefore pertinent for future researchers in this area to have received appropriate training in identifying vulnerable participants that may experience such symptoms as persecutory delusions.

During the project conception and needs analysis stage of this research project (See Chapter 1), multidisciplinary rehabilitation and recovery MH teams across the SECH region were met to plan the research design and data collection procedures. At this point, face-to face meetings were carried out with three separate multidisciplinary rehabilitation and recovery MH teams, in addition to the Mental Health Executive for SECH region. Two of the multidisciplinary teams that were met provided comprehensive and ongoing support for research project. Such support also came with the stipulation that research findings would be presented to multidisciplinary teams at appropriate intervals to help inform practice. However, in one of the locations where the multidisciplinary team was met, service level support from the multidisciplinary team was less forthcoming. As a result, a comparatively smaller sample was accessed from this region in Study 1. Moreover, this region was not included in Study 2 where the objectives of the study required the inclusion of only areas within the region. A number of focal points that occurred during the course of the research enhanced the researcher's learning and experience, and therefore inspired project development. First, the researcher attended a three-day qualitative skills course in the School of Nursing, Dublin City University. This course focused on semi structured interviewing and the use of photo-elicitation during research interviews with vulnerable research participants. Following this course, it was decided that this methodology would be integrated into Study 2 of this current research as a useful approach to overcome communication challenges seen in other qualitative research with people that have SMI.

The researcher also attended EBCD training with the Point of Care Foundation in London (See Chapter 5, Section 5.7 for more detail on this training). This training allowed the researcher to network with other researchers working in the EBCD space providing learning in relation to large EBCD project management. Experience-based Co-design projects are uniquely complex and fraught with barriers to successful completion due to their multi-stakeholder inclusiveness and aims to highlight challenges to the status quo for service development. Attending this training allowed the researcher to grow with respect to overcoming these issues.

The researcher also attended recovery-based workshops organised by Advancing Recovery in Ireland. These workshops focused on MH learning, group facilitation, co-delivery programmes among other topics. Engagement with this enhanced the researchers learning with respect to group facilitation which was an essential skill necessary for the completion of the co-design work of Study 3.

Aside from the more structured learning pathways outlined above, this project afforded the researcher to develop in a number of areas with respect to early career research. For instance, this researcher begun this project from a background of exercise and sports science, and so this was the first time the researcher had come in to contact with MH services in any regard. Evidently, the research process brought about a detailed learning of MH care and mental illness generally through critical appraisal of the literature, attending health and psychiatry conferences and spending time embedded within MH services interacting and participating in the daily routines of multiple services.

The varying level of support between services shown during these data collection stages of the research had meaningfulness beyond mere logistics of data collection. For instance, where this support was forthcoming, the researcher was afforded an open and welcoming service, where interaction and active participation in activities with service users was encouraged as per recovery focused MH care. This allowed the researcher more opportunity to learn about mental illness and MH care service delivery through social interaction. In addition to this, time spent embedded within services fostered understanding of the complexities of research with vulnerable populations. Moreover, there are inherent challenges with bringing an external research agenda into diverse therapeutic sites. This process allowed provided steep learning for the researcher in managing health care expectations and existing power dynamics within services. In many cases, the researcher spent time interacting and engaging with routine practices which allowed for the development of a rapport with many service users and service providers. In this regard, this research demonstrated how some services operating in the region are taking steps to make services open and community focused as per recovery approaches to care. In many other ways, this research process illuminated that the challenge of active openness within a service is testament to the breath of underlying stigma that remain for people that use MH services.

This research was funded by HSE services and so from the outset, this research was service development focused which added some challenges to the research journey from which there is learning. As outlined in Chapter 1, needs analysis processes resulted in this research giving focus to rehabilitation and recovery MH services. In Ireland rehabilitation and recovery services is very diverse setting with regard to age, diagnoses, behavioural patterns and illness acuity. In this regard, the initial stages of this project were challenging for the researcher to ascertain context with respect to the population of interest. A recommendation going forward for future researchers in this field is for more structured ethnographic approaches to inquiry where time has been specifically allocated towards this learning. While informal time embedded with services during data collection has been discussed already as a positive learning for the researcher, it must also be acknowledged that the researcher was time limited during this process due to the large number of rehabilitation and recovery sites operating across the region. In this way a more formal approach to observation would have allowed for designated time spent with each facility.

In addition to the various trainings attended, the researcher also spent a 1-month sabbatical with the School of Psychiatry, University of New South Wales, Australia. During this time, the researcher presented the modified EBCD process at the Society for Mental Health Researchers Conference, Canberra, 2017, in addition to delivering an address on the picture of PA provided within Irish MH services at the SIMPAQ International stakeholders meeting in Sydney. This trip afforded the researcher opportunities to develop and learn about integrated lifestyle intervention by being integrated with the UNSW team based in Bondi Community Health centre, in addition to visiting key sites to view and discuss examples of good practice integrated PA as part of routine care. The researcher visited community and outpatient programmes in the Bondi Centre (Keeping the Body in Mind) and programmes run with inpatients in Saint John of Gods Hospital, Richmond.

The researcher has begun to take new learnings from the research journey to actively lobby MH service reform in Ireland. For example, in June 2018 the researcher organised a conference for MH clinicians in Ireland to learn about developments in the field of integrated PA and SB interventions for clinical practice. Drawing on support of academic partnerships (Prof Simon Rosenbaum and Dr Wolfgang Ruf), the researcher brought together clinical persons and policy makers in Ireland to learn about the current best practice standard.

7.2 Recommendations

In this section, overall recommendations that arose during the three main studies of the current research project that were carried out, in addition to the critical review of literature are outlined. The recommendations have been made in relation to Research, Clinical practice, and Education. The reader will note that many of the recommendations overlap and relate to one another in many respects. This will be flagged where this has happened.

7.2.1 Recommendations for practice

Recommendation 1: Subject to piloting and evaluative research, the *Move with Recovery Programme* (MWRP) should be subject to scale-up for other Recovery Colleges nationally and internationally.

The evaluation study carried out during Study 3 (Section 5.7), although not without limitation, demonstrates that the EBCD utilised to develop the MWRP has been developed with consideration of the PRACTIS guide which improves the programme suitability for implementation into clinical settings and its capacity for wider roll-out scale-up. This research recommends that future work be undertaken to pilot the MWRP in a local Recovery College, comparing outcome measures against a control group from a recovery college in a different region where the MWRP is not available to participants. Such pilot research should consider a range of outcome measures including but not limited to: PA levels, CRF, SB, MH outcomes and anthropometry. It would also be pertinent for qualitative research to be conducted in this sense to explore barriers, facilitators to the MWRP in addition to concepts such as social connectedness, which underpin the aims and structure of the MWRP.

Recommendation 2: The need for integrated PA and SB resources in the treatment of everyone accessing rehabilitation and recovery MH care.

Ireland has been slow to integrate PA as a primary therapeutic endeavour. In Australia, the MH policy, which incorporates the role of the accredited exercise professional within multidisciplinary MH teams appears to be an approach to integrated PA that is acceptable (Lederman et al., 2016), and effective in many respects (Curtis et al., 2016). Reflecting such an approach in an Irish setting could potentially allow for a number of the recommendations for practice (shown here) to be implemented. This research is actively seeking to develop a role in this regard. Two grant applications have been recently submitted, to *The Slainte Care Integration Fund* and *The Service Reform Fund* for a pilot project to develop the role of an integrated exercise practitioner (Applicants: Ronan, Lowney, Matthews, Kissane, Cowman, and Denieffe).

Recommendation 3: Routine monitoring of PA and SB in all Irish MH care

Within the literature, physical inactivity and SB are shown to be independently associated with a number of risk factors for cardiometabolic dysregulation among people with SMI. In addition, persons with SMI that are active beyond the NPAG through PA interventions may improve their MH in a number of ways that are beneficial to clinical and journeyed recovery. The most up- to date guidance for MH services staff in Ireland (Let’s get active resource) recommends the use of outcome measures to monitor progress (Broderick & Moran, 2018). The resource guides MH service providers through web links to a number of PA and SB questionnaires for their use in practice. Yet, at this point in time there is poor consensus in relation to appropriate PA and SB measurement tools for this population. In this way, work is required to make MH service providers aware of the limitations of such tools, so that more nuanced PA and SB may be tracked in the absence of well validated measures.

Furthermore, while aligning with *Recommendation 2* (above), it seems logical that future updated versions of the *Let's Get Active* document look to advocate for routine clinical measurement of PA and SB using a single measurement tool where there is consensus in relation to validation and reliability for both PA and SB. Arguably, at present, the IPAQ is best positioned to fulfil this role. However, the SIMPAQ tool has been developed with the intention of use specifically for an SMI population, and so clinical guidelines should consider this going forward where validation is satisfactory (Rosenbaum et al., 2019).

Recommendation 4: Rehabilitation and recovery MH services should address multilevel factors that enable SB.

Study 1 (B) of this research project highlighted high levels of SB among volunteer participants independent of acceptable levels of PA with respect to PA guidelines. This research did not specifically isolate a cause and effect in relation to this high level of SB. However, the SEM which frames this research, in addition to qualitative findings explored during Study 2, would suggest that sedentary routines within rehabilitation and recovery MH service facilities is due to a complex array of factors that influence behaviour from the intrapersonal level, interpersonal level, organisation and community level, policy level and physical environment level. Taking this into consideration, a number of factors highlighted may be modifiable to enhance the daily routines of people with SMI in supported facilities to be more physically active.

Recommendation 5: Experience-based Co-design may be used within local MH service to develop PA provision within local MH services that are context specific.

In a MH context, EBCD offers an approach which helps different cohorts and disciplines understand differing perspectives (Larkin et al., 2015). In doing so, this may help to reach and address challenging and complex needs of vulnerable people with SMI. For example, previous research using EBCD with older adults has shown how service providers may often act in a defensive manner to emotional mapping exercises. However, in EBCD, patients are facilitated to share narratives in order to develop empathy and understanding within the group. In this example of an EBCD project with older adults, facilitated co-design sessions appear an effective approach for developing this inter-group understanding and empathy (Bowen et al., 2010).

7.2.2 Recommendations for research

This research utilised a modified EBCD approach in developing PA and SB provision in MH settings. Through carrying out this process, a number of recommendations for research have emerged.

Recommendation 6: There is a need for an updated published review of the qualitative literature on PA and transdiagnostic SMI.

A number of prominent review articles in this field which have been discussed within Chapter 2, Section 2 of this research project are aged in the context of the current research. These include (Mason & Holt, 2012; Roberts & Bailey, 2011; Soundy et al., 2014). Of the more recent of these review studies, the work of Mason & Holt (2012) focuses specifically on qualitative inquiry on intervention research and did not include the perspectives of other multidisciplinary persons. In Soundy *et al.* (2014) the review question focused specifically on diagnoses of SZ and did not account for the experiences of other SMI diagnosis. The combined limitations of these, in the context of the broader field of literature leaves room for an updated research. In pursuing this, it seems meta-ethnography methodologies as per Grant & Booth (2009) may be appropriate for providing an up-to date synthesis of the qualitative research in this field. In doing so, future research may be adequately guided to address the gaps that exist within qualitative research and PA for SMI populations.

Recommendation 7: There is a need for a more widespread use of Social Ecological Models in PA research with SMI populations.

Physical activity motivation and education interventions which have framed interventions in behavioural theories such the Self-efficacy theory and Self-regulation theories are shown to be ineffective (Holt et al., 2018). It could be argued that such behavioural theories are too compartmentalised in their consideration of factors which influence behaviour and should therefore be addressed in behaviour change intervention (Buchan et al., 2012). There is good evidence from existing qualitative research indicating strong interpersonal and environmental factors of influence on PA behaviours of people with SMI in rehabilitation contexts (Gorczynski et al., 2013). In addition, advances in the field of practice have shown vast policy differences between some international contexts, such as the inclusion of accredited exercise professionals in some in some settings (Lederman et al., 2017). These new developments are likely to have influence over PA levels for people with SMI between settings. To date, the literature has not uncovered the role that policy level factors play in influencing PA (Vancampfort, Correll, et al., 2013; Vancampfort, Knapen, et al., 2012).

Recommendation 8: The *Move with Recovery Programme* should be subject to piloting trial in a controlled trial.

While the EBCD process shown in this research would suggest that the MWRP has been developed in an evidence-based manner. The completed programme should be subject to a controlled trial piloting, using a sample from a separate recovery college in a comparable context. In doing so a number of considerations should be made. First, such research should ideally be led by a third level institute as opposed to being internally conducted within HSE services to ensure that appropriate PA epidemiological research methodology can be undertaken. Furthermore, as per the literature laid out in Chapter 2 of this research project, outcome measure should seek to focus on PA and SB as primary outcome measures (Ashdown-Franks et al., 2018), and MH and physical health markers as secondary to such. The MWRP has also been developed within a structure that is focused on sustainability. Intervention research in relation to PA and SMI have typically been the subject of short term measurement in research (<12 months), and as such limited data is available in relation to factors that may sustain behaviour change and changes in outcome measures more long term (Firth et al., 2015). Therefore, pilot testing of the MWRP should include a >12 month follow-up data collection to examine programme sustainability.

Recommendation 9: The MWRP pilot should be subject to an implementation evaluation.

