

# Empowering people through physical activity

A co-produced research project studying how to improve physical activity for people with severe and enduring mental health problems





# Contents



<b>1. Executive Summary</b>	<b>5</b>
<b>2. Research Team</b>	<b>8</b>
<b>3. Background</b>	<b>10</b>
3a. What is the research question?	11
3b. Overview of the structure of the report	11
3c. Key roles and responsibilities:	12
<b>4. Literature review</b>	<b>15</b>
4a. Literature review methodology	16
4b. Results	18
4c. Summary	19
4d. What are the most effective interventions?	20
4e. What are the barriers to physical activity interventions?	28
4f. How can these barriers be eliminated?	30
4g. What factors predict involvement?	31
4h. Conclusion	33
<b>5. Methodology of the research study</b>	<b>34</b>
5a. Research aims	34
5b. Selection of co-researchers	34
5c. The co-researcher team	35
5d. Selection of participants	38
5e. Brief description of the participating Praxis schemes	38
5f. Design and procedures	39
5g. Outcome measures	41
5h. Data analysis	42
<b>6. Quantitative findings</b>	<b>43</b>
<b>7. Qualitative findings</b>	<b>47</b>



7a.	Qualitative approach	47
7b.	Results: thematic analysis	50
	Recognition of the benefits of physical activity	50
	The social aspect of physical activity	54
	Barriers to physical activity	55
	Facilitators for physical activity	59
	Effects beyond the programme	63
	Maintaining activity post-programme	64
	Future plans	64
	Gaps in current provision	65
<b>8.</b>	<b>Discussion</b>	<b>66</b>
8a.	The effects of physical activity	66
8b.	Facilitators	66
8c.	Barriers	67
8d.	Reflections on the co-production process	68
8e.	Next steps	69
<b>9.</b>	<b>Conclusion</b>	<b>70</b>
<b>10.</b>	<b>Key Recommendations</b>	<b>71</b>
<b>11.</b>	<b>Appendices</b>	<b>72</b>
	Appendix 1: NICHS Well Check	72
	Appendix 2: PAR-Q+	74
	Appendix 3: Example exercises for GP clearance	78
	Appendix 4: Qualitative interview schedule	79
	Appendix 5: Stakeholder interviews	80
<b>12.</b>	<b>References</b>	<b>81</b>

# 1. Executive Summary



## Introduction

People with serious mental health problems have a shorter life expectancy and a higher risk of developing some medical conditions. An empowering programme that increases levels of physical activity may play a role in reducing this mortality gap. This report presents the findings from an exploratory study of a physical activity intervention based in Northern Ireland for people with severe and enduring mental health problems. The project was funded by Disability Research on Independent Living and Learning (DRILL) and employed a co-production approach between people with lived experience of mental health problems, Mental Health Foundation, Queen's University Belfast, Praxis Care, Platinum Training Institute, Northern Ireland Chest Heart & Stroke and the Northern, South Eastern and Western Recovery Colleges.

## Aims

- To increase our knowledge about what works to engage people with severe and enduring mental health problems in sustained physical activity to a level that is improving and protecting their physical health
- To identify the facilitators and opportunities that help engage and empower people with severe mental health problems in physical activity
- To explore the current barriers to physical activity

- To improve our understanding of physical activity interventions in mental health and help provide practical solutions that will improve the delivery of services in Northern Ireland.

## Methods

The physical activity programme was designed using co-production methods and delivered by personal trainers from Platinum Training Institute who had expertise in working with people with mental health problems.

Trained co-researchers (with lived experience of mental health problems) worked on the project at all stages, from informing programme design to interviewing participants and conducting the data analysis to disseminating the findings.

Quantitative data was collected on the health and lifestyles of participants and qualitative interviews and focus groups were used to explore the barriers and facilitators to physical activity and the impact of the programme that we developed.

## Key findings

Fifty-seven participants from different mental health service use settings signed up for the programme and 31 participated regularly over the 12-weeks. Participation rates were affected by difficulties getting permission from GPs.



## Effects

- Overall the participants reported physical and mental health benefits. These include improved sleep, improved energy and a reduction in the negative side effects of medication.
- The mental health and psychological benefits of engaging in physical activity were articulated by participants. These benefits included better decision-making, feeling mentally clearer and more alert. Improvements in mood and lower levels of stress were also reported.
- These achievements often resulted in behaviour change, with some participants able to establish new routines, incorporating more structure into their daily lives and making adjustments to diet and other lifestyle behaviours.
- The effects were noted to be particularly important for people with caring responsibilities involved in the study. The weekly activity created an outlet to engage socially, be active and promote self-care which in turn had a positive impact on their coping skills.

## Facilitators

- The social aspect of the programme was key for many participants. It made them more motivated to continue their involvement, created a sense of belonging and connectedness and for participants that were socially isolated, it provided new opportunities to meet new people and increase their social network.
- The trainers' qualifications, experience and knowledge of working with this population group, their creativity and flexibility in tailoring the programme

content and environment and their patient and empathetic approach was identified as important in engaging participants and helped to mitigate other barriers such as low self-esteem, the negative side effects of medication and other diagnoses-related symptoms.

## Barriers

- One of the key barriers to the programme was gaining GP approval. This process was not always straightforward and led to delays in some sites. Whilst some participants had difficulty in booking a timely GP appointment, delays also resulted from the GPs themselves, with some willing to sign off for a small fee. This was not only an important health consideration but also a requirement of the trainers' insurance.

## Co-production

- The co-production approach was an appropriate methodology for the project. The team benefitted from the range of skills and experiences relating to mental health and it was a rewarding experience for all the partners involved.

## Recommendations

- Though people with severe and enduring mental health problems have increased physical health risks and many could benefit from physical activity, they are disproportionately excluded from accessing it. Physical activity should be recognised as a core responsibility of health and social care and community-based provision of health and leisure facilities such



as local council and school-based settings.

- Physical activity interventions can be accessible and appealing to people with severe and enduring mental health problems, including carers who are often described as a forgotten workforce within service delivery. In addition, these programmes do not have to be costly. Successful programmes centred on walking and incorporated chair-based exercises and affordable equipment such as resistance bands, helping to meet the government recommended activity levels.
- Given the importance placed on the social aspect of participation, which in some cases was more important than the physical or mental health gains, this should be at the forefront when planning and delivering programmes.
- Even low-level physical activity like walking or chair-based exercises is beneficial to people with mental health problems. For schemes considering a more formal level of support, it is best that personal trainers delivering programmes to people with severe and enduring mental health problems should have an understanding of the benefits, challenges and opportunities of working with people with mental health conditions and experience of working with this population group.
- Our findings support the use of physical activity in appropriate and supportive settings offering varying levels of intensity to meet the needs of patients with lower confidence and ability. Thought could be given to the establishment of a register of mental health qualified fitness professionals, for

instance, personal trainers that have the Level 4 Award in Physical Activity for Adults with Mental Health Conditions qualification, to build confidence for health and social care services signposting to these resources.

## Conclusion

Physical activity can have benefits for people's physical and mental health and plays an important role in the social aspect of people's lives. People with mental health problems care about their physical health and by providing the right kind of help, can be supported and encouraged to incorporate physical activity into their daily lives.

A co-produced intervention to improve the physical health of people with severe and enduring mental health problems evaluated by a co-research methodology resulted in an acceptable, feasible to deliver and valued intervention. The co-research approach gave additional benefits for the co-researchers in terms of training, confidence and a broader insight into the issue of physical and mental health.

## Study limitations

As an exploratory study, the results reflect the views and experiences of a small population of mental health service users and their carers. The focus group methodology may also potentially be a source of bias. However, the results presented here are in line with the broader literature on this topic, which increases our confidence in the overall findings and conclusions.

## 2. Research Team



### **Our team of researchers are named below in alphabetical order:**

Dr Paul Best	<i>Lecturer, Queen's University Belfast</i>
Rebecca Blenman	<i>Co-researcher, Praxis Care</i>
Liam Bradley	<i>Co-researcher, Praxis Care</i>
Josefien Breedvelt	<i>Research Lead, Mental Health Foundation</i>
Prof Gavin Davidson	<i>Professor of Social Care, Praxis Chair of Social Care, Queen's University Belfast</i>
Andrew Farara	<i>Co-researcher, Praxis Care</i>
Joanne Freaney	<i>Co-researcher, Praxis Care</i>
Katherine Greer	<i>Co-researcher, Praxis Care</i>
Dr Claire McCartan	<i>Research Fellow, Queen's University Belfast</i>
Karen McCready	<i>Co-researcher, Praxis Care</i>
Lisa McKee	<i>Co-researcher, Praxis Care</i>
Aodán Mulholland	<i>Co-researcher, Praxis Care</i>
Paul Webb	<i>Research Manager, Praxis Care</i>
Chris White	<i>Citizenship &amp; Participation Officer, Mental Health Foundation</i>
Jade Yap	<i>Research Officer, Mental Health Foundation</i>

### **Acknowledgements**

This research was funded by Disability Research on Independent Living & Learning (DRILL). DRILL is funded by The National Lottery Community Fund. The Programme is led by Disability Action NI in partnership with Disability Rights UK, Disability Wales and Inclusion Scotland.

Thanks to former employees of the Mental Health Foundation, Iris Elliott and Aaron Kandola, who developed and wrote the original application for DRILL funding. Thanks also to Dr Trisha Forbes from the Centre for Evidence and Social Innovation, Queen's University Belfast who participated in the analysis process.

The research project was led by the Mental Health Foundation in partnership with Queen's University Belfast, Platinum Training Institute, Praxis Care and Northern Ireland Chest Heart and Stroke. The project was informed at key points throughout the research process by a Steering Group and an Advisory Group which included local and international members of the voluntary, statutory, and research community and included people with lived experience of mental health problems. Steering Group members advised the research team about decisions to be made regarding the project design and implementation and supported the project as delivery partners. Advisory





group members advised on issues such as the co-production methodology, existing research evidence, intervention content, data analysis and dissemination.

### **The Steering Group members were:**

Gemma Burton	<i>Workplace Health Promotion Manager, Northern Ireland Chest Heart &amp; Stroke</i>
Fidelma Carter	<i>Public Health Director, Northern Ireland Chest Heart &amp; Stroke</i>
Anna Chapman	<i>South Eastern Health &amp; Social Care Trust Recovery College</i>
Janice Gray	<i>Northern Health &amp; Social Care Trust Recovery College</i>
Lee Havern	<i>Platinum Training Institute</i>
Rosemary Hawthorne	<i>Northern Health &amp; Social Care Trust Recovery College</i>
Naomi McArdle	<i>Platinum Training Institute</i>
John Mullan	<i>Western Health &amp; Social Care Trust</i>
Paul Webb	<i>Research Manager, Praxis Care</i>
Chris White	<i>Citizenship &amp; Participation Officer, Mental Health Foundation</i>
Hannah Williamson	<i>Senior Health &amp; Wellbeing Officer, NI Chest Heart &amp; Stroke</i>
Olive Young	<i>Western Health &amp; Social Care Trust Recovery College</i>

### **The Advisory Group members were:**

Patrick Anderson	<i>AWARE NI</i>
Dr Gavin Breslin	<i>Senior Lecturer in Sport &amp; Exercise, Ulster University</i>
Jo Conaghty	<i>Physiotherapist with lived experience</i>
Joe Donnelly	<i>Tackling Awareness of Mental Health Issues (TAMHI)</i>
Dr David Falls	<i>Researcher</i>
Dr Joseph Firth	<i>Division of Psychology &amp; Mental Health, University of Manchester</i>
Prof Simon Gilbody	<i>Director, Mental Health &amp; Addictions Research Group, University of York</i>
Sinead Henry	<i>Student Welfare Officer, Queen's University Belfast</i>
Aine Morrison	<i>Professional Officer, Office of Social Services, Dept of Health NI</i>

Finally, the research team would like to thank all the participants who agreed to be interviewed and provided their perspective on physical activity and mental health.

**This report can be referenced as:** McCartan, C., Best P., Blenman, R., Bradley, L., Davidson, G., Farara, A., Freaney, J., Greer, K., McCready, K., McKee, L., Mulholland, A., Webb, P, White, C., Yap, J., Breedvelt, J.(2019). Empowering people through physical activity. Belfast, London: Mental Health Foundation, Praxis Care, Queen's University Belfast

## 3. Background



Physical activity is good for you, however, recent figures report that around twenty million adults (39%) in the UK are physically inactive (British Heart Foundation, 2017). Government guidelines for adults (Chief Medical Officers, 2019) recommend daily activity which over each week should add up to at least 150 minutes of moderate intensity or 75 minutes of vigorous activity spread across the week. Adults should also aim to undertake physical activity to build muscle strength at least twice a week and reduce the amount of time spent sedentary. Physical inactivity increases the risk of many adverse health conditions and can lead to earlier death (Lee et al., 2012).

It is important to note that although the terms 'physical activity' and 'exercise' are often used interchangeably, they are not the same. The definition of physical activity broadly refers to any movement of the body that works your muscles and requires energy expenditure (World Health Organization, n.d.). Exercise, however, refers to structured, planned and repeated activity that is focused on improving or maintaining one or more components of physical fitness (Dasso, 2018).

Physical inactivity can limit life expectancy and has been associated with 5.3 million deaths globally per year (Lee et al., 2012). Being active can help prevent and treat serious health conditions including some cancers, cardiovascular disease, diabetes and obesity (Kyu et al., 2016) and help

protect against depression (Schuch et al., 2018). Physical activity has been shown to be potentially as effective as many common pharmacological interventions (e.g. statins, beta blockers) at preventing cardiovascular disease mortality (Naci & Ioannidis, 2013).

People with mental health problems report considerably lower physical activity levels compared to the general population (de Wit et al., 2010; Vancampfort et al., 2017) but being active can be one way of improving quality of life for individuals with mental health problems by helping to alleviate symptoms and improve coping mechanisms while also conveying physical health benefits. This is particularly relevant for people with severe and enduring mental health problems, some of whom may experience ongoing problems over many years (Faulkner & Sparkes, 1999). Exercise promotion also has the potential to benefit people with mental health problems who are neither in therapy nor known to services (Martinsen, 1995).

This project set out to explore the factors that facilitate or create barriers to being active in mental health service users. We used co-production methods to develop an activity programme within supported living environments, drop-in mental health facilities and carer support groups to encourage people to be more active and discuss the obstacles they faced. The data gathered will hopefully help to inform future interventions.



### 3a. What is the research question?

The health inequalities between people with mental health problems and those without are significant. People with mental health problems have a shorter life expectancy and have a higher risk of developing other medical conditions including cancer, cardiovascular disease, diabetes and obesity. Raising physical activity levels could play an important part in trying to reduce this mortality gap by improving physical health and potentially improve mental health through a range of different mechanisms:

- It is potentially effective for cardiovascular disease (Naci & Ioannidis, 2013);
- It can increase well-being through the release of endorphins (Steinberg & Sykes, 1985) and deliver positive social experiences (Carless & Douglas, 2008a). It may also help with weight-loss which can boost self-esteem (Bartels et al., 2018); and
- It can help reduce fatigue, improve sleep and help with insomnia (Lederman et al., 2018).

Despite evidence for all the positive benefits of physical activity and mental health, activity levels in this group of people are much lower than the general population. Using a range of methods, we wanted to find out:

- What are the barriers to physical activity for people with lived experience of severe and enduring mental health problems?
- What facilitates people with lived experience of SMI to be physically active?

- Can the co-production of a physical activity intervention encourage participation, be effective and be sustained over time?

### 3b. Overview of the structure of the report

The next section of the report provides a review of the relevant literature on physical activity interventions to improve mental health. The methodology of the research is then presented. This was a qualitative study and a key element of the methodology was the recruitment of eight co-researchers to be involved in all aspects of the research. As a team, we have chosen to describe the 'peer' researchers with lived experience of mental health problems as 'co-researchers'.

For some, the term 'peer researcher' can create anxieties around mental health disclosure, particularly in the context of future employment. The term 'co-researcher', however, allows people to list their involvement on their CV or future job applications without risk of unwanted disclosure. Co-researchers were required to have experienced (past or current) mental health problems.

The role of the co-researchers was central to the research project. The researchers from Praxis Care provided expertise on the current issues relating to how mental health problems can impact on day-to-day living, the role that physical activity can play to improve well-being and understanding what can facilitate or hinder being active. The co-researchers helped to devise



the recruitment strategy, played an integral role in developing and piloting the interview questions, and providing training to partner organisations to help deliver the outcome measures for participants. They interviewed participants (supported by a member of the wider research team); represented the team at a range of knowledge exchange activities; were involved in the analysis of the data; and contributed to the writing of the final report and other dissemination activities.

### **3c. Key roles and responsibilities:**

#### **Mental Health Foundation**

MHF applied for and held the funding for this project and two members of the team (JB and JY) worked on it. JB was PI on the project and JY was co-I. In its range of responsibilities, MHF oversaw and informed the various aspects of the project once funding was allocated.

This included co-drafting the research protocols, discussing sustainability, budget management and creating the partnership agreement, arranging regular advisory group meetings, organising a research seminar and creating an Advisory Group chaired by Chris White. MHF were responsible for completing the quarterly financial reporting claims and liaising with the funder to provide regular updates and negotiate the 7-month no-cost extension. Moreover JY supported with the qualitative review extractions and write-up and MHF provided support with the drafting of the report and final review.

The policy team created a policy briefing based on the findings of the project. A communications plan was developed which included creating an animation focused on physical activity and mental health (that also highlighted the project) and organising the launch event in December 2019.

#### **The Advisory Group chaired by Chris White, MHF**

Chris has over 15 years of experience of research participation both as a peer researcher but also supporting co-production and participation of others in research activities. In chairing the Advisory Group, the focus was on ensuring that participation and co-production were considered at every stage of the project.

The Advisory Panel aimed to bring together a level of expertise to support the research partnership that included a perspective of community-based organisations, policy makers and people with personal experiences from Northern Ireland supported by two international academics with experience of mental health and physical health interventions.

The Advisory Group met at three key stages during the projects and were encouraged to put forward thoughts and ideas both in the development and delivery of the intervention and in the final stages in identifying recommendations from the project.



## **Northern Ireland Chest Heart and Stroke**

Northern Ireland Chest Heart and Stroke (NICHS) is a local charity which aims to prevent chest, heart and stroke illnesses in Northern Ireland and care for those already affected by them.

They offer a range of prevention services within schools and homelessness settings, health promotion campaigning in workplaces and the community and a large number of support groups and programmes for families and carers affected by chest, heart and stroke conditions.

They also conduct research. The team at NICHS offered each participant a comprehensive physical 'Well Check' onsite and attended Steering Group meetings.

## **Platinum Training Institute**

Platinum Training Institute (PTI) is a health and fitness education provider based in Queen's University Belfast. PTI offers a range of specialist qualifications for Personal Trainers (PTs)/Coaches which include: cancer rehabilitation; cardiac rehabilitation; mental health; neurological conditions; diabetes and obesity; exercise referral; biomechanics; strength and conditioning and more.

PTI's role in the project was to assess each participant, design and develop a flexible physical activity programme to meet the needs of each individual and site and to recruit and support PTs/coaches to deliver the programme.

## **Praxis Care researchers**

The co-researchers were supported to help develop the qualitative questionnaire, encourage participation in each site and were involved in the weekly activity programmes delivered across the sites.

They participated in interviews and focus groups with the service users and contributed to the data analysis. They helped to formulate the key findings and recommendations from the study and commented on the final draft of the report.

## **Praxis Care Research Manager**

Paul Webb was responsible for the recruitment of the peer researchers as well as working with Gavin Davidson and Claire McCartan from QUB to train and support the peer researchers during fieldwork. Paul identified and recruited all of the schemes in the study and facilitated the completion of all the necessary consent forms to participate.

Paul also participated in a number of interviews and focus groups, the qualitative data analysis exercise and commented on the final draft of the report.

## **Queen's University Belfast**

Two of the team members from Queen's University Belfast (QUB; CMcC, GD) were responsible for the day-to-day management of the project. This included assisting Praxis Care in the recruitment of the co-researchers, training and supporting them in the



field and applying for University ethical approval to conduct the study. They managed the searches for the rapid review and synthesised the quantitative evidence. They liaised with Platinum Training Institute during the development of the programme and worked closely with both PTI and NI Chest, Heart and Stroke by facilitating the screening and assessment process of potential participants, followed up GP requests and other data capture.

They conducted the interviews with key stakeholders. Regular contact with each

of the schemes was also an important aspect to our project role also. Dr Paul Best from QUB facilitated the qualitative analysis with the co-researchers with the support of Jade Yap and Chris White (Mental Health Foundation). QUB led on the final report draft.

### **Ulster University**

Dr Gavin Breslin contributed to project team meetings and facilitated the focus group held with the team from PTI. Gavin also commented on the final report.



## 4. Literature review



While we understand the benefits of physical activity, there are many factors that can reduce the motivation or ability to be active and these barriers can be increased for people experiencing severe and enduring mental health problems.

People with chronic mental health problems have higher mortality rates, levels twice that in psychotic disorders compared to the general population, and a life expectancy that can be up to twenty years shorter (Brown, Kim, Mitchell, & Inskip, 2010; Tiihonen et al., 2009). They are more likely to be sedentary than the general population and as a result are at higher risk for chronic health conditions.

Obesity rates are also higher which may be linked to lower rates of physical activity (Goff et al., 2005) and medication use. Obesity may also have a more negative effect on people with existing mental health conditions, as Kolotkin and colleagues (2008) found that for those seeking weight-loss help, health-related quality of life was poorer in people with schizophrenia and bipolar disorder than the general population (Kolotkin et al., 2008).

Many have co-morbid conditions (Gabilondo, Alonso-Moran, Nuño-Solinis, Orueta, & Iruin, 2017) that impact on their physical health and have lifestyle behaviours (smoking, hazardous alcohol use, sedentary behaviour) that also contribute to poor health outcomes. People living with mental health conditions

are also more likely to experience poverty (Bivanco-Lima, de Souza Santos, Vannucchi, & de Almeida Ribeiro, 2013; Elliott, 2016; Gabilondo et al., 2017) which can limit decision making around exercise, nutrition and other health behaviours.

Condition-specific characteristics have also been identified which may impact on physical activity. Schizophrenia is often characterised by lower cardiopulmonary fitness and impaired gait pattern (Bernard et al., 2015). Motivation levels can be lower (Bernard et al., 2013) and many report low physical energy levels too. Cognitive deficits experienced by patients with depression may affect executive function (Austin, Mitchell, & Goodwin, 2001), manifested by lower motivation levels, which can reduce the desire to exercise.

Medication can have an impact too - there is strong evidence that many anti-psychotics induce weight gain (Almandil et al., 2013; Bak et al., 2014; Torrent et al., 2008). This is concerning as anti-psychotics are used not only for patients with bipolar disorder or schizophrenia but for a range of other conditions, including anxiety disorders, depression and personality disorders (Bak et al. 2014).

Clinicians recommend careful monitoring of weight changes in patients before and after drug use prescription (Cooper et al., 2016).

Societal stigma, discrimination and the impact of low self-esteem and self-



perception on exercise volition cannot be underestimated. People with serious mental health problems can experience social withdrawal, and without having the right level of social support to undertake new physical activities this can also create barriers to participation (Richardson et al., 2005).

#### **4a. Literature review methodology**

We conducted a rapid review of the literature to inform the development of a physical activity programme which

would be relevant and practical for people wanting to increase their activity levels and establish what type of interventions are most effective with this population group. The review looked at both quantitative and qualitative literature, and focused on the effectiveness and acceptability of physical activity interventions for people with mental health problems.

Whilst the pilot study was for people with severe and enduring mental health problems, we did not want to narrow our search and risk excluding studies that offered valuable insights into the development of this programme.







## Review questions

The review was split into two sections: effectiveness and acceptability.

### Effectiveness

1. Which interventions are most effective in their potential to improve physical health and mental health?
2. Which interventions have a high completion rate and low attrition?
3. Does the delivery of the intervention affect outcome (e.g. online, face-to-face, group delivery)?
4. What are the barriers to participation in physical exercise for individuals with serious mental health problems?
5. How can these barriers be eliminated?
6. How can sustained participation in physical exercise be achieved?
7. Review of online/social media platforms for delivery.

### Effectiveness Inclusion Criteria

<b>Study Design:</b>	Systematic Review and Randomised Controlled Trials
<b>Participants:</b>	Adults aged 18+ with a clinical diagnosis of a psychosocial disability/mental health condition including depression, anxiety disorders, schizophrenia, bipolar disorder
<b>Intervention:</b>	Exercise or physical activity
<b>Comparison:</b>	Control group
<b>Outcome:</b>	Physical or mental health measures

### Exclusion Criteria

Mental health conditions that do not have a clinical diagnosis or dementia, brain injury and intellectual disabilities.

### Acceptability Inclusion Criteria

Thematic analysis of any qualitative data exploring barriers and enablers to participation. Analysis of completion/attrition rates of randomised controlled trial data.