As previously discussed the PRACTIS framework should be utilised in evaluating the MWRP in a clinical setting to determine implementation effectiveness (Proctor et al., 2011).

Recommendation 10: There is need for a greater focus on participatory research and implementation based evaluations in the field of PA and SMI.

This concept has been well highlighted in recent articles that have been discussed in Chapter 2, Section 2.4.1. Here, the translational pitfalls between interventional research and clinical practice have been well documented. The current research study, in addition to other recent participatory research approaches, such as that of Wheeler *et al.* (2018) may offer PA interventions which are more feasible and acceptable for people with SMI than interventions that are borne out of trial-based research. In this regard, this specific approach and similar approaches are in their infancy, and therefore require robust implementation evaluations going forward.

Recommendation 11: There is need for a greater inclusion of carers/family, PSWs and Occupational therapists in PA research with SMI populations.

The use of PSW as adjunct care providers in MH services is a powerful reflection of a recovery focused MH service (Davidson et al., 2006; Pitt et al., 2013). Reflecting the prominence of PSW within recovery focused MH services, there are increasing examples where PSW have played a fundamental role in the implementation of PA intervention, and with good effect (Stubbs, Williams, Shannon, et al., 2016).

7.2.3 Recommendations for education

Recommendation 12: Mental health service providers should have more accessible information and training on PA made available to them by updating the existing *Let’s Get Active Guidelines.*

Findings from Study 2 (Chapter 4) of this research suggest that MH service users with a SMI in rehabilitation and recovery services are limited in their opportunity to engage with PA on account of some practices which are stigmatising in a sense. The findings within this study suggest that such practices are not reflective of a particular policy or guidance, but are instead ingrained cultural phenomena.

While the recent guidance for Irish MH policy are welcomed in such a policy vacuum (Broderick & Moran, 2018), it is a recommendation of this research project that future or updated versions of guidance such as that of Broderick and Moran (2018) challenge this cultural practices and norms explicitly. While the importance of risk minimisation should not be overlooked, this should not be at the cost of excessive SB. In this regard, disrupting sedentary behaviour should be encouraged by MH service providers and service users with SMI are to be encouraged to initiate PA under their own volition. Moreover, weight-gain and associated comorbid states, should remain a priority concern for MH services. However, MH service providers should receive updated training with respect to the limitations of the use of PA for carrying out weight loss interventions. Instead, service providers should receive training in using PA as a therapeutic resource to foster clinical and journeyed recovery.

7.3 Thesis contribution

This research project has made a number of contributions to the field which have ramifications for practice and for research. This is the first example of a complete use of an EBCD approach to develop a PA resource that may assist MH services in providing regular and sustainable PA for people with SMI. As discussed in previous sections, there is an emergence of research that has utilised ‘participatory methods’, but none have yet utilised the EBCD approach, including trigger films and design prototyping. In addition to this, EBCD has not previously been utilised in this fashion in other research. However, the novel modification and application of EBCD here appears to align directly with the service inclusion discourse which is inherent within recovery models of care.

Moreover, our specific approach to EBCD, which adopted a number of modifications to meet methodological and ethical requirements, gives rise to learning for new research in this regard. For instance, this research gives a pathway for new research to use trained actors to re-create service user interviews where ethical restrictions preclude the direct filming of service user participants.

In addition to the above, the outcome of the EBCD process, which is the MWRP, presents a novel development for Irish MH care, in that it seeks to overcome the current policy void that exists, by connecting MH service users with PA opportunities in their community. However, unlike many community-based PA programmes for people with SMI, the MWRP offers a support network of people that share an understanding of MH issues. The MWRP therefore links the community-based PA to local MH services. It is hoped that this would, in time, connect other, less active people with SMI to community-based PA, but with the support connection of the MH services still in place.

This research presents the first Irish data to comprehensively measure PA levels, SB and factors that influence PA using SRQs and OBM among people with SMI. This gives provides useful information for policy makers in terms of developing PA programme that are context specific in the future. At the same time, this research has highlighted the nuanced PA and SBs of people with SMI in Ireland, showing high levels of SB and low levels of MVPA. These findings should prompt a change in MH policy at a national and local level.

This research presents the first multi-stakeholder research that has utilised exploratory, interpretivist phenomenologically informed inquiry to understand experiences of PA and care for SMI. Moreover, there is a gap in the current research base which has accessed both PSW and carers. This research has addressed this deficiency within the methodology utilised. Lastly, this research adds to the growing adoption of the SEM in PA and SMI research. In doing so, the field of knowledge is expanding to appreciate the importance of policy, physical environment levels of influence on PA and SMI.

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Appendices

Appendix 1

Research project output and publications

Matthews, E. Cowman, M. & Denieffe, S. (2018). Using Experience-based Co-design for the development of physical activity provision in non-acute rehabilitation and recovery mental health care. *J Psychiatr Ment Health Nurs. 24*(7) DOI: 10.1111/jpm.12401

Matthews, E. Cowman, M. & Denieffe. S. (2018). Calling for a change in Irish mental health care strategy for cohesive physical activity and sedentary behaviour inclusion. *Irish Journal of Psychological Medicine. 1-3.* DOI:10.1017/ipm.2018.38

Matthews, E. Cowman, M. Brannigan, M. Sloan, D. Ward, P.B. Denieffe. S. (2018). Physical activity and the barriers to physical activity between active and inactive people with severe mental illness in Ireland. *Mental Health and Physical Activity, 15,* 139-144. https://doi.org/10.1016/j.mhpa.2018.10.003

Rosenbaum, S. Morrell, R. Abdel-Baki, A. Ahmadpanah, M. Anilkumar, T.V. Baie, I. Bauman, A. … **Matthews, E.** … Ward, P.B. Assessing physical activity in people with mental illness: 23-country reliability and validity of the Simple Physical Activity Questionnaire (SIMPAQ). *BMC Psychiatry (*Under review).

Relevant project output (other)

Oral Presentation: **Matthews, E.** Cowman, M. Brannigan, M. Sloan, D & Denieffe, S. The physical activity levels and the examination of barriers to physical activity between active and inactive people with severe mental illness in Ireland. *University Hospital Waterford Research Meeting, Waterford.* *Best oral presentation.

Oral presentation: **Matthews, E**. Cowman, M. Brannigan, M. Sloan, D. & Denieffe, S. The physical activity behaviours of people with severe and enduring mental illness in Ireland. *All Ireland Postgraduate Conference in Physical Activity and Sports Science, IT Carlow*. Carlow.

Poster presentation: **Matthews, E.** Cowman, M. Denieffe, and S. A multi-stakeholder exploration on the perspectives of key influencing factors on physical activity for people with severe mental illness in Ireland. *The Exercise Professionals in Mental Health Conference 2018,* Springfield MH Hospital, London.

Poster presentation: **Matthews, E.** Cowman, M. Denieffe, S. A service user centric approach to physical activity promotion for people with serious mental illness. *Faculty of Nursing & Midwifery, RCSI 36th Annual International Nursing & Midwifery Research and Education Conference 2017,* Dublin.

Poster presentation: **Matthews, E.** Cowman, M. Denieffe, S. An Experience-based Co-design approach to physical activity provision in mental health services. The Society for Mental Health Researchers, *SMHR International Conference, Canberra,* Australia.

Research in progress and future research

Matthews, E. Cowman, M. Denieffe, S. Rosenbaum, S. Stubbs, B. (2019). A systematic review of peer-supported and peer-led physical activity and sedentary behaviour interventions for people with mental health. PROSPERO Registered. Work in progress.

Matthews, E. Cowman, M. & Denieffe. S. A multidisciplinary exploration of the experience of physical activity in rehabilitation and recovery mental health settings

Matthews, E. Cowman, M. & Denieffe. S. The modification and use of Experience-based Co-design to develop a physical activity programme for people with severe mental illness.

Matthews, E. Cowman, M. & Denieffe. S. Rosenbaum, S. A checklist for carrying out co-design to develop physical activity provision for mental health consumers.

Appendix 2

Structure of mental health services in the South-East of Ireland (SECH)

CHO5 Mental Health Services

Inpatient beds

	Numbers provided
Adult Acute in Service User Beds	88
Non acute beds	115

General Adult

Community Mental Health Team	14
Day Centres	15
High Support Community Residence	19
Low/Med Community Residence	28
Day Hospitals	1

CAMHS

Child and Adolescent

CMHT	9
In Service user beds	0

POLL

Psychiatry of Later Life

In service user beds	0
Day Hospitals	0
CMHT	7
Day centres	1

Rehabilitation and Recovery

CMHT	1
High Support Residence	17
Med Support Residence	6
Low Support Residence	20
Day Centre	3

Specialist Services

Rehab and recovery Teams	4
Liaison Psychiatric Teams	1
MHID Teams	0
Respite houses	3
SCAN	2
Acute Day Services	1
Individual Placement Support Services	1

HSE Funded Regional Services

Recovery College	1
*Advocacy Services	
*Counselling in Primary Care	
*Regional Office of Suicide Prevention	
*Psychotherapy and Counselling Services	
*Self Harm Intervention Programme	
*Young People Services Committee	

Appendix 3

Summary of qualitative studies where specific PA intervention used

Source/ Paper	**Sample description**	**Data collection and schedule**	**Location of data collection**	**Specific topic cover in study/ Intervention information**	**Theoretical framework/ Research Paradigm Method of analysis /**	**Key findings**
(Browne, Mihas, & Penn, 2015)	(N=12) SMI (N=14) Mental health clinicians	Interviews and focus groups	USA	To explore client and clinician perspective and barriers to a walking group programme	Coding /Assessing inter-rater reliability (Atlas.ti software)	Themes identified: • Reasons to exercise • Barriers to exercise • Incentives to exercise
(Carless & Douglas, 2004) *Same sample research* (Carless, 2008)	(N=9)	Participant observation, Interviews and focus group	Type of SMI/patient not specified (UK)	Investigate the value of a golf intervention for people with SMI	Qualitative ethnographic case study	Themes identified that encouraged attendance and threatened attendance Narratives identified : 'Action', 'Achievement' and 'Relationship'

(Carter-Morris & Faulkner, 2003)	(N= 5) SMI Carers (N not specified)	Interviews	No detail	Football project, no detail provided.	Grounded theory	Themes identified: • Normalisation and meaningful opportunity for social interaction • Factors affecting participation • Participation challenge positive symptoms • Medication related barriers
(Crone, 2007)	(N=4) mental health service users	Interviews	People with SMI (referred) (UK)	Investigation of the experiences of people with mental health problems in a walking project.	Constant comparative analysis	Themes Identified: • Initial attitudes regarding project • Factors affecting participation • Attitudes and opinions of project • Benefits and outcomes • Experiences
(Faulkner & Biddle, 2004)	(N=3) Depression	Repeated interviews	Community mental health services (UK)	To understand the relationship between PA and psychological well-being Exercise prescription scheme in local leisure centre	Thematic content analysis	Themes identified: • Benefits of programme ○ Coping strategy ○ Distraction from negative rumination ○ Sense of accomplishment • Barriers to programme ○ Lethargy ○ Low self confidence
(Faulkner & Sparkes, 1999)	(N= 2) Schizophrenia Interviews with key workers	Repeated interviews	Supported hostel for people with mental illness that are homeless (UK).	To understand the impact of exercise on mental health 10-week supervised exercise programme.	Thematic analysis (Wolcott, 1994) Critical friend	Themes identified: • Lessens heard voices • Distraction • Improved sleeping • Improved service engagement • Social opportunity • Improved self-esteem and skill mastery

(Fogarty & Happell, 2005)	(n= 6) Schizophrenia (n= 2) Exercise physiologists (n = 4) Nurses	Focus groups	Community mental health care unit.	Determine the impact of a structured PA programme on physical and psychological wellbeing of people with SZ.	Thematic analysis	Themes identified: • The individual nature of the programme • Physical improvement • Group dynamics • Future plans
(Iwata et al., 2016)	(n= 15) people with significant mental illness • Depression • Anxiety • Dual/ D • Other	Clinical interviews (semi-structured)	Private mental health treatment hospital 13 week woodland walking (group-based) programme (2 hours/week)	Explore experiences of outdoor walking programmes.	Thematic analysis	Themes identified: • Forrest elements • Social aspects
(Khalil et al., 2012)	(n=19) Depression / Females	Focus group	Primary and Secondary MH service treatment (RCT) Low intensity rhythmic PA and psychosocial support (Groups).	Explore experiences of a tailored PA programme of low intensity PA and psychosocial support.	Framework analysis	Themes identified (intervention arm): • Feeling safe • Staying motivated and encouragement • Pacing myself • Supportive facilitated group exercise • Partner (spouse) attitude is a barrier to PA • Finance as a barrier
(Pickard et al., 2017)	(N= 5) Mental health service users with SMI	Semi structured interviews Photo-elicitation	NHS trust Community-based patients (UK).	Exploring the lived experience of exercise through existing intervention. Free exercise sessions available to participants for one year (max 10).	Phenomenology underpinned Content analysis	Themes identified: • Physical activity and mental health inseparably linked • Being ill day to day – plan to be active cannot be made • Exercise used to challenge self-image • Intermittent health breaking through clouds of illness