### Searches

Six electronic databases were searched in April 2018 to retrieve systematic reviews of interventions designed to improve the physical activity of interventions: CENTRAL, Cochrane Library, EMBASE, MEDLINE, PsycInfo and TRoPHI. The grey literature was also searched.



## 4b. Results

### Systematic Reviews

38 reviews were included in the rapid review, of which three were critical reviews (Ellis, Crone, Davey, & Grogan, 2007; Greer & Trivedi, 2009; Schuch, Morres, Ekkekakis, Rosenbaum, & Stubbs, 2017), two literature reviews (Faulkner & Biddle, 1999; Mason & Holt, 2012), and two scoping reviews (Glowacki, Duncan, Gainforth, & Faulkner, 2017; Lederman et al., 2017). The rest of the 31 studies used a systematic review approach.

### Randomised Controlled Trials

45 randomised controlled trials (RCTs) were included (65 articles) with the majority conducted in the USA (13) and Canada (4). Most of the other studies were European trials: Germany (4), Denmark (3), Sweden (3), UK (3), Portugal, (2), and one trial each in France, Italy, the Netherlands, Spain and Turkey. There were also trials in Iran (3), Australia (2), Hong Kong (1) India (1) and South Africa (1).

26 trials examined the outcomes of physical exercise for depression, nine for schizophrenia/psychosis, and the remaining eleven for SMI (7) or anxiety disorders (4). Most studies described Aerobic Exercise or Resistance Exercise Training (RET), others included exercise with adjunct therapies such as cognitive behaviour therapy (CBT), pharmacotherapy, chronotherapy, electroconvulsive therapy (ECT), or counselling including nutrition advice. Alternative interventions also included yoga, Tai Chi, and mindfulness.

The shortest programme ran for 3 weeks (Bhatia et al., 2017), with others lasting for up to one year (Bartels et al., 2018; Brown, Goetz, & Hamera, 2011) and longer (Daumit et al., 2013). The longer trials included a weight-loss or nutritional component and typically reported clinically significant findings in terms of weight loss (Bartels et al., 2018; Daumit et al., 2013), and improved fitness (Bartels et al., 2018). Twelve-week programmes were most frequently reported, with 14 interventions running for this length of time.

Most designs included exercise of moderate to high intensity (based on public health recommendations of 16-17.5 kcal per kg per week (KKW) compared to a low dose of between 4-7 KKW). A number of studies (24) also featured activities that were supervised by trained fitness professionals or clinicians; some recommended interdisciplinary teams to support individual participants.

### Meta-reviews

Two further significant studies were published after our search was completed: these were a meta-review of physical activity as a treatment for severe mental illness which informed the European Psychiatric Association's guidance on physical activity as a treatment for severe mental illness and was supported by the International Organization of Physical Therapists in Mental Health (Stubbs et al., 2018) and Ashdown-Franks and colleagues' (2019) meta-review of the benefits for neuropsychiatric and cognitive outcomes.



## Qualitative Analysis

For the qualitative component, 17 studies were analysed to determine the qualitative evidence about the acceptability of physical activity interventions for people with mental health problems and the factors that may facilitate their participation in physical activity.

These studies varied in relation to their aims, sample, methods and target population. For instance, 8 studies referred to some specific exercise programme or intervention, whereas 6 focused on understanding people with mental health problems' perceptions of exercise or physical activity more generally. Two studies aimed to understand GPs' views on promoting exercise as an intervention for people with mental health problems, and one study investigated nurses' views on this. The mental health diagnoses varied across studies and included schizophrenia, depression and bipolar disorder. Given such variations, the analysis below is relatively broad-brush to gather the main themes across studies.

## 4c. Summary

There is growing evidence that a regular individualised programme that runs 2-3 times a week of 45-60 minute duration for at least 12 weeks could be beneficial and potentially reduce mental health symptoms. Very recent research has indicated more strongly that physical activity can have a positive impact on mental health for a range of mental health problems. Other recommended elements included supervised group and home-based activities, supported by trained professionals, demonstrated

to increase physical activity, encourage weight loss and improve aerobic fitness for individuals with serious mental health problems. Exercise as an adjunct to other therapies may also be beneficial including weight-loss or nutrition advice, CBT, or pharmacotherapy. Furthermore, in the absence of adverse events, and the relatively low cost of delivering these interventions they are likely to convey some benefits to participants.

Mental and general health professionals should continue to develop referral pathways to ensure that physical exercise becomes part of the prescription therapy for people experiencing mental health problems and help create a range of interventions that are relevant and accessible for many different groups of people. It is likely that exercise will help to improve the quality of life for many by helping to reduce clinical symptoms and reduce isolation and by increasing and improving physical activity and may be a cost-effective way of reducing the burden on health and social care services.

The qualitative findings support the quantitative evidence and suggest interventions should be designed to:

1. Increase knowledge of the mental health benefits of exercise
2. Have a facilitator who is skilled, supportive, and non-judgemental
3. Choose a sport/ physical activity in which participants can develop skills over time
4. Individualise the sport/ physical activity in relation to the participants to ensure that the level of intensity is appropriate

5. Build a solid support system for participants
6. Focus on the individual throughout – being aware of their condition and their needs
7. Incorporate a more holistic approach to the intervention
8. Where feasible, reduce the number of practical barriers participants may have, e.g. ensure costs to participants to attend are as low as possible

#### 4d. What are the most effective interventions?

It is difficult to identify which interventions are the most effective because much of the evidence is of low quality. Many of the systematic reviews conclude that the quality of evidence is poor and that more research is required. Since this review was completed, however, there has been more research conducted in this area, strengthening and developing the evidence base. A meta-review by Stubbs and colleagues (2018) found evidence that physical activity could improve depressive symptoms for major depressive disorder and aerobic physical activity could improve psychiatric symptoms for schizophrenia-spectrum disorder.

The authors found improvements to cardiorespiratory fitness were reported for both MDD and schizophrenia spectrum disorder, though more research is needed to determine the effect of physical activity on bipolar disorder (Stubbs et al., 2018). In a similar vein, a meta-review by Ashdown-Franks

and colleagues (2019) found evidence that exercise has a positive impact on mental health symptoms for a range of mental health conditions including MDD, anxiety, schizophrenia, eating disorders and substance use disorders. These more recent studies provide more compelling evidence to indicate that exercise is an effective intervention for people with mental health problems and informed the new European Psychiatric Association guidelines on physical activity for serious mental illness.

Of the 40 included studies in Rhodes' systematic review of interventions for serious mental health problems (Rhodes, Temple, & Tuokko, 2011), all displayed a possible risk of bias, and van Hasselt (2013) also found that uniform measures were not used making valuable comparisons almost impossible. Cooney's review (2014) examined 39 studies with a total population of n=2326, but many were small studies and of low quality. Of the high-quality studies, the effect size for physical exercise for depression was clinically small and not statistically significant. The review concluded that exercise is moderately more effective than no therapy for reducing depression symptoms but is no more effective than antidepressants or psychological therapy. However, more recent evidence from Stubbs and colleagues (2018) concludes that physical activity can improve the quality of life of individuals with MDD.

Sample sizes are typically small, with limited follow-up, no controls and although results may indicate a general positive trend to improvement these are often not clinically or statistically significant (Cooney et al., 2014; Ellis et al., 2007; Faulkner & Biddle, 1999;

Kvam, Kleppe, Nordhus, & Hovland, 2016; Martin, Beard, Clissold, Andraos, & Currey, 2017). This demonstrates the difficulty researching populations with serious mental health problems, how best to consider the heterogeneity of the population, design, implementation and assessment of interventions (Rosenbaum et al., 2016; Schuch et al., 2017) and the need for larger randomised studies to measure their effectiveness (Gorczynski & Faulkner, 2010; Park et al., 2013). Martin also highlights the need for specific guidelines to be developed for SMI populations, with current guidelines having been adapted and therefore non-specific (Martin et al., 2017). The criticisms and limitations outlined above are in relation to the studies included in our review; more recent meta-reviews have tried to address these issues and increase the robustness of evidence in this area (e.g. Stubbs et al., 2018; Ashdown-Franks et al., 2019).

Schuch and colleagues also suggest that effect sizes may be underestimated in the literature because of publication bias (Schuch et al., 2016). Meta-analysis of eleven RCTs measuring the efficacy of exercise treatments for affective disorders (Stathopoulou, Powers, Berry, Smits, & Otto, 2006) produced a very large effect size for exercise compared to nonactive comparison groups. Alongside this, there is evidence that general levels of exercise activity increase which may have the potential to encourage longer term benefits (Pearsall, Smith, Pelosi, & Geddes, 2014).

There is potential for exercise to play an adjunct role to help alleviate some of the negative symptoms of schizophrenia and help develop a coping strategy for the positive symptoms (Faulkner

& Biddle, 1999). Firth's more recent review (Firth, Cotter, Elliott, French, & Yung, 2015) presents more encouraging evidence for the benefits of exercise, and although there was no evidence that exercise interventions had a significant effect on BMI, there was evidence for improved physical fitness and other cardiometabolic risk factors. Psychiatric symptoms were significantly reduced by interventions using around 90 minutes of moderate to vigorous exercise per week, and this level of exercise also reported significant improvements in functioning, co-morbid disorders and neurocognition.

Longer training regimes that lasted for at least 24 weeks improved indicators of functional capacity in patients with schizophrenia (Bernard et al., 2015). The use of physical activity as an adjunctive treatment for schizophrenia-spectrum disorders in improving symptoms, cognition and quality of life is strongly supported by the recent meta-review by Stubbs and colleagues (2018) which was beyond the scope of this review. In contrast, Brondino's (2017) systematic review of cognitive outcomes in major depressive disorder physical exercise interventions concluded that dose had no impact on outcome.

Data from individual RCTs also reported positive outcomes and no adverse effects were reported in any of the studies apart from one trial which saw a reduction in spatial working memory and set-shifting outcomes in the low dose condition (Greer, Grannemann, Chansard, Karim, & Trivedi, 2015). Many of the outcomes reported did not reach statistical significance as was found for the systematic review evidence, however significant outcomes were reported in the studies listed below:



Significant outcomes reported	Study
<b>Mental health outcomes</b>	
<b>Reduction in anxiety and stress</b>	Ashdown-Franks et al., 2019 Carneiro et al., 2015; Herring, Jacob, Suveg, & O'Connor, 2011; Jazaieri et al., 2012; Jazaieri, Lee, Goldin, & Gross, 2016; Murphy et al., 2012
<b>Reduction in depressive symptoms</b>	Ashdown-Franks et al., 2019 Carneiro et al., 2015; Doose et al., 2015; Foley et al., 2008; Gourgouvelis, Yelder, & Murphy, 2017; Hallgren et al., 2016; Jazaieri, Goldin, Werner, Ziv, & Gross, 2012; Legrand & Neff, 2016; Martiny et al., 2012; Martiny et al., 2015; Murphy et al., 2012; Rethorst, Toups, et al., 2013 Stubbs et al., 2018
<b>Reduction in psychiatric symptoms in schizophrenia &amp; psychosis</b>	Ashdown-Franks et al., 2019 Beebe et al., 2005; Marzolini, Jensen, & Melville, 2009; Usher et al., 2018 Stubbs et al., 2018
<b>Physical outcomes</b>	
<b>Increase in physical activity levels</b>	Murphy et al., 2012
<b>Increase in cardiorespiratory fitness</b>	Bartels et al., 2018; Beebe et al., 2005; Carneiro et al., 2015; Forsyth, Deane, & Williams, 2017; Marzolini et al., 2009 Stubbs et al., 2018
<b>Reduction in fatigue</b>	Herring et al., 2011
<b>Reduction in insomnia</b>	Herring, Kline, & O'Connor, 2015; Martiny et al., 2015; Rethorst, Sunderajan, et al., 2013



<b>Weight loss, body fat &amp; BMI</b>	Bartels et al., 2018; Beebe et al., 2005; Carneiro, Fonseca, Vieira-Coelho, Mota, & Vasconcelos-Raposo, 2015; Daumit et al., 2013; Green, Janoff, Yarborough, & Yarborough, 2014
<b>Psychological outcomes</b>	
<b>Increase in cognitive functioning</b>	Bhatia et al., 2017; Greer et al., 2016; Ho et al., 2016; Khalil, Callaghan, Carter, & Morres, 2012 Stubbs et al., 2018
<b>Increase in quality of life, pleasure and motivation</b>	Greer et al., 2016; Herring, Johnson, & O'Connor, 2016; Littlecott, Moore, Moore, & Murphy, 2014; Stubbs et al., 2018 Toups et al., 2017
<b>High satisfaction levels with the intervention</b>	Green et al., 2014

Non-significant improvements were observed in depressive symptoms, weight loss, aerobic fitness and cognitive gains but it is important to note that many of the studies had small sample sizes with no long-term follow up making firm conclusions about the long-term benefit of programmes difficult to make. In contrast, Stubbs et al. (2018) recommended, based on their meta-review findings, that physical activity can lead to improvements in the above areas.