						• The cycle of recovery, PA needs to be flexible to meet this
(Priest, 2007)	(N= 14) Mental health service users	Participant observation Interviews Group discussion	Mental health day service (UK)	Explore mental health users experience of a walking group programme Walking group programme	Grounded theory Ethnography	Overall theme is the 'Healing Balm Effect'. Within this theme sits sub-themes: • Closer to what is more natural • Feeling safe • Being part • Striving • Getting away • Being me • Finding meaning
(Raine et al., 2002)	(N= 14) 'Gym users' with mental health service users (N= 4) Gym staff	Interviews and focus groups	Mental health service users using a community-based service (UK).	Evaluation of community-based gym to elucidate views of stakeholders regarding accessibility.	Participatory approach – Analysis of data not specified	Themes identified: • Non-institutional appearance of gym and its community-based location and its distance from MH service • Activity were meaningful and socially valued • Importance of positive relationships
(Roberts & Bailey, 2013)	(N = 8) Schizophrenia	Interviews and Observations	'Mental health service users' (UK).	Explore incentives and barriers to engaging person with SMI in a lifestyle intervention.	Ethnography Thematic analysis (Braun & Clarke, 2006)	Themes identified: *Barriers and incentives within each theme identified.* • Weight management • Social networking • Information and communication • Role of health care professional • Perceived benefit

(Searle et al., 2011) (Searle et al., 2014)	(N=19) Depression-Not taking antidepressants	Repeated interviews	GP recruitment to exercise trail/ Primary care (RCT) (UK)	1.Explore participants acceptance of and engagement with facilitated PA programmes 2.Explore views and experiences of a facilitated PA intervention PA intervention (TREAD - (Chalder et al., 2012), Supervised PA, face to face motivation support (13 contact sessions)	Grounded theory (Atlas.ti software) Self-Determination Theory	Themes identified: • Positive and supportive relationship with PA facilitator • Change of behaviour after facilitator contact • Benefits of face/face and telephone support • Fostering an autonomy supportive environment

Appendix 4

Intervention research included in critical review

Reference	Sample	Setting	Diagnoses	Mean age, years (SD)	Intervention	Statistically significant intervention group primary outcomes
(Acil et al., 2008)	30	Inpatient and outpatient	SZ	PA: 32.06 Con: 32.66	10 weeks, as 3 days in a week and 40 min/day (aerobic)	
(Aschbrenner et al., 2013)	158	Community-based MH centre	SMI	Total 45 (11.5)	Personal help provided, no details p	Increase in family face to face contact, Readiness to change associated with criticism.
(Beebe et al., 2005)	10	Outpatient	SZ	Population only: 52 years (23)	16 weeks, 3 times weekly, 30 minutes.	Significant reduction in body fat.
(Chalder et al., 2012)	361	General practice	Symptoms of depression	-	3 face to face session and 10 phone calls with PA facilitators for 8 months	No improvement in mood after PA
(Curtis et al., 2016).	16	Community services	SZ (First episode)	PA: 20 (2.3) Con: 21.7 (17)	Tailored PA programme at 60-75% VO2 peak, MVPA including RET; Peer-supported motivation; dietary intervention	Significant weight gain attenuation. Increased aerobic capacity and Self-reported PA.
(Daumit et al., 2013)	291	Outpatient rehabilitation programmes	SMI	PA: 46.6 (11.5) Con: 44.1 (11)	6 month + intensive motivation, goal setting (supervised)	Weight loss (6, 12, and 18 Months)
(Firth, Carney, et al., 2016)	28	Early intervention service	SZ (First episode)	Total: 26.96 (4.5)	10 weeks, >90 mins/ week MVPA, ‘gym sessions’ (supervised)	Initial increase in PA. PA not sustained at 6 months.
(Göhner et al., 2015)	112	Inpatient (psychosomatic rehab)	Affective disorders, neurotic and stress related disorders		MoVo process model -Behaviour Change	6 month follow level of PA increase 95 mins compared to CG

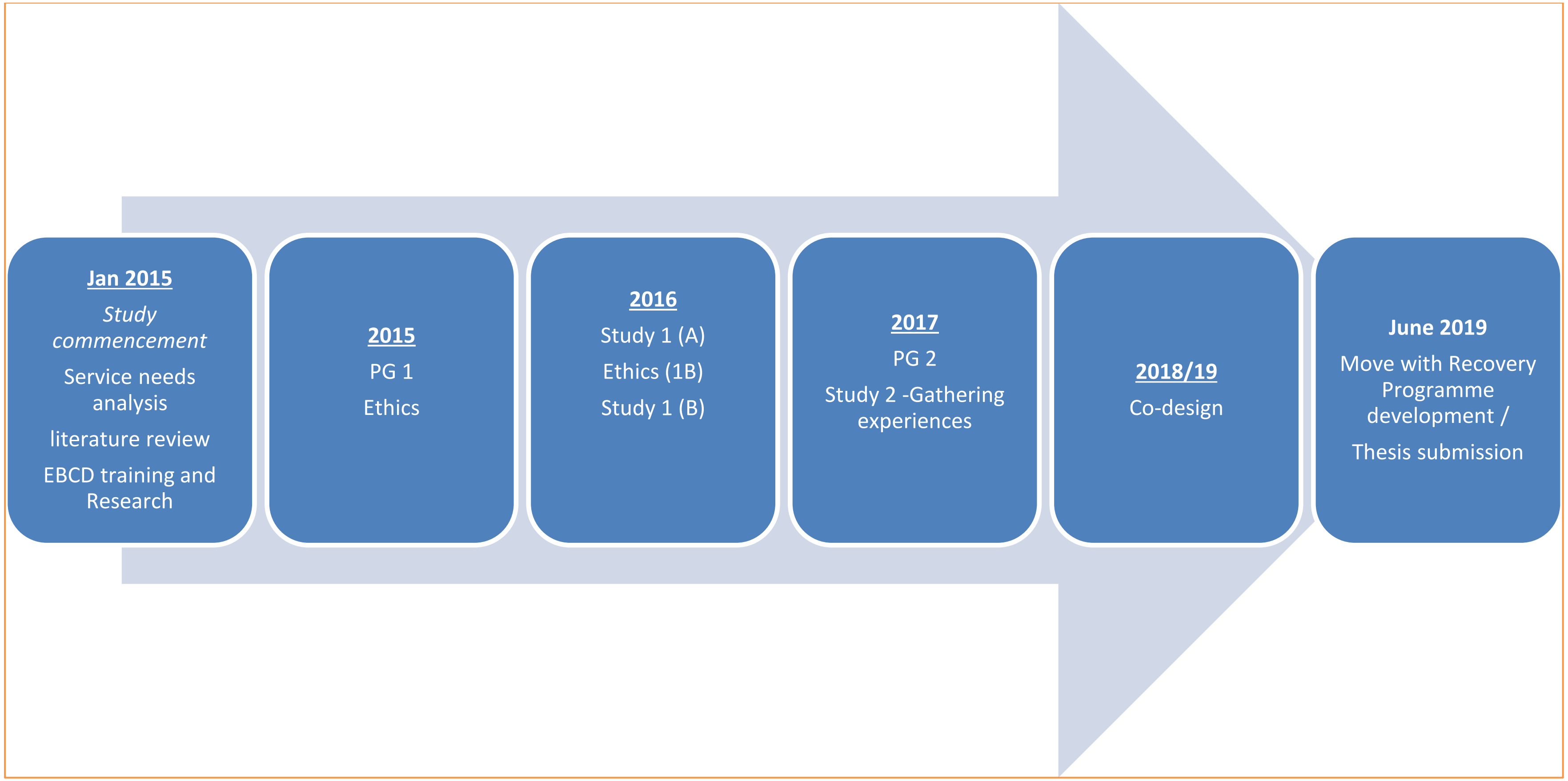
					Technique (No actual PA) Two group meetings (1hr)	
(Green et al., 2015)	200	Community MH	SMI	PA: 46.2 (11.4) Con: 48.3 (9.7)	6 months, 20 mins PA, weekly (mostly aerobic/ motivational), intensive dietary intervention	Weight loss (6 month)
(Hallgren et al., 2015).	945	Primary care	Mild / moderate depression	PA: 43 (12) TAU: 43 (12)	PA group 1: Light intensity (yoga). PA group 2: Intermediate aerobic. PA group 3: High intensity + RET 12 week , 3 sessions/week of 60 minutes (supervised)	Reduced symptoms of depression (3
(Hallgren et al., 2016).	945	Primary care	Mild / moderate depression	PA: 43 (12) TAU: 43 (12)	PA group 1: Light intensity (yoga). PA group 2: Intermediate aerobic. PA group 3: High intensity + RET 12 week , 3 sessions/week of 60 minutes (supervised)	Reduced symptoms of depression (3 and 12 months)
(Holt et al., 2018)	414	Community MH	SZ	Intervention: 40 (11.3) Control: 40.1 (11.5)	Four 150 min lifestyle education (including PA); fortnightly support contacts from facilitators; three 150 min booster lifestyle	No difference in weight between groups

					sessions at 3 month intervals.	
(O’Hara, et al., 2017)	14	Supportive housing	SMI	Population: 48.07 (16)	Peer-based lifestyle education programme; behaviour change intervention on diet and PA	Peer-based programme has good acceptability and feasibility.
(Van Citters et al., 2010).	76	Community	SMI	43.5 (11.4)	Weekly meet with health mentor Free access to fitness facility in the community	No differences between intervention
SMI = Transdiagnostic research; Con = Control group; PA = Physical activity intervention group; RET = Resistance Exercise Training; TAU = Treatment as usual						

Appendix 5

Research project trajectory since project inception

Research project trajectory since project inception



Appendix 6

Chapter 2 literature search strategies

Section 2: 2.4 *The factors that influence physical activity and sedentary behaviour*

Aspect	**Search term**
Population term	"serious mental illness" OR "severe mental illness" OR "mental disorder" OR "schizophrenia" OR "psychosis" OR "psychotic" OR "major depression" OR "depression" OR "bipolar"
Behaviour term	"physical activity" OR "exercise" OR "sedentary behaviour" OR "sedentary behaviour" OR "steps" OR "walking"
Topic term	"Barrier" OR "Facilitator" OR "Correlate" OR "Determinant" OR "Influence"

Section 2: 2.5 *Qualitative research on physical activity (Meta-ethnography of qualitative research)*

Aspect	**Search term**
Population term	"serious mental illness" OR "severe mental illness" OR "common mental disorder" OR "common mental illness" OR "schizophrenia" OR "psychosis" OR "psychotic" OR "major depression" OR "depression" OR "bipolar"
Behaviour term	"physical activity" OR "exercise" OR "sedentary behaviour" OR "sedentary behaviour" OR "steps" OR "sport" OR "walking"
Topic term	"Qualitative" OR "experiences" OR "phenomenology" OR "thematic" OR "grounded theory" "discourse analysis"

Section 2: 2.6 *Experience-based Co-design and mental health*

Aspect	**Search term**
Population term	"serious mental illness" OR "severe mental illness" OR "common mental disorder" OR "common mental illness" OR "schizophrenia" OR "psychosis" OR "psychotic" OR "major depression" OR "depression" OR "bipolar"
Topic term	"Experience-based Co-design" OR "ebcd"

Appendix 7

The 3Q Assessment of PA

1	How many times a week do you do 20 minutes or more vigorous intensity physical activity that makes you sweat or puff and pant? (e.g. heavy lifting, digging, jogging, aerobics, or fast biking)?	A. 3 or more times a week B. 1-2 times a week C. None
2	How many times a week do you usually do 30 mins or more walking? (e.g. walking from place to place, for exercise, leisure, recreation)	A. 5 or more times a week B. 3-4 times a week C. 1-2 times a week D. None
3	How many times a week do you usually do 30 mins or more moderate intensity physical activity that increases your heart rate or makes you breathe harder than normal? (e.g. carrying light loads, bicycling at a regular pace, doubles tennis)	A. 5 or more times a week B. 3-4 times a week C. 1-2 times a week D. None
Smith et al. (2005)		

Appendix 8

The Determinants of Physical Activity Questionnaire

Domain area	Itemised questions subject to Likert scoring
Knowledge	1. I know what the recommended levels of physical activity are
	2. I DO NOT know the reasons why I should be meeting the nationally recommended PA guidelines
	3. I have NOT previously read information about the current nationally recommended PA guidelines
Environmental context and resources	4. Facilities are available to help me to do physical activity
	5. There is NO WHERE to do physical activity near me
	6. My local area is NOT very attractive and this puts me off doing physical activity
Motivation and goals	7. I want to do physical activity
	8. I CANNOT be bothered to do physical activity
	9. I feel motivated to do physical activity
Beliefs about capabilities	10. I DO NOT feel confident when doing physical activity
	11. Doing physical activity makes me feel embarrassed
	12. I FIND IT HARD to do physical activity when I see others doing well at physical activity (e.g. watching others run for a long time on the treadmill)
Skills	13. I can do physical activity to a good enough standard
	14. I've NEVER really had sports skills so I DON'T do physical activity
	15. I don't seem to have the skills to keep going in physical activity sessions
Emotion	16. Daily life is too stressful for physical activity
	17. I have too many negative emotions which prevent me from doing physical activity
	18. When I think about doing physical activity, I start to worry
Social influences	19. My friends DON'T support or encourage my physical activity
	20. The people I spend my free time with don't do physical activity
	21. I DON'T have anyone to do physical activity with
Beliefs about consequences	22. If I do PA, it will benefit me in the short term (e.g. burn calories, sleep better etc.)
	23. If I do PA it will benefit me in the long term (e.g. live longer, lose weight etc.)
	24. I think physical activity will change my life for the better
Action planning	25. I tend to plan where my PA will happen (e.g. at the park, leisure centre etc.)
	26. I do not tend to plan when my PA will happen (e.g. Monday at 6pm etc.)
	27. I tend to plan how my PA will happen (e.g. how to get there, kit needed etc.)
	28. I do not tend to plan what type of PA I will do (e.g. aerobics class, walking to work, session at the gym etc.)
Coping planning	29. I know what to do in difficult situations in order to make sure I do the physical activity I have planned
	30. get easily distracted from the physical activity I have planned
	31. I always work around obstacles to physical activity; nothing really stops me
Goal conflict	32. I WOULD NOT be prepared to give up work ambitions to do physical activity
	33. I would be prepared to give up things I usually do in my leisure time for physical activity
	34. I WOULD NOT be prepared to give up spending time with my friends for physical activity

Adapted from Taylor et al. (2013).