They also recommended that physical activity in the form of an aerobic intervention should be used as a treatment for mild-moderate depression to improve symptoms and physical fitness.

There is little evidence available on the cost effectiveness of interventions (Park et al., 2013), but evidence from randomised controlled trials suggest that physical exercise is value for money and can be delivered at a relatively low cost (LeBouthillier & Asmundson, 2017; Littlecott et al., 2014).

Analysis of the qualitative evidence found studies that looked at preferred physical activity, however no clear superior sport or physical exercise activity was identified. Busch et al. (2016) found that participants preferred an exercise-based treatment for depression that is: coached; between 30 and 60 minutes; occurs multiple times a week; provided in the home;



and is an individual intervention, as opposed to a group intervention. In contrast, more studies, such as Carless and Douglas (2008b), recommended group-based exercise interventions to allow for social interaction and shared experience. A recurring theme in a number of studies was that people with severe mental health problems valued the fact that attending an exercise class or programme forced them to leave their homes and added much-needed structure to their week (Hodgson, McCulloch, & Fox, 2011).

## Exercise as an adjunct therapy

Evidence from two systematic reviews identified the potential for exercise to play an adjunct role: in schizophrenia (Faulkner & Biddle, 1999) and exercise as an adjunct to anti-depressant medication yielded a moderate effect that trended towards significance (Kvam et al., 2016). RCTs that included exercise as an adjunct therapy also reported positive outcomes that had statistical significance including nutrition counselling in the SHAPE Lifestyle intervention (Bartels et al., 2018), weight management (Daumit et al., 2013; Green et al., 2014), pharmacotherapy in the Happy Brain programme for women (Carneiro et al., 2015), motivational interviewing (Forsyth et al., 2017) and CBT (Hallgren et al., 2016).

Two qualitative studies discussed the benefits of an intervention adopting a more holistic approach which targets aspects other than exercise, such as diet and weight management (Bassillios, Judd & Pattison, 2013; Crone & Guy, 2008) to provide participants with a

more well-rounded view of how to lead a healthy lifestyle. Wydenan's (2012) study focused on service user perspectives of participating in programme at the Western Australian State Forensic Mental Health Services, which provided patients with education sessions on a range of lifestyle issues alongside a formal exercise programme. This allowed participants to be exposed to a range of activities, which benefited their health and wellbeing and their overall recovery process.

## Delivery

Karasouli (Karasouli & Adams, 2014) reviewed theory-driven and evidence-based mental health self-management e-resources that were prevention or recovery-focused for chronic mental health problems. Of the eight included studies (including one RCT), they concluded that e-resources have potential but there is a need for the development of the evidence base. Moran (2018) also evaluated eHealth interventions to promote physical activity including four web-based, three web and mobile application and one e-mail-based compared to standard care, wait-list and active controls.

The evidence was found to be unclear whether they were better than traditional mental health services at increasing physical activity however they are innovative and low cost. An RCT for internet-based CBT and physical exercise also reported a reduction in psychological functioning and sleep disturbances compared to treatment as usual (Strid, Andersson, Forsell, Öjehagen, & Lundh, 2016), the





authors concluding that this could be an alternative delivery model for primary care. There was evidence that interventions that were specifically tailored for individuals was important (Rosenbaum et al., 2016) and may increase the likelihood of consistent exercise (LeBouthillier & Asmundson, 2017).

## Type of programme

### Exercise Intensity

Aerobic exercise – 69.3% of studies that investigated the antidepressant effect of exercise on depression showed significant results. HIT training improved indicators of functional exercise capacity in patients with schizophrenia (Bernard et al., 2015). Firth's review of interventions for schizophrenia also concluded that 90 minutes of moderate to vigorous exercise weekly could lead to a significant reduction in psychiatric symptoms, improved functioning, co-morbid disorders and neurocognition (Firth et al., 2015).

Clinicians recommending exercise for patients with depression should recommend moderate-intensity exercise (e.g. brisk walking at 3-4 miles/h, stationary cycling at 50-100 W) for a total of at least 150 minutes/week (Greer & Trivedi, 2009). Stanton's review (Stanton & Reaburn, 2014) of five RCTs for depression examined programme variables for the type, frequency, intensity, duration of exercise concluding that supervised aerobic exercise, undertaken 3/week at moderate intensity for a minimum of 9 weeks was effective in the treatment of depression. High intensity exercise produced superior results to low intensity in a

meta-analysis of treatments for affective disorders (Stathopoulou et al., 2006). Improvements in cardiovascular fitness were observed in high intensity exercise at least 3/week in Vancampfort et al.'s 2017 of 23 studies of interventions for SMI.

One systematic review (Gordon, McDowell, Lyons, & Herring, 2017) considered the effects of resistance exercise training on participants experiencing anxiety and concluded that RET significantly improves anxiety symptoms compared to non-active controls. Combined aerobic and RET interventions were found to improve strength, schizophrenia symptoms and overall mental health in Martin's review (Martin et al., 2017). Improvements in cardiovascular fitness were not statistically significant but were still clinically meaningful.

The intensity of the exercise or physical activity is important to consider especially in relation to the mental health problem of the participants, as this can have implications for the choice of activity. Firth et al.'s qualitative study (2016) focused on service users in first-episode psychosis and found that engaging in exercise helped participants with psychiatric symptoms but only if the exercise was vigorous enough to allow for the positive effects associated with biochemical releases. At the same time, an activity which is overchallenging may exacerbate participants' negative feelings and self-beliefs (Cole, 2010). For people with Bipolar Disorder, vigorous activity when the individual is experiencing mania can actually be harmful (Wright, Armstrong, Taylor, & Dean, 2012). In addition, it is important to consider gender preferences



when considering the intensity of an intervention, as there may be some evidence that women tend to prefer graded intensity over set intensity (Busch et al., 2016).

### **Supervised Activity**

Many of the studies report of the benefits of a suitably qualified professional supervising physical activity sessions (Firth et al., 2015) and recommend that patients with depression work with a fitness professional (Greer & Trivedi, 2009). Lederman and colleagues (Lederman

et al., 2017) looked at examples of good practice in Australia and they concluded that irrespective of the setting, exercise interventions supervised by qualified professionals incorporating multidisciplinary teams that adopt routine cardio metabolic monitoring which are participation-focused and supported by staff and management are likely to be successful.

Stanton and Happell's review (Stanton & Happell, 2014) of inpatient setting interventions recognised the important role that nursing staff can play in





encouraging patients to engage in exercise. Vancampfort et al.'s 2017 review also highlighted the added benefits of multidisciplinary teams of qualified healthcare professionals to support people with SMI in maintaining an active lifestyle (Vancampfort et al., 2017). Another Vancampfort review (Vancampfort, Rosenbaum, et al., 2016) of nineteen studies for schizophrenia patients concluded that supervised physical activity should be prescribed by qualified professionals to enhance adherence, improve psychiatric symptoms and reduce the onset and burden of cardiovascular disease.

It found that the qualification of the professional delivering the intervention moderated treatment dropout rates and where physical activity was supervised benefits approached statistical significance. The dropout rates were more than double in the nonactive control groups compared to the experimental groups. Similarly, the recent Lancet Commission (Firth et al., 2019) and also the European Psychiatric Associations Guidelines (Stubbs et al., 2018) are both in agreement in recommending that exercise is delivered in a structured, supervised manner, ideally by physical activity / fitness professionals.

One of the key themes to emerge from the qualitative data was the integral role of the exercise instructor or facilitator, and their influence in encouraging participants to attend and engage with exercise (Firth, Carney, et al., 2016). The facilitator should possess the skill to work with participants of different abilities, welcoming them all unconditionally (Hodgson et al., 2011)

Given that participants can often be quite anxious regarding their experience with physical activity or entering a social environment, an effective facilitator would be non-judgemental and help to assuage their concerns, thus enhancing feelings of connectedness. In a study by Searle et al. (2014), which explored the views of participants with depression of a randomised controlled trial who engaged in a physical activity programme, the facilitator built up a rapport with participants through face-to-face and telephone calls.

The relationship between facilitator and participant, whereby the facilitator almost acts as a confidant, was valued by participants in Wynaden, Barr, Omari & Fulton's (2012) study, and helped to enhance participants' sense of relatedness, competence and autonomy, positively impacting their intrinsic motivation to engage in physical activity.

### **Inpatient Setting**

Exercise programmes delivered in an inpatient setting are effective in improving mental health outcomes for people with a range of mental health problems. Nurses may be well positioned to encourage and assist service users to engage in exercise. Aerobic exercise programmes appear popular and beneficial, partly because they can be implemented with little or no cost and with minimal training of supervisory staff (Stanton & Happell, 2014).

### **Group vs Individual Exercise Settings**

Whether an activity is group or individually based depends on each individual, highlighting the importance of an individualised training programme.



## Motivational Component

Motivation levels may be low in this population, Bernard's systematic review (2015) of interventions for schizophrenia found that adding a motivational intervention with an exercise programme will help increase participation. Multicomponent behavioural adherence programmes based on the model of stages of change developed by Prochaska and DiClemente greatly increased adherence to exercise (Greer & Trivedi, 2009).

Josefsson et al.'s review of 15 exercise studies for depression concluded that exercise had a large anti-depressant effect including one specially designed exercise programme that included motivational support which was significantly more effective in reducing depression compared to the regular exercise programme (Josefsson, Lindwall, & Archer, 2014).

## Alternative Types of Exercise

### Yoga / Tai Chi

A systematic review of yoga interventions (Broderick, Knowles, Chadwick, & Vancampfort, 2015) concluded that although yoga could have beneficial outcomes for people with schizophrenia in terms of mental state, social functioning and quality of life, the evidence base is weak (limited data and only short term outcomes reported) therefore it is difficult to make a strong conclusion. In one trial comparing yoga to exercise found better outcomes for mental state and significantly better quality of life scores (Gorczyński & Faulkner,

2010). Rosenbaum (Rosenbaum et al., 2016) reviewed 39 physical activity randomised controlled trials for adults with depression, including structured exercise programmes and counselling, lifestyle interventions with a major physical activity component including Tai Chi and PA, and found these to be effective in reducing depressive symptoms amongst people with a MI. Physical activity also reduced symptoms of schizophrenia, and there were small improvements in anthropometric measures, improved aerobic capacity & quality of life amongst people with a MI.

### Dance therapy

Three studies were included in a systematic review of dance therapy for depression (Meekums, Karkou, & Nelson, 2015), but the evidence was of a low quality in three small trials and no conclusions could be drawn about its effectiveness.

## 4e. What are the barriers to physical activity interventions?

Most of the 17 qualitative studies identified key barriers to people with mental health problems engaging in physical activity, with the most common barriers relating to internal (intrinsic) barriers rather than external (extrinsic) barriers.

The more practical barriers to engagement – such as unemployment, navigating public transport – were mentioned by a few studies. Certain steps can be taken to overcome some of these, such as ensuring ease of access to participate in an intervention at minimal



cost (Wynaden, Barr, Omari & Fulton, 2012), to encourage attendance and engagement. Though practical barriers are important to address, they seemed to come second to the more internal barriers. People's motivations are an important part of the change process and ensuring that activity is maintained and continued (Pickett, Kendrick & Yardley, 2017).

## **Intrinsic Barriers**

Motivation was the most commonly cited barrier to engaging in physical activity, and this might be especially pertinent for people with mental health problems, as their motivation level can be impacted by their mental health itself or even the side-effects of medication. Indeed, their mental health problems or their medication can contribute to feelings of lethargy or fatigue, which may fuel a lack of motivation (Cole, 2010).

Moreover, quantitative evidence was presented for stress, depression, disinterest in exercise, feeling unsafe or fear of injury (Firth, Rosenbaum, et al., 2016). Other barriers included lack of support, no partner to train with, or lack of time. The time devoted to exercise has been the most researched aspect of barriers to activity but often be considered unimportant (Firth, Rosenbaum, et al., 2016).

Other reviews identified barriers including poor self-perception (Bernard et al., 2015), shyness or embarrassment (Glowacki et al., 2017), guilt (Glowacki et al., 2017) which had a negative impact on participation. Anxiety was also cited in several qualitative studies as being a barrier to engagement in physical

activity, though the root of this anxiety varied. Some participants felt initially socially anxious (e.g. Johnstone, Nicol, Donaghy & Lawrie, 2009); others were anxious about their perceived lack of exercise ability or inexperience (e.g. Firth et al., 2016). Cole (2010) highlighted the social physique anxiety some women may experience when considering whether to engage in physical activity. There was also quantitative reports of fear of social interaction, lack of enjoyment and boredom (Glowacki et al., 2017).

## **Extrinsic Barriers**

### **Other health risk factors**

Chronic mental health problems are often comorbid with other physical health conditions, leading to poor health or physical illness with typically low energy levels (Firth, Rosenbaum, et al., 2016) or tiredness (Glowacki et al., 2017). Activity monitors found that adults with bipolar disorder were found to exhibit high levels of sedentary behaviour during waking hours (Vancampfort, Wyckaert, et al., 2016) and this is also observed in other psychosis conditions. Higher BMI and cigarette consumption can also impact on a person's ability to participate in certain activities. (Bernard et al., 2015).

### **An awareness of the potential “dangers” of exercise for people with mental health problems**

Another theme identified from several studies was that there can be times when exercise or physical activity may have negative effects for people with mental health problems. In a study by



Searle et al. (2012), GPs expressed that recommending activity to a patient with depression could exacerbate feelings of low self-esteem if the patient did not successfully initiate or maintain the activity. This sentiment was echoed by Cole (2010) who highlighted the importance of finding a physical activity that was stimulating and challenging for people with depression.

A less challenging activity that is insufficiently stimulating can exacerbate feelings of lethargy and motivation, whilst an over-challenging activity could intensify feelings of failure and worthlessness that are associated with depression. Wright, Armstrong, Taylor & Dean (2012) highlighted that though exercise is used by some people with Bipolar Disorder as a way to regulate their symptoms, there are potential harmful effects of vigorous or competitive exercise during mania.

With these considerations in mind, it is very important that there is a solid support system in place and there is a skilled, knowledgeable facilitator leading sessions who is able to monitor this behaviour as discussed in a later section.

A review by Schuch and colleagues (2016) discovered that about half of patients with major depressive disorder do not respond to exercise and identified factors that moderated the anti-depressant effects of exercise ranging from individual level, clinical (depression severity, global functioning, frequency of physical symptoms, trait anxiety), and psychological (life satisfaction and self-esteem) but these results were based on a small number of studies of limited strength.

### **Managing participants' expectations whilst still being encouraging**

Though there is a need to inform people with mental health problems of the potential benefits of physical activity to mental health, it is also important that participants' expectations of what they expect to achieve from engaging in a physical activity intervention are managed. Indeed, Jones, Harris, Waller and Coggins (2005) found that participant expectations, particularly in relation to personal development, were significantly higher for dropouts than completers.

Whilst high expectations may initially encourage attendance, they can negatively impact adherence once these initial expectations are violated. It is therefore important to strike a balance between encouraging sufficient expectations and self-efficacy to motivate people with serious mental health problems to engage, whilst at the same time, not being unrealistic about the outcomes or the effort involved.

### **4f. How can these barriers be eliminated?**

Some of the barriers which could restrict participation in exercise related to symptoms associated with chronic mental health problems included stress and fatigue identified by Firth providing professional support to identify and achieve exercise goals may help them to overcome psychological barriers and maintain motivation towards regular physical activity (Firth, Rosenbaum, et al., 2016).



Glowacki's review found the most common facilitators for enabling participation in physical exercise were associated with the domains of Beliefs about Consequences, Social Influences, Emotion and Behaviour Regulation (Glowacki et al., 2017). The Emotion domain appears to be particularly dominant for individuals with depression, yet is not covered by traditional theories of behaviour change, these may be overlooked when trying to promote physical activity among this population.

A couple of reviews have identified institutional barriers to the promotion of exercise as a relevant therapy and more work is required to promote this as a viable therapy option (Lederman et al., 2017; Mason & Holt, 2012). Mason's qualitative review concluded that exercise interventions deserve greater emphasis both theoretically and clinically as many users find them to be socially inclusive, non-stigmatising and effective in aiding recovery (Mason & Holt, 2012).

### **The importance of having a solid support system in place**

Most qualitative studies highlighted the importance of enhancing the element of social support for participants. Though some studies emphasised the positive social interaction element of group interventions (e.g. Bassillios, Judd & Pattison, 2013; Carless & Douglas, 2008; Crone & Guy, 2008), the need for social support appeared to extend beyond the activity itself.

Multiple studies that focused on participants of an intervention described having a system in place, whereby

a facilitator or staff member would keep in contact with the participant to strengthen feelings of support and accountability. This is because mental health professionals are generally in a strong position to influence health-promoting behaviours (Bassillios, Judd & Pattison, 2013) and can thus help participants overcome amotivation and anxiety. This could involve having a facilitator or staff member to provide support to participants periodically, either face-to-face or by telephone (Searle, 2014), or having someone ring participants if they do not attend a session (Crone & Guy, 2008), or having some staff member participants to the programme at least for the first session to enable them to familiarise themselves with the location and the programme staff (Hodgson, McCulloch & Fox, 2011; Firth et al., 2016).

The value of peer support was also mentioned by a few studies (Firth et al., 2016; Johnstone, Nicol, Donaghy & Lawrie, 2009; Oman & Oman, 2003). Green (2014) describes the PREMIER study which promotes dietary and exercise lifestyle change through the use of walking and food diaries and family members are encouraged to attend to provide support, the family element was found to enhance the outcomes of the intervention.

## **4g. What factors predict involvement?**

Being physically active or already involved in sport in the first place is clearly associated with more success in interventions (Bernard et al., 2015; Firth,



Rosenbaum, et al., 2016) but Bernard's review also found that people who had higher ratings of their physical self-worth, perceived physical condition and body attractiveness also were more likely to have success.

### **Motivation**

Motivations to improve general physical health, fitness and body image were identified by Firth and colleagues' systematic tool which they developed to extract information on the motivational elements of physical exercise for severe and enduring mental health problems (Firth, Rosenbaum, et al., 2016). The psychological benefits were also identified including reducing stress and managing mood, improving sleeping patterns, enjoying exercise and increased self-confidence.

The social side of exercise was rated lowest in all motivations. Josefsson et al.'s review (2014) included one study that included a motivational component in the exercise programme design and the benefits with significantly better outcomes in depressed symptoms, they conclude that exercise may be recommended for people with mild and moderate depression who are willing, motivated and physically healthy enough to engage in a programme.

Lederman's (Lederman et al., 2017) review of practical applications of physical activity interventions within Australian settings found that champions within an organisation to support staff and management will help along with formalised partnerships and strong referral pathways with community organisations to encourage shared care.

Champions were empowered to develop the programmes and capacity and capability maximised through recruiting student placements. Culture change within mental health facilities needs to be encouraged to recognise the potential of physical activity interventions. These interventions were also found to be safe, low cost and easily evaluated to improve translation to other settings.

Social support and marital status at baseline were directly associated with better outcomes (Schuch et al., 2016) in a small number of studies of limited strength.

### **Gap in knowledge regarding the mental health benefits of exercise**

There appeared to be less of an understanding among participants in the studies around the mental health benefits of physical activity as opposed to the physical health benefits. Education regarding the many benefits of exercise, including its role in dealing with psychiatric symptoms was raised as a recommendation (Bassillo et al., 2014). Though some participants had a base level understanding of the biochemical reactions/releases during exercise, there was a general desire to know more of the theory behind sports therapy (Crone & Guy, 2008).

There are various ways in which this knowledge can be imparted, for instance via information packs (Jones, Harris, Waller & Coggins, 2005) or through education sessions that can sit alongside a more formal exercise programme (Wynaden, Barr, Omari & Fulton, 2012). Greater education for GPs and nurses regarding the mental health benefits of exercise might also be beneficial in





enabling them to better understand the evidence base around physical activity and mental health, thus allowing them to promote physical activity to their patients with greater confidence (Stanton, Franck, Reaburn & Happel, 2014; Faulkner & Biddle, 2002).

### **Gaining satisfaction and a feeling of accomplishment in developing skills**

A recurring theme from studies was that participants experienced positive feelings related to a feeling of achievement, acquiring new skills and seeing their skills improve (e.g. Carless & Douglas, 2007; Firth et al., 2016; Hodgson, McCulloch & Fox, 2011; Searle et al., 2014; Wynaden, Barr, Omari & Fulton, 2012), therefore the intervention might benefit from having a physical activity in which participants can develop their skills over time. Hodgson, McCulloch & Fox (2011) stated that this learning of new skills is a way in which participants can gain confidence, helping them to overcome initial discomfort or a general sense of inadequacy.

Firth et al. (2016) discussed that a moderately difficult or challenging exercise is beneficial in providing participants with an immediate sense of achievement as their ability develops. Zhang's review (Zhang & Chen, 2018) of a range of exercise interventions and designs showed a consistent positive relationship between physical activity and happiness but more research is required to explore how the mechanism works, the optimal dose and type of physical activity for gaining the benefits of happiness.

## **4h. Conclusion**

Exercise can help many people with severe and enduring mental health problems by helping to reduce symptoms and develop coping mechanisms but the effectiveness of a physical activity intervention will depend on many different factors.

Clearly a tailored and individualised programme will provide the greatest potential to gain benefits, delivered with the support of appropriately trained and sensitive professionals, within a supportive social network and with the required level of intensity and programme length to sustain benefits over time.

Other therapies delivered as an adjunct to exercise also seem to be important.

The findings from this rapid literature review, the expertise of PTI and feedback from our co-researchers and participants, helped to inform the design and development of our intervention.

Our intervention incorporated many of the suggestions evident in the literature including having suitably qualified trainers and developing a programme that was tailored to the different abilities of participants.

## 5. Methodology of the research study



***Ethics for the research study 'Empowering people through physical activity' was approved by the Research Ethics Committee of the School of Social Sciences, Education and Social Work at Queen's University Belfast.***

### 5a. Research aims

Via a co-produced and co-researched approach this study set out to:

- increase our knowledge about what works to engage people with lived experience of severe and enduring mental health problems to a level that is improving and protecting their physical health
- identify the facilitators and opportunities that help engage and empower people with severe mental health problems in physical activity
- explore the current barriers to physical activity.
- improve our understanding of physical activity interventions in mental health and help provide practical solutions that will improve the delivery of services in Northern Ireland.

### 5b. Selection of co-researchers

A central aspect of the research was using a co-production approach involving the expertise of a team of co-researchers with lived experience of mental health problems. Co-production is a concept that acknowledges that no one group or person is more important than another group or person (Boyle, Slay, & Stephens, 2011; Slay & Robinson,

2011). Within a research context, this approach seeks to recognise that everyone is equal and has skills, qualities and attributes to bring to the research process. In terms of this report, we will use the terms 'co-researcher' to describe the new team of researchers with lived experience recruited for this project and 'academic researcher' to describe the research staff from Queen's University Belfast, the Mental Health Foundation and Praxis Care who have received research methods training and have been employed in a research capacity across a number of different projects.

The co-researchers were recruited through an open recruitment process by Praxis Care. They all attended a two day training programme in December 2018 with content delivered by members of the research team at Praxis Care (Webb), QUB (Davidson and McCartan) and PTI (McArdle). A third training day was held in January 2019 delivered by a member of the project's Advisory Group and AWARE NI (Anderson) and QUB (Best). The training included an overview of the research project (roles and responsibilities); introduction to research methods; interviewing skills; research ethics; managing difficult situations; self-care; analysis; report writing; the benefits of physical activity for mental health; and using motivational cognitive behavioural



techniques. The training provided opportunities for role-plays and reflection to prepare the co-researchers for a range of potential scenarios during fieldwork.

We also used this time to help develop some of the interview questions, approaches to data collection and also agree collectively how to progress the project and the most effective ways of keeping in contact with the team.

## 5c. The co-researcher team

### Rebecca Blenman

I am 22 and I graduated from Queen's University in 2018 with a BSc Psychology with Honours and am currently studying for my MSc Applied Psychology (Mental



### Co-researcher Training, December 2018 – Queen's University Belfast

(Left to right: Karen McCready (Co-researcher), Lee Havern (Platinum Training Institute), Lisa McKee (Co-researcher), Rebecca Blenman (Co-researcher), Paul Webb (Praxis Care), Aodán Mulholland (Co-researcher), Claire McCartan (QUB), Andrew Farara (Co-researcher), Katherine Greer (Co-researcher), Liam Bradley (Co-researcher), Gavin Davidson (QUB)).



Health and Psychological Therapies). My research experience consists of my undergraduate dissertation which looked at risk-taking behaviours in the dark triad of personality and a study which looked at mental health in the modelling industry for my placement module in final year.