Appendix 9

Participant Information Form: Study 1 (B)

PARTICIPANT INFORMATION SHEET

Invitation
You are invited to participate in a research study to measure physical activity of people who experience mental illness and to determine how accurate a new questionnaire is in measuring physical activity.

The study is being conducted by:

Mr Evan Matthews	Waterford Institute of Technology
Dr Suzanne Denieffe	Waterford Institute of Technology
Dr Mary Cowman	Waterford Institute of Technology
Dr Simon Rosenbaum	University of New South Wales
A/Prof Philip Ward	University of New South Wales

The study is part of a national/international collaborative study coordinated by Australian researchers.

Before you decide whether or not you wish to participate in this study, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and discuss it with others if you wish.

1. **What is the purpose of this study?**
   1. To determine how much physical activity people who experience mental illness take and what influences this.
   2. To investigate accuracy of a new questionnaire, called SIMPAQ (Simple Physical Activity Questionnaire) for determining how much physical activity people participate in. This is an important issue, as people experiencing mental illness are at high risk of being physically inactive which can contribute to weight gain and heart disease.

2. **Why have I been invited to participate in this study?**
   You are eligible to participate in this study because you access HSE mental health services in Ireland.

3. **What does participation in this study involve?**
   If you agree to participate in this study, you will then be asked to:

   1. Have your height and weight assessed (2-3 minutes).
   2. Complete a questionnaire regarding the severity of your symptoms (5 minutes)
   3. Complete a brief memory test (5 minutes)
   4. Complete a brief interview regarding your physical activity levels (SIMPAQ; 5 minutes)
   5. Wear an accelerometer (small physical activity monitor, the size of a small beeper and worn under or over clothing on the waist) for seven days during waking hours.
   6. Return to the research facility and redo the brief interview regarding your physical activity levels (SIMPAQ; 5 minutes)

If you agree to participate in this study, you will be asked to sign the Participant Consent Form.

4. **What if I don’t want to take part in this study, or if I want to withdraw later?**
Participation in this study is voluntary. It is completely up to you whether or not you participate. If you decide not to participate, it will not affect the treatment you receive now or in the future. Whatever your decision, it will not affect your relationship with the staff caring for you.

If you wish to withdraw from the study once it has started, you can do so at any time without having to give a reason. However, it is not possible to withdraw any data from the study results that have already been collected.

5. **How is this study being paid for?**
The study is being paid for by the HSE Nursing & Midwifery Planning Development (Postgraduate researcher) and departmental funds from the School of Medical Sciences, University of New South Wales (equipment).

6. **Are there risks to me in taking part in this study?**

This study has received ethical approval from The HSE South-East Research Ethics Committee and The Waterford Institute of Technology Research Ethics Committee. There no foreseeable risks from taking part in this study.

You may feel that some of the questions we ask are stressful or upsetting. If you do not wish to answer a question, you may skip it and go to the next question, or you may stop immediately. If you become upset or distressed as a result of your participation in the research project, the research team will be able to arrange for appropriate support. Any counselling or support will be provided by qualified staff who are not members of the research team. This will be provided free of charge.

The accelerometer device you are being asked to wear is compliant with International Electrotechnical Commission standards for "Type BF Applied Part" - meaning they comply with requirements for protection against electrical shock.

7. **Will I benefit from the study?**
This study aims to further medical knowledge and may improve future treatment of mental illness however it may not directly benefit you.

8. **Will taking part in this study cost me anything, and will I be paid?**
Participation in this study will not cost you anything. Participation in this research is unpaid and on a voluntary basis.

9. **How will my confidentiality be protected?**
Any identifiable information that is collected about you in connection with this study will remain confidential as best as possible and will be disclosed only with your permission, or except as required by law. This exception would occur in the case of a report, disclosure or allegation of abuse or professional misconduct. In this instance, the relevant authorities will be notified.

Only the researchers named above will have access to your details and results that will be held securely in Waterford Institute of Technology and in the University of New South Wales.

10. What happens with the results?

Results from the accelerometer will be transmitted automatically and stored on an online database that will be shared by other international researchers. All other information you provide will be de-identified and uploaded to the database.

If you give us your permission by signing the consent document, we plan to discuss/publish the results in national and international conferences and through publication in peer-reviewed journals.

In any publication, information will be provided in such a way that you cannot be identified.

11. What should I do if I want to discuss this study further before I decide?

When you have read this information, the researcher *Evan Matthews* will discuss it with you and any queries you may have. If you would like to know more at any stage, please do not hesitate to contact him on 051-302848 or evan.matthews@postgrad.wit.ie.

Thank you for taking the time to consider this study.
If you wish to take part in it, please sign the attached consent form.

This information sheet is for you to keep

Appendix 10

Accelerometer Information Form: Study 1(B)

Wearing Your Accelerometer

This device is a body worn device that measures and records physical movement associated with activity and sleep. This device is worn on the waist using one of our compatible belts. If you choose to take part, you are asked to wear the device for 7 days during waking hours. If possible, you are asked to wear the device during waking hours for as much as possible. Although the device is water resistant, we ask that you remove it for bathing etc.

How to wear the device

- Remove the clip at one end of the elastic waist belt.
- Thread the belt through the wings on each side of the device so the belt lies flat against the back side of the device.
- Replace the clip and adjust the length as needed.
- Fasten the belt snugly around the waist and position in line with the armpit, with the USB port cover facing up.

The researcher- Evan Matthews will set up the device for you and collect it from you in your day centre 7 days later.

You will receive a cleaned device. The device will be cleaned after each deployment using an alcohol-based wipe. Belts will have been laundered.

Please contact Evan if you have any questions about wearing the accelerometer or experience any unforeseen circumstances in using this device:

051-302848
evan.matthews@postgrad.wit.ie

Appendix 11

Participant Consent Form: Study 1(B)

Waterford Institute of Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

CARE
CLINICAL • ACADEMIC RESEARCH EVIDENCE

UNSW
AUSTRALIA

CONSENT FORM

[To be used in conjunction with a Participant Information Sheet]

Validation of the Simple Physical Activity Questionnaire

[Use plain English equivalent if a technical title]

1. I,..of a service user of the HSE agree to participate in the study described in the participant information statement set out above.
2. I acknowledge that I have read the participant information statement, which explains why I have been selected, the aims of the study and the nature and the possible risks of the investigation, and the statement has been explained to me to my satisfaction.
3. Before signing this consent form, I have been given the opportunity of asking any questions relating to any possible physical and mental harm I might suffer as a result of my participation and I have received satisfactory answers.
4. I understand that I can withdraw from the study at any time without prejudice to my relationship to the HSE
5. I agree that research data gathered from the results of the study may be published, provided that I cannot be identified.
6. I understand that if I have any questions relating to my participation in this research, I may contact Evan Matthews – WIT (051-302848) who will be happy to answer them.
7. I acknowledge receipt of a copy of this Consent Form and the Participant Information Statement.

Signature of participant   Please PRINT name   Date

[*or person responsible*] (*Insert or delete as necessary*)

Signature of witness	Please PRINT name	Date

Signature of investigator	Please PRINT name	Date

Validation of the Simple Physical Activity Questionnaire

REVOCATION OF CONSENT

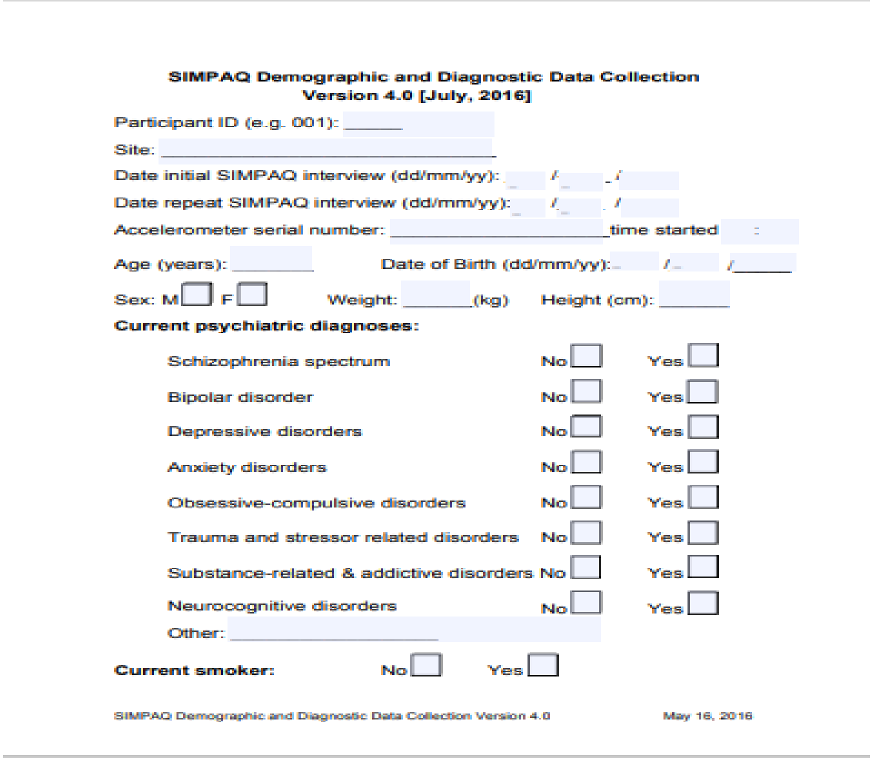
I hereby wish to **WITHDRAW** my consent to participate in the study described above and understand that such withdrawal **WILL NOT** jeopardise any treatment or my relationship with the (*HSE)*.

Signature of participant	Please PRINT name	Date

The section for Revocation of Consent should be forwarded to Evan Matthews, O' Connell Bianconi Building, Office G03, Dep Nursing & Health Care, WIT, Waterford.

Appendix 12

SIMPAQ demographic form



SIMPAQ Demographic and Diagnostic Data Collection
Version 4.0 [July, 2016]

Participant ID (e.g. 001): ______

Site: ________________________________

Date initial SIMPAQ interview (dd/mm/yy): _ /_ _ /

Date repeat SIMPAQ interview (dd/mm/yy): _ /_ . /

Accelerometer serial number: ____________________time started :

Age (years): ________ Date of Birth (dd/mm/yy): _ /_ /______

Sex: M☐ F☐ Weight: ______(kg) Height (cm): _______

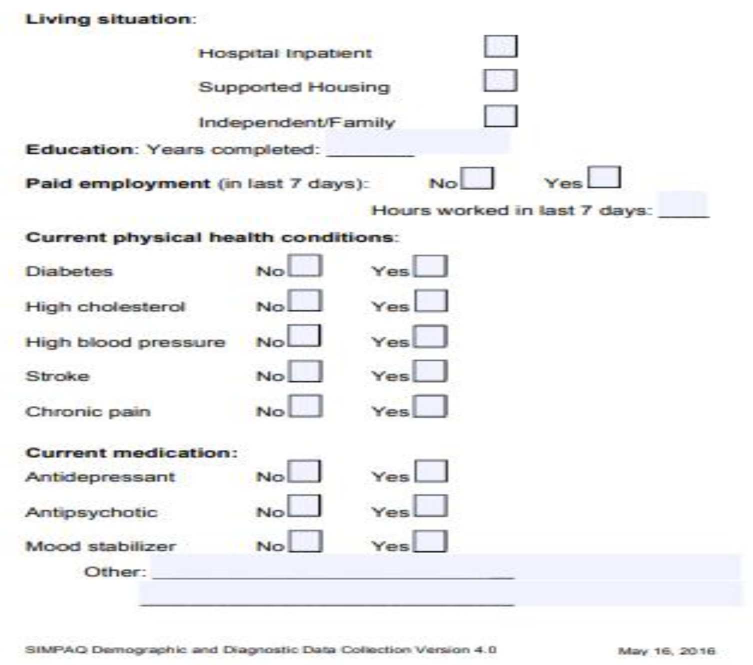
Current psychiatric diagnoses:

Schizophrenia spectrum	No ☐	Yes ☐
Bipolar disorder	No ☐	Yes ☐
Depressive disorders	No ☐	Yes ☐
Anxiety disorders	No ☐	Yes ☐
Obsessive-compulsive disorders	No ☐	Yes ☐
Trauma and stressor related disorders	No ☐	Yes ☐
Substance-related & addictive disorders	No ☐	Yes ☐
Neurocognitive disorders	No ☐	Yes ☐

Other: ____________________

Current smoker: No ☐ Yes ☐

SIMPAQ Demographic and Diagnostic Data Collection Version 4.0 May 16, 2016



Living situation:

Hospital Inpatient ☐

Supported Housing ☐

Independent/Family ☐

Education: Years completed: ________

Paid employment (in last 7 days): No ☐ Yes ☐

Hours worked in last 7 days: _____

Current physical health conditions:

Diabetes	No ☐	Yes ☐
High cholesterol	No ☐	Yes ☐
High blood pressure	No ☐	Yes ☐
Stroke	No ☐	Yes ☐
Chronic pain	No ☐	Yes ☐

Current medication:

Antidepressant	No ☐	Yes ☐
Antipsychotic	No ☐	Yes ☐
Mood stabilizer	No ☐	Yes ☐

Other: ____________________________________

____

SIMPAQ Demographic and Diagnostic Data Collection Version 4.0 May 16, 2016

Appendix 14

Participant Information Form: Study 2

A Study on Physical Activity in Mental Health Service Users

Did you know? Regular physical activity (like walking, running and house work) can give us lots of health benefits like keeping our heart healthy and managing stress and anxiety. However, it seems people who have mental health difficulties may not be active enough to get all these benefits.
To improve service users' physical activity levels, we need volunteers from all stakeholders for this research project, including those involved in the provision of services.

What is being studied? Your perspectives on the factors that encourage and discourage SU's physical activity participation.
What is involved? It will involve a 40-minute interview discussion with a researcher on a day of your choosing in your service day centre. This interview will be audio recorded. Throughout the interview and wider research project, you retain the right to withdraw at any stage of the process.

How do I take part? You can make contact with Evan Matthews (details at the bottom of page) to arrange an interview.
What is the information used for? The information from the interviews will be used to support the development of a Physical Activity Training Programme for users of the Mental Health Service.
With your permission, we would also like to use sections of your recorded interview in a later stage of this study. A group of service users, carers and health professionals from the Mental Health Team will work together to develop the exercise programme. By knowing, from the interviews, what encourages service users to exercise or not, this group will develop the exercise programme. You will be asked to consent or not consent to have your sections from your interview used as follows:

1. Your recording may be edited and played to the group of services users, carers and health professionals. No parts where you can be identified will be included. **Or**
2. Sections from what you said in the interview will be read aloud to the group (by an actor). Again, no parts where you can be identified will be included. **Or**
3. The actual audio recording will not be used in this later stage of the project.

Will I be identifiable from the research? Your identity will not be revealed in research publications. The researcher will make every effort to protect your identity where audio sections of interviews are played to working groups or read by an actor. However, complete anonymity cannot be guaranteed in this case. Furthermore, in line with the professional duty of care owed by health care professionals, confidentiality cannot be guaranteed where professional misconduct has been disclosed or where the researcher believes that you or another person is at risk of harm. Where this is the case, the information will be reported to your MH team.

In the unlikely event that the discussion distresses you; the interview will be stopped, and you will be offered a chance to speak with someone from the HSE Employee assistance programme.

You can request a copy of your interview from the research team for up to 1 month after the interview.

If you have any further questions, we would be more than happy to answer them.

Thank You.

Research Team Contact Details:
Evan Matthew (Research Student),
Department of Nursing and Health Care, WIT.
Phone: 051 302848 evan.matthews@postgrad.wit.ie

Appendix 15

Participant Consent Form: Study 2

Participant Consent Form

Examing physical activity for HSE service users with enduring mental health disorders accessing rehabilitation and recovery mental health services in the south-east of Ireland

Funded by the HSE Office of the Nursing and Midwifery Services Director

I have read and understood the Information Leaflet about this research project. The information has been fully explained to me and I have been able to ask questions, all of which have been answered to my satisfaction.	Yes ☐	No ☐
I understand that I do not have to answer all questions. I don't have to take part in this study and that I can opt out at any time. I understand that I don't have to give a reason for opting out and I understand that opting out won't affect my future medical care. There are 4 points here. Should there not be an option to tick for each?	Yes ☐	No ☐
I am aware of the potential risks of this research study. I don't remember that being addressed in the information sheet – even to say there are no risks!	Yes ☐	No ☐
I am aware of, and consent to the audio recording of information disclosed during interviews.	Yes ☐	No ☐

I have been given a copy of the Information Leaflet and this completed consent form for my records.	Yes ☐	No ☐
Storage and future use of information: I give my permission for information collected about me to be stored or electronically processed for the purpose of scientific research and to be used in <u>related studies or other studies in the future</u> but only if the research is approved by a Research Ethics Committee.	Yes ☐	No ☐
I give my permission for information collected about me to be used in research that may be published into public domains. I think you also need to get their permission to play the audio recordings in other focus groups	**Yes ☐**	**No ☐**

Participant Name (Block Capitals) | Participant Signature | Date

Co-signature witness (Block Capitals) | Witness Signature | Date

To be completed by the Principal Investigator or nominee.

I, the undersigned, have taken the time to fully explain to the above Service User the nature and purpose of this study in a way that they could understand. I have explained the risks involved as well as the possible benefits. I have invited them to ask questions on any aspect of the study that concerned them.

Evan Matthews | |

-Name (Block Capitals)| Qualifications | Signature | Date

Appendix 16

Topic Guide: Study 2

Qualitative interview topic guide

Service user	Service provider	Carer
Demographic information	Demographic information	Demographic information
What do you attend the mental health services for?	Explain your role in the mental health services	Explain your role in the mental health services
Picture discussion	Picture discussion	Picture discussion
What role do you think PA has in care?	What role do you think PA has in care?	What role do you think PA has in care?
Why is it important to you/ or not?	Why is it important to you/ or not?	Why is it important to you/ or not?
Has anyone ever helped you to do PA, tell me about it?	Do you help people to do PA, tell me about it?	Do you help people to do PA, tell me about it?
How do you find doing PA (Structured/unstructured)?	How do you think service users find the experience of PA?	How do you think service users find the experience of PA?
What is it like to keep PA going?	What is it like trying to sustain PA in the services?	What is it like trying to sustain PA in the services?
Do you think all service users get the same amount of PA? Why? e.g. high-support, low-support etc.	Do you think all service users get the same amount of PA? Why? e.g. high-support, low-support etc.	Do you think all service users get the same amount of PA? Why? e.g. high-support, low-support etc.
What things influence your PA in these areas (Use gradual probes) • Personal things • Things to do with other people • Organisational/ services things • The Environment and buildings • Policies	What things influence PA in your service (Use gradual probes) • Personal things • Things to do with other people • Organisational/ services things • The Environment and buildings • Policies	What things influence PA in your service (Use gradual probes) • Personal things • Things to do with other people • Organisational/ services things • The Environment and buildings • Policies

Appendix 17

Participant Information Form: Study 3 (Co-design)

Information leaflet for
Service users, Family members and Service providers

This is an invitation to join a co-design working group to develop a physical activity and exercise intervention for the mental health services

What is this about? We are asking you to join our 'Design team' to help in the development of a physical activity programme that can be used by the Recovery College South-East and other local services (called the *Move With Recovery* programme). Physical activity programmes are an essential component of modern mental health care but can be hard to implement effectively. A research team from Waterford Institute of Technology are bringing together a 'Design team' made up of key people who are involved with and in the mental health services (service users, mental health professionals and family members) to try and address this through four meetings (See details below in box).

What is the purpose? We want your participation because Service users, Family and Friends, and Service Providers all have a personal experience of the mental health service that are different. This gives you unique insight as to how the services may be improved, making you an important member of our 'Design team'. The group will be asked to and helped with developing a physical activity programme for the Recovery College South-East and other services that is informed by the experiences of those who use and work in the mental health services, like you.

What is involved? You will work as part of a team with others who are involved in the mental health service over the course of four separate meetings (See below). You will be guided by an outside exercise specialist to help design a physical activity programme that will be suitable for the mental health services based on your experience and the experience of others within the group.

A researcher from Waterford Institute of Technology will also be at the four meetings and will audio record the process so that information can be used to design the physical activity programme. You can withdraw from the process at any stage.

Refreshments will be available at each meeting. Each meeting will last 1 hour (Maximum).

Date	Time	Location	Agenda
25/01/19	14.00	******* (edited for confidentiality)	• Introductions • About physical activity • Physical activity guidelines / Safety
29/01/19	TBC	******* (edited for confidentiality)	• Experience mapping / Analysis • Service user, Family and Staff feedback.
TBC	TBC	TBC	• Co-designing solutions • Prototyping
TBC	TBC	TBC	• Programme review • Edits • Plan pilot role out

			• Future possibilities

Will I be identifiable from the research? Your identity will not be revealed in any report or research publication. The research team will make every effort to protect your identity. However, in line with the professional duty of care owed by health care professionals, confidentiality cannot be guaranteed where professional misconduct has been disclosed or where the researcher believes that you or another person is at risk of harm. Where this is the case, the information will be reported to the Recovery College team management.

How do I take part? If interested, please contact Evan (Research team member) 0857070681 / evan.matthews@postgrad.wit.ie). You will then be contacted to confirm the dates for the events. If you have any further questions, we would be more than happy to answer them.

In the unlikely event that the discussion raised during the working groups distresses you; you will be offered a chance to speak with someone from the MH team if you are a service user, or a GP referral will be made available to you if you are a non-service user participant. You can request a copy of the audio file from the working group for up to 1 month after the process.

Thank you for your support,

Research Team Contact Details:
Evan Matthew (Research Student),
Department of Nursing and Health Care, WIT.

Phone: 085 7070681 or 051 302848

evan.matthews@postgrad.wit.ie

Appendix 18

Participant Consent Form: Study 3 (Co-design)

Participant Consent Form

Co-design project: Physical Activity in Rehabilitation Mental Health Service

I have read and understood the **Participant Information form** about this project. The information has been fully explained to me and I have been able to ask questions, all of which have been answered to my satisfaction.	**Yes ☐** **Yes ☐**	**No ☐** **No ☐**
I understand that I do not have to answer any questions during the process. I understand that I do not have to take part in this study and that I can opt out at any time. I understand that I don't have to give a reason for opting out.	**Yes ☐** **Yes ☐** **Yes ☐**	**No ☐** **No ☐** **No ☐**
I understand that every effort will be made to protect my anonymity. This may result in some of my data being deleted.	**Yes ☐**	**No ☐**
I am aware of the potential risks of this research study outlined in the Participant Information Form.	**Yes ☐**	**No ☐**
I am aware of and consent to the audio recording of information disclosed during the co-design interviews.	**Yes ☐**	**No ☐**
I have been given a copy of the Information Form and this completed consent form for my records.	**Yes ☐**	**No ☐**
I am aware that information from the Co-design interviews may be stored and electronically processed for the purpose of scientific research.	**Yes ☐**	**No ☐**
I am aware that information collected in the interview may be used in research that may be published in public domains.	**Yes ☐**	**No ☐**
I am aware that information collected in the interview may be used to develop a physical activity training tool that may be used by Mental Health Services in the future.	**Yes ☐**	**No ☐**
Service Users Only I understand that opting out of this project at any stage will not affect any treatment that I may receive in any way.	**Yes ☐**	**No ☐**

Participant Name (Block Capitals) | Participant Signature | Date

To be completed by the Principal Investigator.

I, the undersigned, have taken the time to fully explain to the above participant the nature and purpose of this study in a way that they could understand. I have explained the risks involved as well as the possible benefits. I have invited them to ask questions on any aspect of the study that concerned them.

Evan Matthews

--Name (Block Capitals) | Signature | Date

Appendix 19

Participant Demographics Survey: Study 3

Experience-based Co-design Participants

MOVE WITH RECOVERY

Please do not write your name on the sheet. You may skip questions that you do not wish to answer.

ABOUT YOU

Please place a ✓ in the most appropriate box.

1. What age are you?

☐ 18-24 ☐ 25-29 ☐ 30-34 ☐ 35-39 ☐ 40-44 ☐ 45-49 ☐ 50-54 ☐ 50+

2. Are you? ☐ Male ☐ Female ☐ Prefer to not specify

3. What role do you have in the services?

☐ Service user ☐ Peer support worker ☐ Family/ friend of service user

☐ Service provider (Nurse) ☐ Service provider (OT) ☐ Service provider (Management)

☐ Service provider of another role. Please specify ________________

FOR SERVICE PROVIDERS AND FAMILY

4. Are you currently involved in the planning or delivering of physical activity programmes in the mental health services

☐ Yes ☐ No

FOR SERVICE USERS

5. Do you regularly take part in provided physical activity programmes for walking?

☐ Yes ☐ No

6. Do you regularly take part in provided physical activity programmes for structured sport or other exercise?

☐ Yes ☐ No

7. Do you regularly take part in provided physical activity programmes for resistance type exercise?

☐ Yes ☐ No

Do you play a role in delivering regular physical activity programmes for others?

☐ Yes ☐ No

Thank you for taking the time to fill this out.