My interest in mental health has developed throughout my university education and this project has provided me with experience in analysing qualitative data and working as a co-researcher. The role of co-researcher appealed to me because it allows the opportunity for people with experiences in mental ill health to give their own knowledge and insight to a project which focuses on this area.

### **Liam Bradley**

My name is Liam Bradley. I have spent over 30 years in a demanding healthcare role. I had always been something of a fitness fanatic taking part in triathlons, kayaking and ju-jitsu. I undertook these activities more in a competitive way than as a wellness tool. When my mental health deteriorated in recent years, one of the first changes was that my motivation for physical activity fell away. This seeming lack of ability to exercise led to weight gain and further contributed to mood deterioration.

I was interested in the relationship between motivation and mental health difficulties and I heard about the DRILL



project through the Recovery College. The insight gained from being involved in the project has helped me with self-discovery which is an ongoing process. I now do much less "exercise" and much more physical activity. I have a dog who loves walks. I tend both my own and my mother's garden, wash my and my wife's car myself and I always stop and ask myself 'Can I do this short journey on foot?' rather than automatically start the car. This activity helps maintain a level of suppleness, strength and stamina although I do hope to get back to group activities.

I hope my own experience has allowed me to have empathy with service users and to offer insight to the project leaders.

### **Andrew Farara**

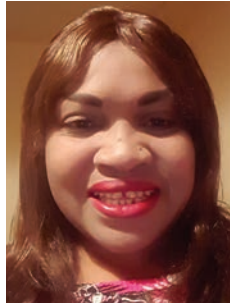
I have worked with other research colleagues as a co-researcher on the physical activity project. I have really enjoyed it and have met new people. I feel that this project has improved my self-confidence and I would be more than glad to work with the team again if the opportunity arises in the future. It has been a great, fantastic opportunity which I have grasped with both hands.

I have also really enjoyed the variety of people who I have met as well as all of the individual personalities. I found the data analysis very interesting and a steep learning curve which I enjoyed! The physical activities were good too!



### Joanne Freaney

My name is Joanne Freaney. I was born in Nigeria on 29/09/1976. I come from a family of 8. My father was a working middle class person in the police force in Nigeria and my Mother was a seamstress, I come from the Delta state of Nigeria, the village is called Utchi.



My interest in mental health is phenomenon as I suffer from Mental Health sickness myself. I got involved as a co-researcher to know more about the sickness and how to combat the stigma and segregation that comes with it.

My interest in physical activity is great cos I like to feel fit and get all the benefit that comes with it. I am stress free after every session of physical activity and it has impacted on my health in a very positive way. In the past after undergoing physical activity I lost 3 stones and went from size 16 to size 12.

I am proud to say that I'm able to walk long distances now which was impossible before cos I get breathless. I think the project is beneficial cos the research will give the population an insight on the effect of physical activity on people suffering from mental health sickness.

As a co-researcher I think the job is very enjoyable and interesting and also very beneficial. I've enjoyed it so far.

### Katherine Greer

I am 59 years old. I was born, lived and educated in Ballymoney until my marriage in 1984. I relocated to Coleraine where I continued to work in Coleraine/ Causeway Hospital where I began in 1982. I had two children, Iain born in 1985 and Megan in 1988.



I continued my academic career through work achieving an MSc in Social Administration and Policy in 1991. Then I retired on the grounds of mental health in 2006. With counselling from my psychiatrist, GP, the Eating Disorder Team and Praxis Care, I am back in recovery but still struggle.

I became aware of the co-researcher position through Praxis Care where I attend weekly classes. I had enjoyed research at university and I felt I would be able to physically and mentally cope with the challenge.

A co-researcher can contribute with having the reality and experience of living with mental health problems. They can bring empathy, accuracy, meaning, warmth and depth to the project.

As a co-researcher, I have grown in confidence, self-worth, self-respect and feelings of achievement. I am a valued member of my society, not a person of a sub-culture, labelled 'mentally ill'.

### Karen McCready

My name is Karen McCready and I am 49 years old. I have had a lifelong interest in learning disability and mental health, often acting as an advocate for my brother. Six years ago, my daughter was diagnosed with OCD and, alongside her, I have fought her battle for better mental health. I have seen, first hand, the value in keeping active, being among others and having goals.



I really wanted to become part of this research team as I anticipated it would be very interesting and educational, furthermore I have always had a passion for exercise and keeping fit. I met really positive service users over the one year's research and had great fun and laughs many of the times.

The experience working with the Queen's University staff and Praxis was excellent and I would love to work with these very enthusiastic people again.

I am delighted to be part of this project, as a co-researcher. Having lived experience of mental health creates empathy and understanding, which can bring value to this work.

Being involved has also helped me on my journey and long term aim to work in this area. Since joining this group, I have become a Board member of a voluntary group, supporting adults with mental health.

## 5d. Selection of participants

Research participants were recruited from Praxis Care through Paul Webb, their Research Manager. Praxis Care units were selected which were known to be working with people who met the study selection criteria.

Paul Webb contacted senior staff within each unit who were able to assess the level of service user interest. A poster was also distributed to all eligible units and staff discussed the study with potential participants at unit meetings.

### Aodán Mulholland

My name is Aodán Mulholland I have always had a great interest in Social Care, especially mental health. I studied at Ulster University and got a degree in Health and Social Care Policy BSc. I then obtained employment in the Health and Social Care sector, working with individuals with learning disabilities and metal health issues.



Paul Webb then visited each participating unit to talk to those interested about the study and to distribute a participant information sheet.

## 5e. Brief description of the participating Praxis schemes

A number of services were selected for inclusion in the study including: supported housing; flat clusters; floating support; group work services; and carers' advocacy.



### Report Writing Day, 15th October 2019 – Queen's University Belfast

**(Back row:** Gavin Davidson (QUB), Andrew Farara (Co-researcher), Aodán Mulholland (Co-researcher), Paul Webb (Praxis Care), Rebecca Blenman (Co-researcher), **Front row:** Liam Bradley (Co-researcher), Joanne Freaney (Co-researcher), Katherine Greer (Co-researcher), Karen McCready (Co-researcher), Claire McCartan (QUB)).

## 5f. Design and procedures

### Co-production and the co-research approach

In practice, we applied the co-production approach in a number of different ways:

#### Developing and agreeing the measures to be used

During the two-day training workshop, we discussed and piloted the measurement tools we had drafted in preparation for the training. This helped to assess whether the measures were easy to administer and whether they gathered enough detailed information. It helped to introduce the tasks involved in the study as some of the co-researchers had not been involved in research

before. The selected tools included a number of standardised measures and some qualitative questionnaires that had been developed specifically for the project.

Some of the measures we proposed stimulated much discussion and debate. This is one example where the skills and experience of the co-researchers highlighted potentially problematic questions that the 'academic' researchers had not considered. Questions about a person's social network, the level of support of friends or family could be considered insensitive or traumatising as many of the participants could be experiencing social isolation because of their mental health condition. Other questionnaires, for example the EPIC-Norfolk Physical



Activity Questionnaire (EPACQ2), were deemed too long, repetitive or too intrusive and therefore deemed inappropriate for our data collection. We then went through a process of developing a new questionnaire which included questions suggested by both peer and academic researchers and agreed and piloted a final version (Appendix 4).

### **Scheme inductions**

The co-researchers also accompanied members of the academic team to brief and recruit schemes. They introduced the project aims and objectives and talked to potential participants to encourage their involvement; many also shared their own experiences of mental health service use. A couple of co-researchers already had existing contact with some of the recruited schemes. This existing relationship proved beneficial and encouraged a sense of trust and legitimacy with potential participants.

It was also invaluable in bringing insider knowledge to some of the more practical elements of the programme delivery including room size, key contacts, frequency and duration of existing meeting schedules or scheme routines.

### **Programme development and delivery**

The programme was a health-focused physical activity intervention following the NICE guidelines for clients with mental health conditions and the FITT principles (Frequency, Intensity, Time and Type). We wanted to focus on the social aspect as well as

improving functional movement and proprioception and so decided upon a group-based exercise delivery model. Exercise prescription was a three-tiered approach; Beginner, Intermediate and Advanced with an opportunity for progression depending on participants' risk stratification, mobility and co-morbidities. The individual abilities of the participants were identified during face-to-face pre-screening and assessed throughout the programme.

Participants were risk stratified in accordance with their mental health condition, PAR-Q+ (Warburton, 2011) screening, data from Northern Ireland Chest Heart and Stroke and co-morbidities. Current medication and their effects were also considered which prompted an emphasis on improving proprioception, limb coordination and core stability.

There were many concomitant issues which meant exercise had to be carefully monitored to ensure that risk to participants was reduced. Due to the many different co-morbidities, exercise was chair-based with an option to add in resistance bands as participants progressed. A table was provided for each trainer to ensure that participants were neither under-challenged nor over-reaching in terms of ability to participate.

Programmes ran for a total of 12 weeks with one one-hour individual or group session per week with the trainer. Information booklets detailing the range of exercises were issued to participants during the programme.

Individual sessions were co-ordinated by the trainers using the individually





tailored exercise manual as a guide to encourage participation and progression for all and also ensure variety. The qualifications held by the trainers included Level 3 Diploma in Personal Training, Level 3 Diploma in Exercise Referral, Level 4 Award in Physical Activity for Adults with Mental Health Conditions, Level 4 Cancer and Exercise Rehabilitation, Level 4 Cardiac Specialist Instructor Course. Along with these qualifications they also had a wide range of experience and passion for helping others.

### **Programme participation**

Most co-researchers chose to attend the weekly sessions in the schemes. Being a positive role model and demonstrating progress along the recovery process was considered to be an important aspect of being a co-researcher.

Regular attendance and participation also encouraged establishment of positive relationships, extending the social networks of participants and helping to make the activities fun and engaging. This development of positive relationships was also beneficial during data collection for the focus groups and interviews.

### **Data collection**

Co-researchers were supported to collect data and led focus group interviews where possible. The relationships built up over a number of weeks helped to create a relaxed and non-threatening atmosphere which benefitted the facilitation of the focus groups.

## **5g. Outcome measures**

This study required us to collect quantitative data on participants, which involved a NICHS Well Check and an initial screening by PTI using the PAR-Q+ interview (Warburton, 2011), before and after the intervention. The qualitative data collection consisted of focus group interviews with participants at each scheme. A physical assessment of participants was collected at baseline and post-intervention following the 12 weeks of the physical activity programme.

### **Well Check**

Developed by Northern Ireland Chest, Heart and Stroke, the Well Check (Appendix 1) captures baseline physical data on a number of metrics including BMI, blood pressure, pulse and cholesterol and highlights other potential risk factors including family history of cardiovascular disease, high cholesterol, high blood pressure, diabetes and current lifestyle behaviours such as stress, diet, alcohol use, smoking, sleep and activity levels.

This information is used to help identify areas of improvement of health behaviour and each person is encouraged to set goals to make healthy lifestyle behaviour changes.

### **PAR-Q+**

The physical activity readiness questionnaire (PAR-Q+; Warburton 2011) (Appendix 2) is a pre-participation screening and risk stratification strategy tool that can be used by anyone planning to start an exercise programme. It is often used by fitness trainers or



coaches to determine the safety or risk of exercise for an individual based on their answers. The PAR-Q+ has been designed to identify the small number of adults for whom physical activity may be inappropriate or should seek medical advice to recommend the type of activity most suitable for them.

### **Focus group schedule**

This was developed and piloted during co-researcher training and covered general questions about current levels of activity, personal histories of activity dating back from school to present day and explored some of the barriers and facilitators to participating in activity (Appendix 3).

A total of six focus groups and interviews were held across the scheme sites including a focus group conducted with the personal trainers involved with the project, this was led by Sports and Exercise Psychologist, Dr Gavin Breslin from Ulster University. Across the interviews and focus groups, 20 service users participated, along with three PTs/coaches, three peer researchers and two Praxis Care staff members.

### **Stakeholder interviews**

A second element of this report were the stakeholder interviews to explore issues around the content and design of the programme. For further detail on the interviews conducted with stakeholders and the findings, which have informed our report, please see Appendix 5.

## **5h. Data analysis**

Data analysis was led by Dr Paul Best from QUB and employed a Participatory Theme Elicitation (PTE) methodology (Best et al., 2017). Developed to engage lay researchers, PTE is used to identify common groupings or themes within qualitative data. Network analysis techniques are then used to construct groupings and highlight patterns in the data.

This method has been used successfully with other co-researchers and offers a simple but meaningful way to involve people in qualitative data analysis within a relatively short space of time. The PTE method involves a five-step process and will be described in detail below.