Evan Matthews**,** Department of Nursing and Health Care, WIT. Phone: 051 302848 evan.matthews@postgrad.wit.ie

Appendix 20

Co-design Outcome Action Points

MOVE WITH RECOVERY

Key Action Points

1. Group Based
2. Co- delivery
3. Inclusivity
4. Leaders
5. Bridging to the community
6. Education
7. Motivation
8. Safety
9. Reinforcing physical activity

Appendix 21

The Move with Recovery Programme

MOVE WITH RECOVERY

A Resource for the Recovery College

MOVE WITH RECOVERY

Waterford Institute of Technology

CARE
CLINICAL • ACADEMIC RESEARCH EVIDENCE

Nursing & Midwifery Planning & Development Unit
NMPDU
Working for U
Carlow/Kilkenny/South Tipperary/Waterford/Wexford

MOVE WITH RECOVERY

Table of Contents

Acknowledgment

This document has been prepared by:

Evan Matthews, Department of Nursing and Health Care, Waterford Institute of Technology

Dr Suzanne Denieffe, School of Humanities, Waterford Institute of Technology

Dr Mary Cowman, Department of Sport and Exercise Science, Waterford Institute of Technology

On behalf of the Experience-based Co-design working group made up of dedicated individuals from the Recovery College South-East, T.A.S.K Training Centre, Skill Base Services and SECH Rehabilitation Mental Health Services.

Supported by the South-East Nursing and Midwifery Planning and Development Unit, The Health Service Executive (CARE).

Key words

Physical activity: Is any movement that increases your energy expenditure beyond what it would normally be at rest (e.g., walking, running, sport)

Exercise: is structured/planned physical activity.

Sedentary behaviour: is prolonged waking rest behaviour such as sitting or napping.

Resistance based exercise training: is exercise that requires us to use muscle force, usually against some resistance e.g. weights or body weight.

Introduction

This document is the outcome of an *Experience-based Co-design* (EBCD) process to address physical activity provision and sedentary behaviour minimisation in the Recovery College setting. This EBCD (explained in later paragraph) process is multi-stakeholder, which refers to the inclusion of staff and service users during every stage of the process.

Physical activity, exercise and reducing sedentary behaviour are important for the physical health of everyone. For people with a diagnosed mental illness, physical activity is now widely acknowledged as a primary component of good mental health care.[1]

What is this resource for?

This resource outlines the structure of the *Move with Recovery* (*MWRP*) programme. The programme offers a road-map guide for mental health services (Specifically; community-based services like Recovery Colleges) and the relevant stakeholders to deliver a structured, group-based programme that will support and educate the people who use the service to become more physically active and reduce their sedentary behaviour.

This resource builds on an existing document, the *Let's Get Active, Guidelines to Support Mental Health Service Users to Engage in Physical Activity* (Broderick & Moran, 2018), which aims to equip existing individual mental health professionals with skills and resources to promote physical activity in their service.

The *Move with Recovery* programme provides a structured programme with clear pathway and objectives for Recovery Colleges and similar community-based mental health services to use when seeking to improve the levels of physical activity for all. The skills and strategies laid out in the Let's Get Active document may be applied throughout the lifecycle of the *MWRP* to support and educate volunteers that lead out the programme locally and the management that oversee its running.

The *Move with Recovery* programme aligns with best practice mental health recovery principles through its use of peer-delivery, multidisciplinary collaboration and inclusion of many service users throughout its design.

What is Experience-based Co-design?

Experience-based Co-design (EBCD) is a multi-stakeholder collaborative process where service user and service providers are facilitated to work together on service improvements, based on the experiences of others who use the services through a type of Action Research. In the MWRP, the experiences of those who use the services were captured in recorded interviews. Next, these recordings were then played to a co-design working group in order to bring key experiences of taking part in physical activity from the perspective of those with mental health difficulty into the resource development process. After watching the experience-based film, the participants of the co-design process were then facilitated in solution-based planning and prototyping of this MWRP, but with consideration for the key experiences of others who are involved with the mental health service.

The use of EBCD

A working group, made up of key stakeholders participated in four stages of a *co-design* process. These individuals included:

- 6 people that use the mental health services
- 2 trained peer support workers
- 3 mental health services staff.

The group were facilitated by the research team to work collaboratively through each meeting. Each meeting was supplemented with supporting information and research from earlier stages of this EBCD research project, including interviews with multiple staff and, carers. In addition, interviews with service users were recreated by a professional actor in order to capture service user experience. The actors' portrayal of the interviews with service users has been played to the working group to bring the service users experience to the group.

The aims and objectives of the programme

The *Move with Recovery* programme has the primary aim to assist those who use the Recovery College and other community-based mental health services to increase their level of physical activity and reduce their sedentary behaviour to meet the PA guidelines. This is achieved by:

- Introducing/ re-introducing participants to physical activity/ exercise.
- Providing a group-based programme that is informative and motivational for physical activity/ exercise.
- Providing an ongoing group-based programme, based out of the Recovery College that participants can attend upon their choosing where support, empowerment and learning can be fostered.
- Developing and signposting pathways for

participants to take autonomous ownership of their own physical activity in local community-based settings.

The physical activity guidelines

Participants that are looking to increase their level of physical activity and meet recommended guidelines, or participants that are looking to support other participants to increase their level of physical activity, should follow guidance from the *Lets Get Active* document listed in the supplementary resources (Broderick & Moran, 2018). A brief overview of the guidelines for persons with diagnosed mental health problems are briefly summarised in the box overleaf.

What are the minimum guidelines?

Physical activity/ Exercise: 30 mins a day/ 5 days a week (about 150 mins a week) of moderate activity that makes you breathe harder than normal and makes you warm. The effects on mental health are strongest when exercise is supported by a trained instructor.

Sedentary behaviour: Prolonged sedentary behaviour is to be avoided and disrupted by replacement with light intensity activity where possible.

Resistance based exercise training: This should be included during weekly physical activity sessions and should involve major muscles throughout the body. It can be achieved through activities like household chores or exercise sessions supported by a trained instructor.

The programme structure

The *Move with Recovery Programme* is structured in a manner that has a minimum of 16 contact session with group Leaders.

These16 sessions can be broken down into the following categories:

- A minimum of eight *Sessions* that are designed to Motivate, Educate and Support participants (MES Sessions) to increase their level of physical activity and reduce sedentary behaviour (See Appendix III. for suggested content for MES Sessions).
- A minimum of eight activity-based sessions (Walk/Run Sessions) that can provide PA for participants to engage with between *MES Sessions* (See Appendix II. for suggested 21 week layout of the MWRP).

How do people join?

The *Move with Recovery* Programme should be open to all who want to take part in physical activity/exercise (This includes those who use the services, family, and staff). Individuals can join by self-referral (Showing up and signing up), by recommendation from a member of staff, or by accompanying a friend/family. It is envisaged that the *MWRP* will be included in official Recovery College timetables to improve participant engagement.

Following the appointment of *Leaders* (See Action 4, in subsequent section for more detail), the *MWRP* can commence using a rolling recruitment style. This means that participants may join/re-join the group at any stage. This should be explained to participants at the start of each *MES Session.* This rolling recruitment is visually displayed in Appendix I.

How do I use this resource?

The *Move with Recovery* programme is built on 9 key *Action points* that have been identified as priority components through the co-design work of the EBCD working group (listed in the visual diagram overleaf). These Actions underpin the ethos of *Move with Recovery* and should be considered by *Leaders* when planning and delivering *MES Sessions* and activity sessions.

MOVE WITH RECOVERY

Key Action Points

1. Group Based
2. Co- delivery
3. Inclusivity
4. Leaders
5. Bridging to the community
6. Education
7. Motivation
8. Safety
9. Reinforcing physical activity

Group safety

Upon joining the *MWRP*, new participants should sign a contract to abide by ground rules set out by the group in the first *MES Session* of your *MWRP* group. This contract should be filed appropriately in Recovery College facilities by the staff member Leader. These ground rules should be regularly reviewed by the group *Leaders* (Information on Leaders: *Action 4*). Individuals' participation in *Move with Recovery* can be denied by Recovery College staff (or equivalent service) where behaviour or conduct is deemed inappropriate against the standards of the relevant mental health service.

Action 1

Group-based

The group-based format of the activities within the MWRP is designed so that participants build social connections and support each other to engage with the programme and participate in community-based physical activity.

The local Recovery College (or equivalent service) should establish a physical activity group that will meet over a minimum of 8 Motivation, Education and Support Sessions (*MES Sessions)* during a 21 week lifecycle of the *Move with Recovery* programme (*Appendix 1*). In addition to these *MES Sessions*, the group should meet for a minimum of 8 activity session between *MES Sessions* (Appendix II).

These meetings (8 MES and 8 Activity) should be a group-based, multi-stakeholder network that is open to those that are directly or indirectly involved with the Recovery College or equivalent mental health service. The group will be facilitated in their work by two volunteer *Leaders* (Details on Leaders: Action 4).

If groups formed exceed the number of 30 people, the group should discuss splitting to form a second MWRP group. However, this should only be considered after a group discussion and consensus vote has been reached.

Leaders may identify a short local walking route. Following this, participants that attend a MES Session may then make arrangements to meet at a specified time and day where participants may walk the route together as a group.

Key points in Action 1

- Group formation
- Group should be multi-stakeholder based
- Regular meetings (minimum 8 *MES Sessions* / 8 *Activity Sessions)*

Action 2

Co-delivery

The *Move with Recovery* programme should be co-facilitated by a service provider (mental health staff member) and a service user with a lived experience of mental health difficulty. These individuals are called *Leaders.*

Participants of the EBCD process which brought about the MWRP should be co-delivered as it reflects the recovery ethos of the Recovery College.

Leaders should be existing facilitators of the Recovery College, and as such, will have formal training in group facilitation.

It is possible that both *Leaders* may have experience of facilitating groups and mental health difficulty together. However, this co-delivery approach guarantees that groups will be led by an individual with an understanding of the challenges related to physical activity for people who have experienced mental illness and another individual with experience of facilitating groups (for details on *Leaders see Action 4).* To ensure that the acquired skills and experience of *Leaders* are passed on to subsequent *Leaders*, it is suggested that one *Leader* stay in position for two cycles of the *MWRP*. Taking this staggered approach to changing *Leaders* allows for the sharing of knowledge from one established *Leader* to new incoming *Leader*. A visual diagram of this *Leader* staggered process can be seen in *Appendix I.*

Key points in Action 2

- Co-facilitation (Led by service provider and a person with lived experience of mental health difficulty)
- An individual who can draw upon personal experience.
- Crossover of new *Leader* and established *Leader*

Action 3

Inclusivity

The *Move with Recovery* Programme must focus on physical activity that is inclusive of persons that use or are connected with the relevant Recovery College or mental health facility (everyone is always welcome).

To promote inclusivity and to allow for the support of participants that are engaging in community-based activity (more detail in *Action 5)*, the *Move with Recovery* programme utilises rolling recruitment throughout the programme lifecycle (visual demonstration in *Appendix 1*) to support participants in re-joining or joining late-on in the programme. Therefore, *Leaders* must allocate the time of the start of each *MES Session* to welcome new and returning participants.

Action 3 'Inclusivity' means that the *Move with Recovery* programme should be available to all who use or are connected with the Recovery College or equivalent mental health service. Therefore, some programme participants may be presently engaged in some physical activity and others may not. In addition, some participants may be inactive but may have previously been active in years gone by. Considering this, the programme should focus on promoting physical activity that is:

- Enjoyable
- Varied
- Social
- Based on individuals' goals
- Light intensity at beginning
- Incrementally increasing over time

Key points in Action 3

The physical activity group should be inclusive of all stakeholders by promoting activity that is:

- Enjoyable
- Varied
- Light intensity for starting off
- Based on individual goals

Action 4

Leaders

The *Move with Recovery* programme sessions (*MES Sessions / Activity Sessions)* should be facilitated by a staff member and service user together, these are called *Leaders 1* and *Leader 2.*

Leader 1 and *Leader 2* have the task of organising and scheduling the 8 *MES Sessions* and 8 *Activity Sessions*. *Leaders* will be expected to work together to prepare each session in advance, and then co-facilitate each session.

Leaders should oversee two lifecycles of the *Move with Recovery* programme, assuming an increased level of experience obtained in their second cycle and therefore supporting the new Leader (visual diagram of this *Leader* changeover can be seen in *Appendix 1).* At the end of *MES Session* number 8, participants from within the *Move with Recovery* programme can volunteer to become *Leader 2*. A secret ballot can be used to elect a new *Leader* when multiple volunteers put themselves forward. This cross-over of *Leaders* will also allow for the *Move with Recovery* Programme to be adapted to meet the needs of the group, based on the experiences of previous successes and limitations.

The cyclical format of the Move with Recovery programme is designed so that participants are encouraged to progress their physical activity into a community-based initiative, but contribute their experiences back to the group where a success story has occurred. These ‘advanced’ participants should be encouraged to volunteer as a Move with Recovery Leader.

The Leader can be a challenging role that requires co-operation, teamwork and planning before each session. For example, this could involve scheduling sessions, inviting guest speakers, facilitating session discussions, sourcing information etc. A general guide for 8 *MES Sessions* that could be delivered as part of the *Move with Recovery* programme is available at *Appendix 3.*

All *Leaders* should be motivated individuals that are currently comfortable in their recovery journey.

*After each session, *Leaders* must report back to Recovery College or equivalent mental health service manager to ensure smooth running of the group and to discuss any required changes.

Key points in Action 4

- Staff/ Service user Leaders.
- An individual who can draw upon personal experience of mental illness group facilitation.
- 8 session Leadership role followed by election.
- Regular reporting to Recovery College Staff.

Action 5

Bridging to the community

Whilst physical activity delivered by mental health services is beneficial, it seems that community-based physical activity is perceived by some to be less stigmatising. A key aim of the Move with Recovery programme is to develop links and pathways for participants to become involved with physical activity/ exercise initiatives that exist within their community which they may or may not be aware of e.g., Parkrun, local gym facilities, ‘Go for life’.

A minimum of three Motivation, Education and Support (*MES* Sessions) during the *Move with Recovery* programme should be based on informing participants about and supporting participants to connect with community-based physical activity initiatives. To do this, it is recommended that guest speakers from key organisations that lead community-based physical activity be invited to attend specific *MES Sessions* to inform and prepare *Move with Recovery* participants about their local physical activity opportunities (More details on the community-based physical activity pathways that may be utilised during *Move with Recovery* found: *Appendix 3*).

The two *Actions* combined (*Action 3 ‘Inclusivity’* and the current *Action 5 ‘Bridging to the community’)* will result in some of the participants being physically active to a high standard but not sufficiently challenged by the content of *Move with Recovery* Programme. These participants should be identified by leaders and specifically encouraged to engage with the *MES Sessions* that provide tangible connections with more strenuous physical activity opportunities at a community level (e.g. parkrun). These participants may also wish to pursue programme leader training by connecting with such initiatives as ‘Go For Life’. The *Move with Recovery* programme *Leaders* should actively encourage these progressed participants to become *Move with Recovery Leaders* in turn.

Key points in Action 5

- Key programme aim is for participants to make connection with community-based physical activity, supported to do so by *Move with Recovery* group.
- *Leaders* invite a number of suggested guest speakers from local community-based activity initiatives.
- Guest speakers should include representatives from community-based physical activity initiatives that are available to participants.

Action 6

Education

The *Move with Recovery* programme aims to improve participants' knowledge on the benefits of appropriate physical activity and exercise for people with a mental illness diagnosis.

The 8 *MES Sessions* offer ongoing supported opportunities for participants to acquire knowledge for empowering changes in physical activity/exercise and sedentary behaviour through an experiential learning environment. *Appendix* 3 illustrates a guiding framework for *Leaders* in planning their individual *Move with Recovery MES Sessions* during the 21-week cycle of the programme. It is recommended that these *MES Sessions* are themed to deal with the key priority areas that have been identified during the co-design development of this programme.

In addition, participants that have transitioned their physical activity to community-based initiatives may still find it useful to use the *Move with Recovery* group for education and support in maintaining their new physical activity as many community-based physical activities may not be readily designed to meet specific needs of some participants.

Action 7

Motivation

The *Move with Recovery* programme offers an informal, group-based setting that directly addresses motivation for physical activity and exercise for participants through structured themed Sessions and indirectly though general peer support and education.

By following the guiding plan for delivering *MES Sessions* (*Appendix 3*), participants of the *Move with Recovery* programme will have access to at least one *MES Session* that specifically targets motivation for physical activity and exercise through identifying and planning for dealing with barriers to physical activity.

Action 8

Safety

Safety in this instance refers to the integrity and security of the group dynamic and also to do with safety specifically to do with physical activity.

It is important that *Leaders* begin each of the session by establishing ground rules. This should encompass key issues such as

- Confidentiality (and confidentiality limitations)
- Time keeping
- Respect

Safety in relation to beginning a new physical activity programme will be addressed in the first *MES Session* (See Appendix 3). Information on this issue will be drawn from the resource; Let's get active! To improve health and wellbeing: Guidelines to support mental health service users to engage in physical activity.

Action 9

Reinforcing physical activity

A number of planned physical activity sessions (run/walk meet) should be planned in ‘off-weeks’ when there is no *MES Session* timetabled (See *Appendix 2).* Whilst these may be local walks or other planned physical activity (e.g. football), the leaders may wish to build on previous weeks *MES Sessions* depending on the abilities of the group (e.g. they may plan to walk the local parkrun, explore a local trail after a ‘Get Ireland Walking’ talk etc.)

In addition to the 8 sessions of structured activity (Walk/ run meet), group leaders may wish to end each *MES Session* with a brief physical activity (walk, jog, stretch, body conditioning exercises). As such, participants should be encouraged to attend *MES Sessions* in comfortable clothing and gym shoes.

Whilst *Leaders* will take charge of leading the groups in these physical activity sessions, *Leaders* should draw on any existing knowledge from within the group around warm, up and cool-down etc. *Leaders* can look to the *Supporting Resources* for guidance in delivering a warm-up and cool-down but may also wish to have a guest speaker of an exercise professional attend *MES Session 1* for information on this.

Support material

1) Broderick, J. & Moran, J. (2018). Let’s get active! To improve health and wellbeing: Guidelines to support mental health service users to engage in physical activity. *The Mental Health Services, The Health Service Executive.* Dublin.

2) Stubbs, B. Vancampfort, D. … & Kahl, K. (2018). EPA guidance on physical activity as a treatment for severe mental illness: A meta-review of the evidence and a position statement from the European Psychiatric Association (EPA), Supported by the International Organization of Physical Therapists in Mental Health (IOPTMH). *European Psych, 54* (124-144).

3) Stubbs, B. and Rosenbaum, S. (2018) Exercise-based interventions for mental illness: physical activity as part of clinical treatment. London: Academic Press. Academic Press.

Appendix

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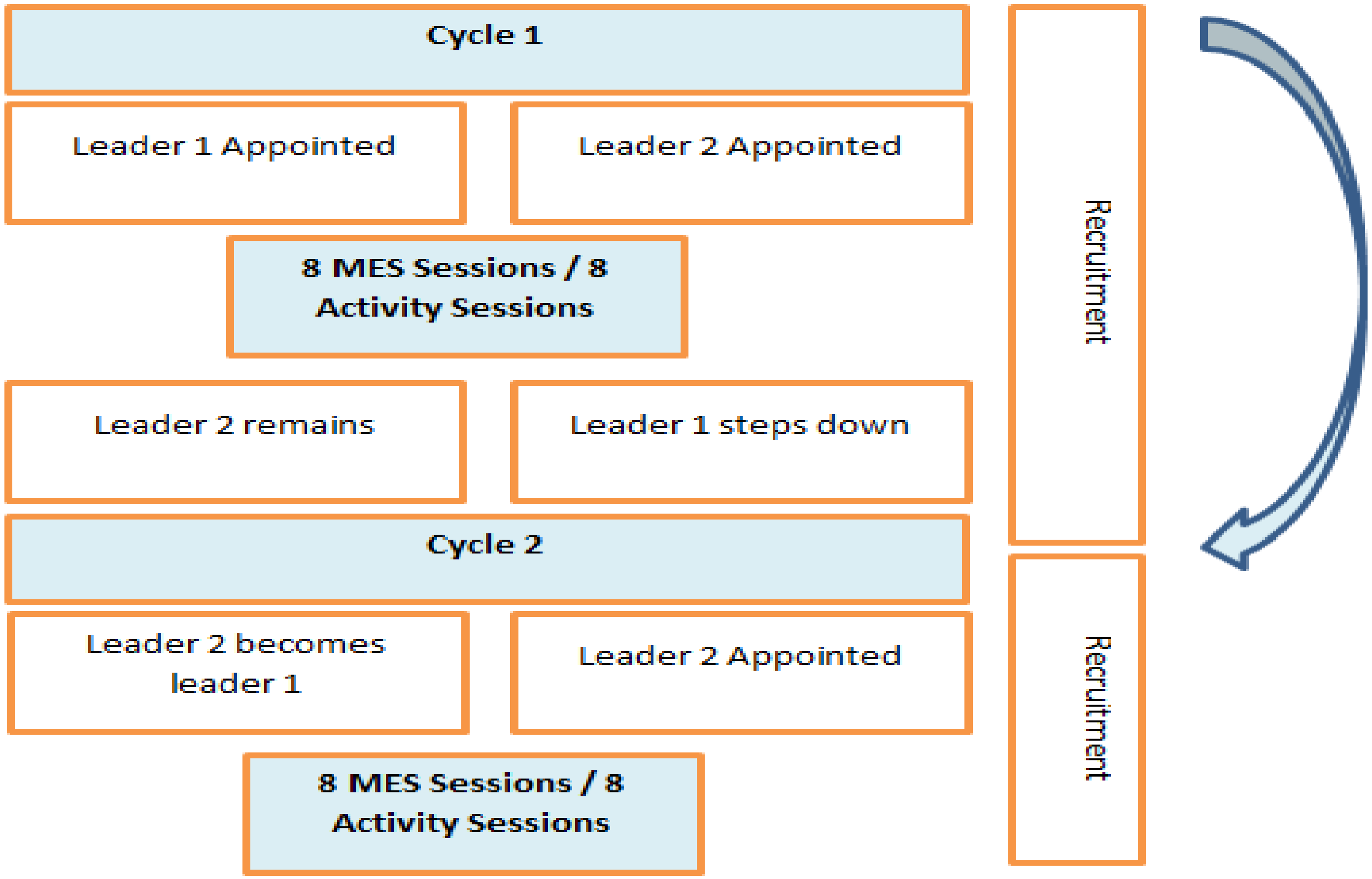
Appendix I: The suggested 21-week life cycle of Leaders



Appendix II: A suggested 21 week layout for planning role out

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 8	Week 9	Week 11	Week 12	Week 14	Week 15	Week 17	Week 18	Week 20	Week 21
MES (Session) 1		MES 2		MES 3		MES 4		MES 5		MES 7		MES 6		MES 8	
	Walk/ Run meet		Walk/ Run Meet		Walk/ Run meet		Walk/ Run meet		Walk/ Run meet		Walk/ Run meet		Walk/ Run meet		Walk/ Run Meet

Appendix III: Guiding plan for content across eight MES Sessions

	Session 1	**Session 2**	**Session 3**	**Session 4**	**Session 5**	**Session 6**	**Session 7**	**Session 8**
Themed content	Beginning exercise or physical activity safely.	Keeping energised for physical activity.	What activity is there in my community (1)?	Physical activity in my everyday life.	Staying motivated for physical activity.	What activity is there in my community (2)?	The benefit of exercising for mental health and illness.	What activity is there in my community (3)?
Key content	Pre exercise screening/ medical clearance. Learning to warm up/cool down. Equipment and clothing for activity.	Learning about PA guidelines. Eating for exercise. Hydration. Sleep.	*Get Ireland walking* information session. Information about local walking routes/amenities Starting and maintaining walking groups. Woodlands for Health programme.	Sedentary behaviour and mental health difficulty. Identifying more active lifestyle choices.	Identifying and addressing barriers to physical activity. Goal setting/ progress monitoring. Action planning.	*Go for life* information session. Becoming a Physical activity Leader (PAL). PAL Training. Fitline service. CarePals training.	What happens in your body and brain when you exercise? Activity that is important for people with mental health difficulty? Medication and exercise. About weight-gain.	Current activity programmes available within your local community (emphasis on low cost/free). Who to contact. Parkrun/Local leisure facilities open to programme participants.

Required supporting materials	*Broderick & Moran (2018):* in *Supporting Material.*	*Broderick & Moran (2018):* in *Supporting Material.* Guest speaker: A HSE approved dietician (support on dietary information)	Guest speaker: from Get Ireland Walking.	*Broderick & Moran (2018):* in *Supporting Material.*	*Broderick & Moran (2018): Supporting Material Section.*	Guest speaker: Go For Life (Age and Opportunity).	*Broderick & Moran (2018):* in *Supporting Material*. Guest speaker required: Exercise/mental health expert (PhD/Msc, university lecturer) or cht. physiotherapist/ medical professional with exercise and mental health specialisation.	Guest speaker: Local Recreation and Sports Partnership rep.
Suggested supporting materials	Guest speaker: Local exercise professional or Mental Health Services Staff involved with activity.				Guest speaker: Clinical psychologist or Exercise/mental health expert.			

Each MES Session should last about 1/1.5 hours.