## 6. Quantitative findings



***Below are the pre- and post-intervention quantitative findings from the NICHS Well Check and the initial screening by PTI using the PAR-Q+ interview (Warburton, 2011).***

### Quantitative baseline

These data formed the basis of identifying potential participants that had underlying health issues and were advised to check with their GPs before starting the programme. This was also a requirement for the PTI trainers' insurance.

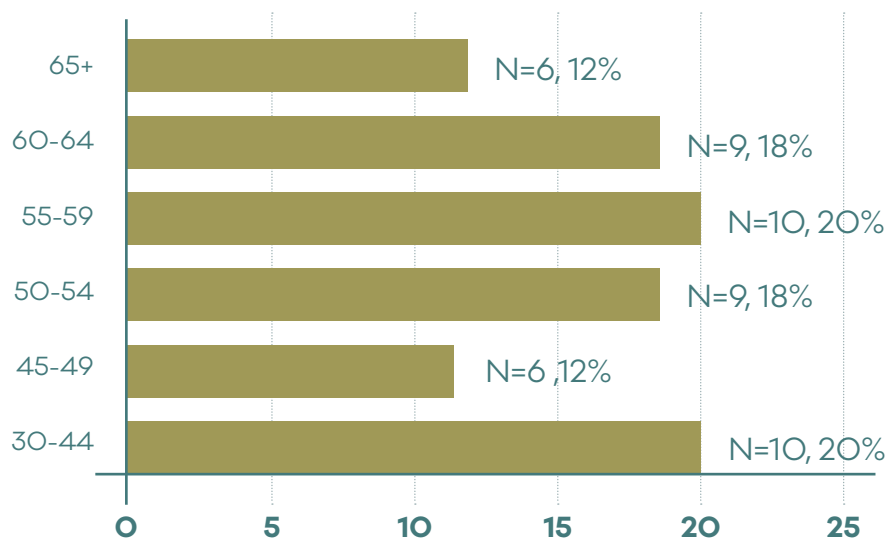
research team who had anticipated that it would be difficult to recruit interested people. Of the 66 people interested, 58 received screening from PTI and NICHS. The Well Check takes 30 minutes per person and some effort was made to schedule assessments across each site and manage the volume of participants.

### Profile of initial recruitment of participants

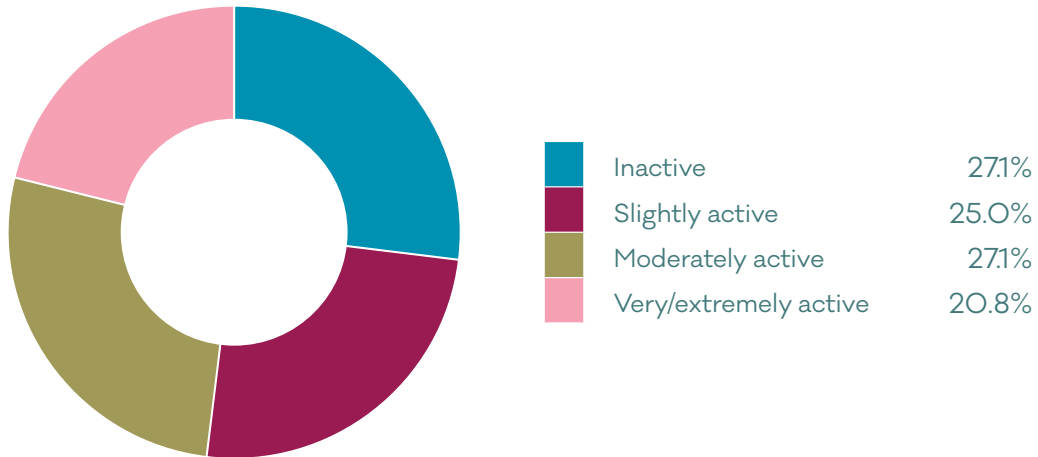
Sixty-six people were interested in being involved in the project after the initial recruitment visits to each site. This was contrary to the expectations of the

Assessments were run over consecutive weeks for some of the larger groups. Some people were not available for assessment and while every effort was made to reschedule appointments, a total of n=16 did not receive a Well Check.

**Figure 1: Age profile of Well Check participants**



**Figure 2: Activity levels of Well Check participants**



## Baseline

### Gender and age

At baseline, 62% of screened participants were female (n=31). The sample ranged in age from 30 years to over 65 years old. Self-reported measures of activity levels indicated that over half of participants described themselves as being inactive (27.1%; n = 13) or slightly active (25.0%; n = 12). On the more positive side, almost 49% were moderately or extremely active.

The Body Mass Index (BMI) is a measure that uses your height and weight to work out if your weight is healthy. For most adults, an ideal BMI is in the 18.5 to 24.9 range. The mean BMI for the total sample was over 31 (M = 31.91 (SD = 8.06)) and ranged from 22 to 69. 78.6% (n = 44) of participants had a BMI of over 25 and 60.7% (n = 34) of participants had a BMI of 30 and over. Total cholesterol measures the amount of cholesterol in

your blood, recommended cholesterol levels should be below 5. In our sample, mean total cholesterol was below 5 (M = 4.78 (SD = 1.09); range 3.04 – 9.24).

NICHS also assessed the ratio of total cholesterol to HDL. A ratio of under 4 is usually regarded as a sign of healthy cholesterol levels. The mean Ratio of Total Cholesterol to HDL score was under 4 (M = 3.68 (SD = 1.17); range 2.07 – 7.43). A total of 18 participants had a ratio of over 4.

### Other lifestyle behaviours

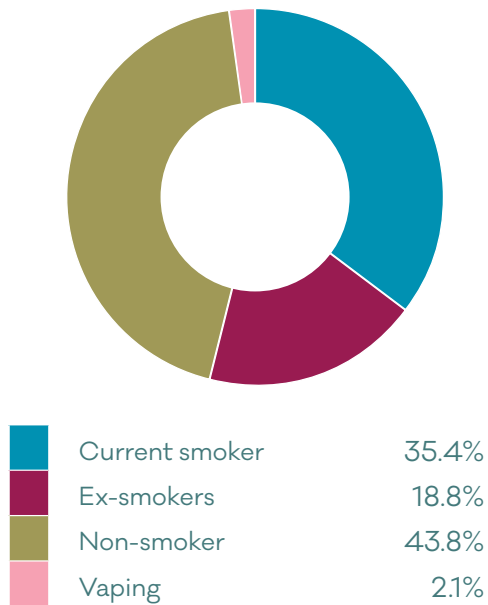
#### Smoking

Over one third of participants were smokers, almost 20% had given up and 44% were non-smokers.

#### Alcohol use

The majority of those screened described themselves as non-drinkers/no response, however 10% of participants reported heavy or excessive drinking levels.

**Figure 3: Smoking behaviour of Well Check participants**



**Figure 4: Alcohol use of Well Check participants**

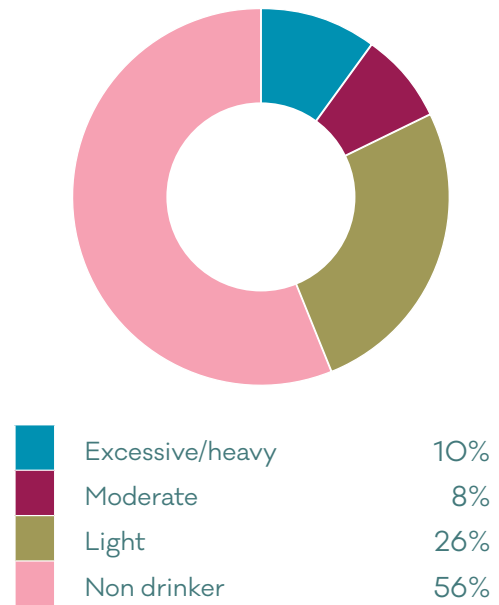
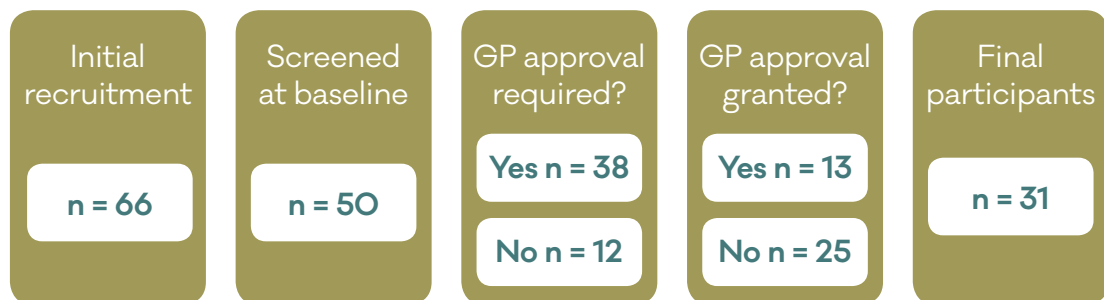


Figure 5 details the number initially recruited to participate, how many were screened by both NICHHS and PTI and the number requiring and securing GP approval. A total of n=31 people regularly participated in the programme across the five sites.

**Figure 5: Flow chart of scheme recruitment and participation rates**





Of the 50 screened, 76% required GP approval to participate. Just over one third of those needing approval were unable to get this from their local surgery. A combination of reasons was offered for this: not something a GP could do; no time; additional cost.

The Mental Health Foundation offered to cover the costs of the GP approval letters (ranging between £15-30 per person). PTI also provided a detailed checklist which outlined the specific activities and exercises that might be undertaken in order to provide GPs with more information (See Appendix 3) but this proved to be a barrier for a number of people wishing to participate.

**Post-intervention quantitative data**  
In contrast to the 58 participants that received the NICHS Well Check prior to the intervention, only 8 received the Well Check after the intervention took place.

Given such limited post-intervention data, a quantitative analysis between the two time points would not provide any useful comparison.

Future programmes would benefit from greater consideration around how to encourage participants to undergo Well Checks or similar health checks after the intervention has taken place.



# 7. Qualitative findings



## 7a. Qualitative approach

As outlined previously, participatory theme elicitation (PTE) was used to involve the whole team in the data analysis.

The analysis was undertaken over two consecutive days: sorting task (day 1) and group discussion and identification of key themes (day 2).

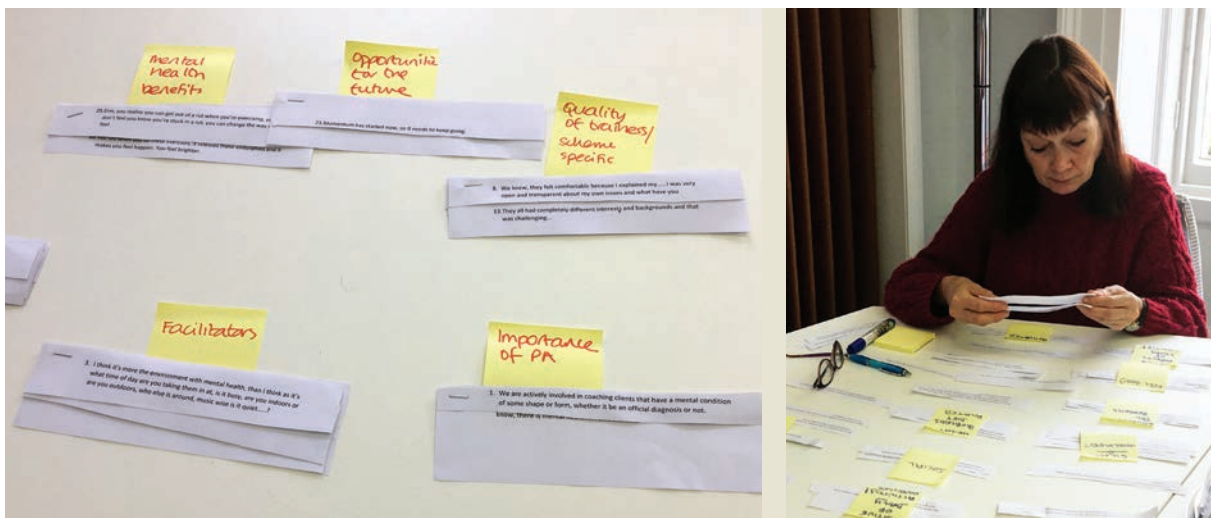
### 1. Identification of key or standalone quotations from the interview data

This task was undertaken by two independent researchers who are not involved in the day-to-day running of the project (JY & CW). They were given a set of the transcribed interviews and asked to scan the data for key quotes or standalone statements that emerge from the data. These key quotes or statements were used to conduct the sorting task.