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Appendix IV: A sample MES Session

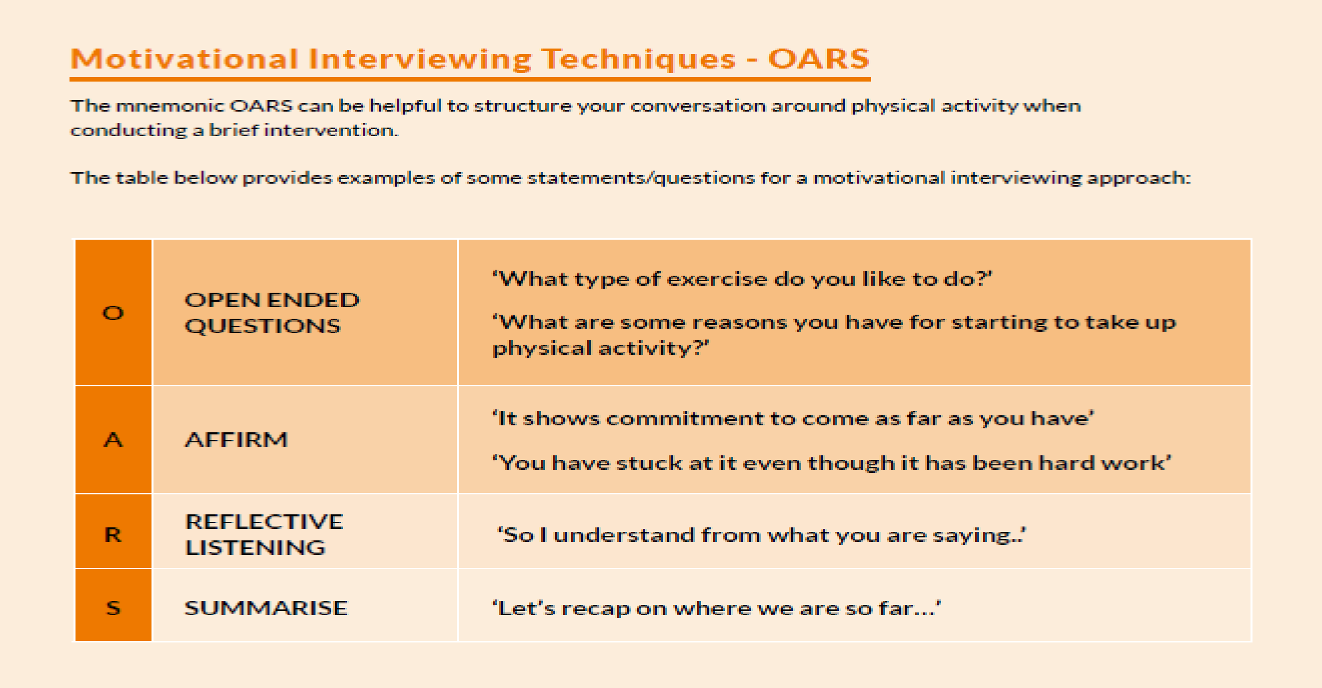
Session 5: Staying motivated with physical activity

Class duration 1.5 hours

- Ice breaker (10 minutes)
    - fun activity that introduces participants to each other
- Individual task: Identifying my own barriers to physical activity (20 minutes)
- Individual task: Identify solutions to my barriers (20 minutes)
- Group activity: Identifying solutions to barriers
    - The Leader should assist the work of the group with Resource 2 (Below).
- Discussion on group activity (15 minutes)
- Individual goal setting, action planning and goal monitoring task (20 minutes)
    - Physical activity diary (See resource 3 for ideas)
- Closing discussions (10 minutes)

Resource for *Leaders*

1. *Leader questioning skills (Broderick & Moran, 2018)*



Motivational Interviewing Techniques - OARS

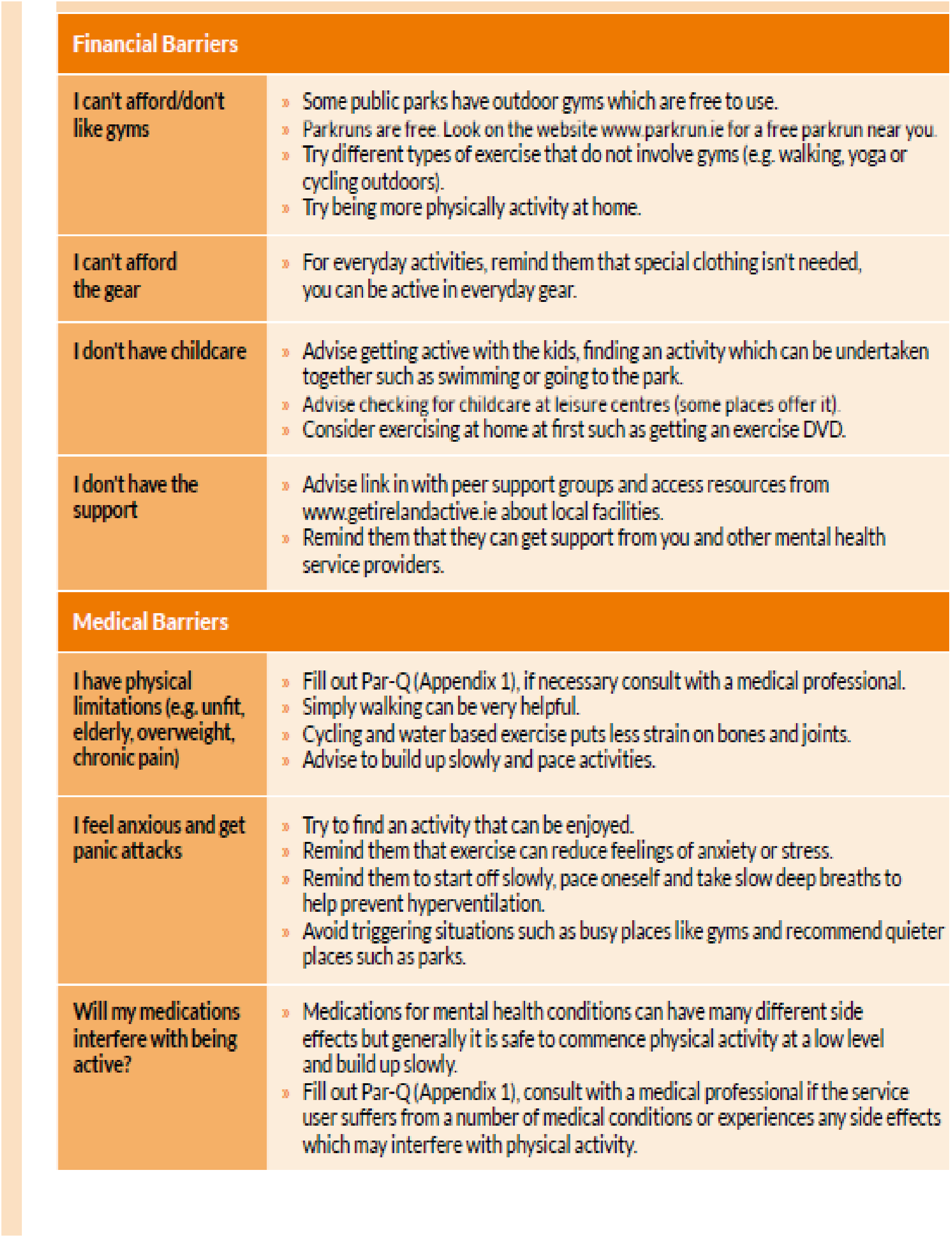
The mnemonic OARS can be helpful to structure your conversation around physical activity when conducting a brief intervention.

The table below provides examples of some statements/questions for a motivational interviewing approach:

O	OPEN ENDED QUESTIONS	'What type of exercise do you like to do?' 'What are some reasons you have for starting to take up physical activity?'
A	AFFIRM	'It shows commitment to come as far as you have' 'You have stuck at it even though it has been hard work'
R	REFLECTIVE LISTENING	'So I understand from what you are saying..'
S	SUMMARISE	'Let's recap on where we are so far...'

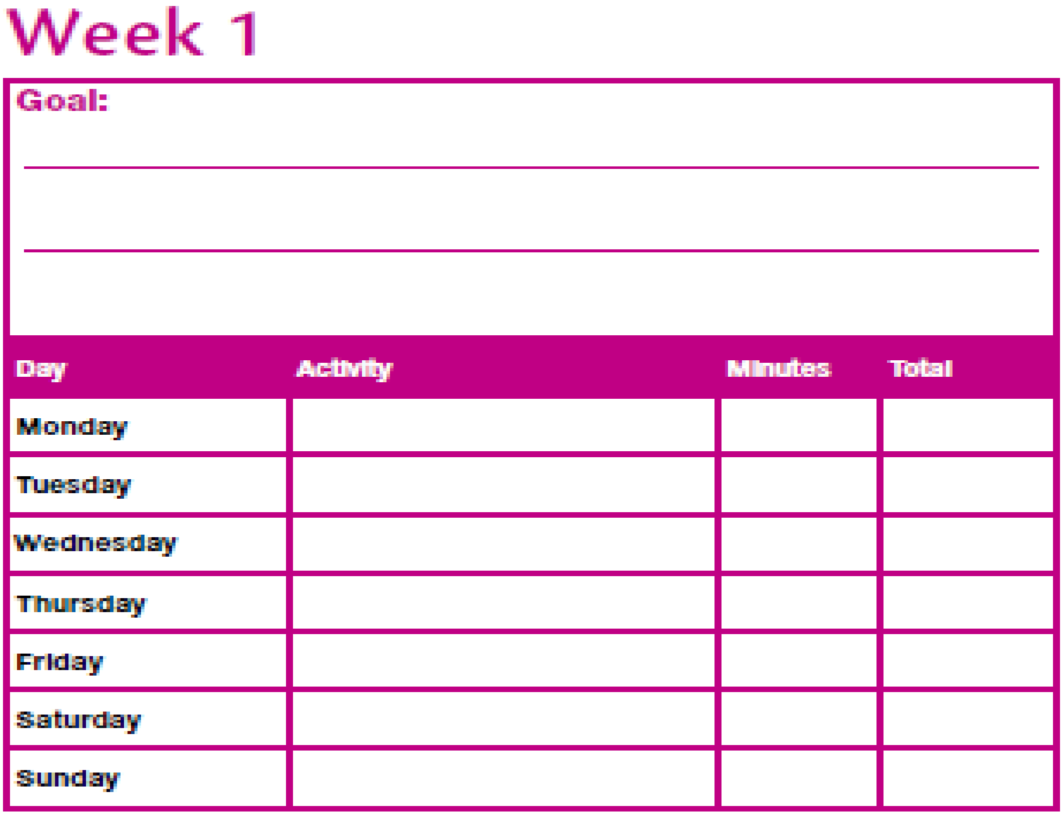
2. *Identifying solutions to barriers (Broderick & Moran, 2018)*

Environmental barriers	
Bad weather	» Recommend indoor facilities available. » Recommend investing in suitable weather gear.
There are no facilities near me	» Try walking around local area. » Look on the website www.parkrun.ie for a free parkrun near you. » Try climbing stairs a number of times. » Consider exercising at home using an exercise DVD.
Personal barriers	
I'll be too embarrassed	» Focus on individual activities. » Remind them that most people will be too busy focusing on themselves and not looking at them. » Consider exercising at home at first – getting an exercise DVD. » Advise trying men or women only activities if a mixed-gender session is a source of stress.
I don't like feeling sore afterwards	» Remind them that soreness it is only temporary and a warm-up and cool-down can prevent or reduce the sore feeling.
I don't have time	» Bouts of 10 minutes are achievable. » Some physical activity is better than none. » Advise to try and work physical activity into their day, for example try exercising at lunch time, more active play with children.
I'm too tired or have no energy	» Remind them to start small, for example start with a 5-minute walk – remind them once they get started they may feel like walking for longer. » Remind them that regular exercise can increase their energy with time. » Be empathetic and acknowledge it can be difficult to exercise if tired. » Advise to 'listen' to their bodies and engage in physical activity at best time of day with regard to energy levels and medication.
I don't feel like it (I'm just not motivated enough)	» Advise them to link up with a friend who can help and encourage them. » Start small, set realistic goals each week and suggest they reward themselves for efforts. » Remind them of the benefits of exercise. » Use activity diaries (See Appendix 2) or smart phone apps. » Ask their permission to re-visit the conversation at another time when they feel ready for change.
I'm not sporty	» Remind them that don't have to join a gym or play sports to be active. » Brisk walking can be a great start. » Make everyday activities a way to be active (for example housework,



Financial Barriers	
I can't afford/don't like gyms	» Some public parks have outdoor gyms which are free to use. » Parkruns are free. Look on the website www.parkrun.ie for a free parkrun near you. » Try different types of exercise that do not involve gyms (e.g. walking, yoga or cycling outdoors). » Try being more physically activity at home.
I can't afford the gear	» For everyday activities, remind them that special clothing isn't needed, you can be active in everyday gear.
I don't have childcare	» Advise getting active with the kids, finding an activity which can be undertaken together such as swimming or going to the park. » Advise checking for childcare at leisure centres (some places offer it). » Consider exercising at home at first such as getting an exercise DVD.
I don't have the support	» Advise link in with peer support groups and access resources from www.getirelandactive.ie about local facilities. » Remind them that they can get support from you and other mental health service providers.
Medical Barriers	
I have physical limitations (e.g. unfit, elderly, overweight, chronic pain)	» Fill out Par-Q (Appendix 1), if necessary consult with a medical professional. » Simply walking can be very helpful. » Cycling and water based exercise puts less strain on bones and joints. » Advise to build up slowly and pace activities.
I feel anxious and get panic attacks	» Try to find an activity that can be enjoyed. » Remind them that exercise can reduce feelings of anxiety or stress. » Remind them to start off slowly, pace oneself and take slow deep breaths to help prevent hyperventilation. » Avoid triggering situations such as busy places like gyms and recommend quieter places such as parks.
Will my medications interfere with being active?	» Medications for mental health conditions can have many different side effects but generally it is safe to commence physical activity at a low level and build up slowly. » Fill out Par-Q (Appendix 1), consult with a medical professional if the service user suffers from a number of medical conditions or experiences any side effects which may interfere with physical activity.

3. Goal setting resource (Broderick & Moran, 2018)



Week 1

Goal:

Day	Activity	Minutes	Total
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			