For this project 89 individual quotations were selected from the data.

### 2. Identification of overarching set of groups or themes

Four co-researchers were given a full set of the 89 standalone quotations/statements (LB, AF, JF, KG). These were cut out into 89 separate strips of paper and the co-researchers were asked to sort them into groups. The researchers were asked to think about their own categories and groupings and the quotes were sorted individually by each co-researcher. A second group of four researchers conducted the same sorting task; this comparison group was made up of more experienced researchers from QUB (Paul Best, Trisha Forbes, Claire McCartan) and Praxis Care (Paul Webb). The categories and groupings were not discussed at any stage during the sorting task.



The sorting task.



A sample of the quotes being sorted by co-researchers Katherine, Liam, Joanne and Andrew.

### 3. Network diagram of themes/ groups

Using a software programme (available at <http://www.ptegroups.net/main.html>), the groups identified by each of the co-researchers were combined into an overall set of groupings.

A spatial clustering method was used to assign similar items and detect 'communities' within the network. These groupings or communities were plotted as a network diagram, representing how similar quotations were selected across the co-researcher group and were clustered together.

The network diagram that was produced gave a visual representation of how the quotations had been sorted at a group level.

The network diagrams produced by both sets of sorters (co-researchers and academic researchers) were slightly different and while there were 3 (co-researchers) and 4 (academic researchers) key groupings identified in the network analysis, discussion broadened these out into 10 different thematic areas.

### 4. Discussion of themes

Each group independently discussed the groupings that the network analysis produced and names for these groupings were agreed. This group discussion was facilitated by Chris White (co-researcher group) and Jade Yap (researcher group).

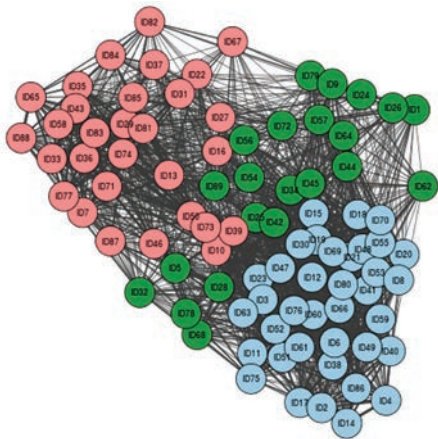
### 5. All group discussion of themes

Both teams met together, and we agreed a final group of themes based on the network analysis results and group discussions.

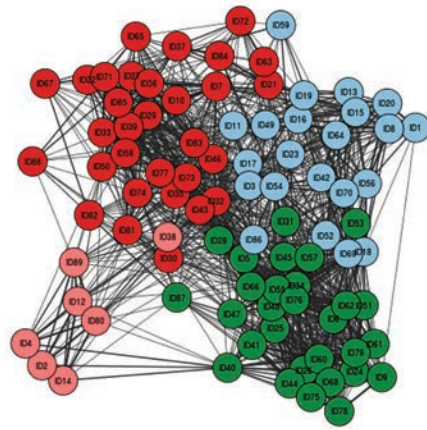




**Fig 1: Co-researcher Network Diagram**



**Fig 2: Researcher Network Diagram**



The network diagrams: each individual quotation is represented by a unique code (ID1-ID89). The greater the thickness of the lines between 2 quotes (or nodes) indicated the greater number of researchers grouping similar quotes together.



Jade explaining the researcher group discussion to the rest of the team.

## 7b. Results: thematic analysis

Using the methodology Participatory Theme Elicitation (described above), the peer researchers analysed data from the focus groups and developed a list of key themes and subthemes. The effects of physical activity are first discussed and the growing awareness and knowledge around this.

A key facilitator for participants to attend and engage in the programme appeared to be the social element which is explored. We also intended to focus on the barriers to participation as part of our research aims and these – both psychological and practical – are explored as well in this section.

**All names of participants are pseudonyms.**

### The benefits of physical activity



Peer researchers and participants during a walking activity.

## Recognition of the benefits of physical activity

Participants were very familiar with the benefits of being physically active and were able to talk extensively about the range of advantages to being active.

These included both improvements in mental health symptoms and physical health gains.

### Effects on mental health

#### Mood

Mental health effects were multifaceted. The specific concept of a physical ‘lift’ in mood was mentioned by four different participants across three of the sites. The effects were described as ‘lifts your mood’, ‘lift the mind’, ‘I felt a got a lift’,

*“see when these wee things come up, 12 weeks of activity? It is an absolute mind-lift, it really is...”*

Nicola, carer, city setting

A number of those interviewed talked at length about feeling happier or getting a high and the association between activity and the physiological effects of endorphin release were well understood. These positive feelings had, in turn, contributed to respondents looking forward to aspects of their daily lives.

#### Cognition

Aside from the lift in mood, being active also led to improvements in day-to-day living. People talked about having a ‘clearer head’, feeling more ‘alert’ benefiting their decision-making and improving focus. One participant asked the researcher,



***“I’m more rational and more alert now. Can you tell the difference in me?”*** Roisin, supported living, city setting

Improvements in cognition also helped with some of the other symptoms connected to their condition, including feelings of depression and decision-making about other lifestyle decisions:

***“It helps your depression, you feel more with it, you know?”*** Rory, supported living, rural setting

***“For some reason something’s just clicked in my head... it’s like a light went on... if you said to me now there’s a banana or a bar of chocolate, I’d take the banana”***  
Roisin, supported living, city setting

Improved decision-making also led to other changes being made, specifically around developing a new structure to the day which was beneficial.

### **Establishing new routines**

Being more active led to new routines being established.

Participants talked about setting the alarm clock or getting out of bed earlier to attend the activity session, a number spoke about feeling more energized and as a result were capable of doing more in the day,

***“Yes, the rest of the day when you get home. You’ve got more structure there, cos you haven’t been lying in bed, you know you’ve got this to do and that to do, you’ve had your wee exercise and you feel more regenerated or something”***  
Rosie, carer, city setting

This often extended into the rest of the week,

***“I was able to do more not just particularly on a Wednesday but other days”*** Katherine, carer, city setting

Similarly, those who missed the sessions were disappointed with the disruption to their new routine, a routine that had helped to break ‘bad’ habits that were not beneficial,

***“It gets you up and it gets you out and about. If you sit about the house, your head goes”*** Sean, drop-in support, town setting

### **Coping skills and helping to manage stress**

Another perceived benefit was the impact that being more active had on their ability to cope, particularly for those who were caring for others.

The group of carers viewed the weekly activity programme as something to share and enjoy; this in turn bolstered their ability to cope when they went back home to their heavy caring responsibilities,

***“We all have our moments and our weaknesses, whenever we struggle... I think for all of us, it’s got us motivated to feel a lot better about ourselves and then with the situations at home, when things you know get that wee bit rougher, you’re able to cope with it better... well, I know I have been able to cope with it better”***  
Nicola, carer, city setting



Feeling less stressed was also recognised as a benefit for those with experience of anxiety or depression.

## Psychological effects

### Self-esteem & confidence

Many members of the group had not been physically active for many years and for some this was bound with feelings of insecurity and low self-esteem over their physical appearance (feeling overweight, unfit) or fear of injury or failure.

This was something the experienced trainers were well aware of as one explains,

*“I also think a lot of them have got...oh I can’t do that and we did it, and they’re like, oh I can do that! So, I think where previously had thought they couldn’t walk to the corner shop and back, they were realising that they can. So, it’s kind of giving them that wee bit of confidence and a wee bit of self-belief that they can do it and maybe pushing themselves that wee bit harder, it wasn’t going to make them any more ill... I think there was a fear around doing too much.”* Trainer

*“I’m so proud of myself.”*  
Geraldine, supported living, city setting

### Behaviour change

Changes to routine have already been discussed but the activity also triggered other areas of behaviour change relating to increasing physical activity levels,

adjustments to diet and other lifestyle behaviours. Geraldine explains how she has begun to make changes in her life,

*“I’ve like come to the stage where I have two options: get fatter or slimmer so my diet has changed, my exercise has changed, my mood has changed and my thoughts has changed, so thanks to everybody who’s supported me, I feel that exercise is beneficial to me”* Geraldine, supported living, city setting

Some participants wanted to continue the various activities at home and bought affordable equipment (e.g. resistance bands) they had been shown how to use by the trainers. Getting active also prompted renewed interest in other activities that they perhaps had been involved in, in the past,

*“I used to play badminton... I would like to start that again. I might take up five-a-side football as well. I was on gumtree and there was a fella looking for a player so I might take that up again”* Rory, supported living, rural setting

Small changes to behaviour were also considered important and the trainers understood the significance of taking small steps in order to set realistic and achievable goals. While weight loss was a significant goal for a number of service users, the trainers took an individualised approach to goal setting,

*“It was like, look don’t worry about that, that will come. Your goal is to turn up every week, to try and get here every week regardless of whether you’re having a good day*



*or bad day. Simple things like getting up and down from the chair with ease and even on a bad day, still being able to get yourself up and get yourself to the kitchen and back and do things. That was the goals we were trying to re-focus them on and take it out of this kind of exercise and fitness, has this massive... you have to lose weight, you have to look a certain way. Taking those goals out of it and making it more about life-style changes and improving the quality of living.”* Trainer

Other elements of what might be lifelong habits were also raised. One participant spoke about their smoking habit which they found particularly difficult to break,

*“I’ve been smoking for umpteen years and it’s hard not to be going into the shop and buying a packet of cigarettes. It’s hard to do that like, you know?”* Rory, supported living, rural setting

These experiences highlight the challenge of building healthy habits to replace less healthy ones. It is evident that there is a need, more broadly, to focus a range of efforts on improving physical health for people with serious mental health problems.

### **Self-care**

The importance of self-care was an area to emerge from the analysis. Service users were starting to think about their physical health and not just their mental health. Having a specific time set aside each week gave participants the opportunity to concentrate on their physical health during that session and appeared to

stimulate thought and discussion about the importance of making time for thinking and taking practical steps towards their own physical health. Having a time slot each week, sectioned off from other responsibilities, helped to create a focus on self-care, trying to increase positivity and the importance of making time for yourself. The weekly physical activity programme allowed an opportunity for this,

*“you kinda made time for it, didn’t you?”* Sandra, carer, city setting

### **Physical health effects**

There were physical effects to people’s reported health too. Improved sleep and increases in energy levels were described,

*“Medication makes you tired but the more you exercise, the fitter you get”* Michael, supported living, rural setting

Some participants felt fitter, even after the relatively short period of intervention, and there was a definite sense of progress being achieved as each week went by. Participants reported increased capacity and stamina and a reduction of physical symptoms including joint pain and perspiration. Whether this can be attributed to the programme or not, participants were generally feeling more positive about their mental and physical health,

*“There’s 6 aisles [in the supermarket] and I’m normally in a sweat, piling off me, but see since I’ve started eating healthily and exercising... and I went up and down, normally I’d*



*be stopping, I'd have to sit. You know, on one of those wee stools? I'd have to sit down but I didn't stop once."* Geraldine, supported living, city setting

## The social aspect of physical activity

The social aspect appears to have been significant for many of the participants and was mentioned in a range of different contexts.

### Motivation

Engaging in physical activity within a group setting was motivating – not only was it more enjoyable but it also meant that it wasn't as easy to give up.

*"When you are in a group, you have more motivation because everybody around you is doing it."* Nicola, carer, city setting

*"If you are doing it on your own, it's easy to stop"* Maggie, drop-in, town setting

*"You know when you go out, nobody wants to say I had to turn back or something, everybody just goes"* Rosie, carer, city setting

### Sense of belonging

Both the trainers and participants identified the importance of the social element of the physical activity intervention as strengthening the dynamic among the group of participants, helping to foster a sense of belonging and connectedness. The focus groups highlighted that having a

sense of community, whether this was pre-existing in established groups or developed in newly formed settings, was vital to the success of the programme.

*"there's very much a community spirit already established with them, but it's carried into our groups. It makes our role with them so much easier."* Trainer

### Reducing social isolation

The trainers also found the social setting beneficial for engaging the group. Where there were difficulties socially between individual group members, this created problems where perhaps a one-to-one setting would have been better.

For those who may have been socially isolated, the trainers identified that the activity group created opportunities to meet new people and increase social contact. Here, the physical activity benefits were secondary to the social interaction,

*"I think <name removed> got a social aspect from it, from us coming in and he was very interested in where are you from and telling you about his life. For him I felt that even an hour of company, of somebody different, was very beneficial to him."* Trainer

### Barriers to physical activity

#### Medication/diagnoses related

Symptoms relating to prescribed medication or the diagnosis of participants was identified as a key barrier. Service users reported the impact of heavy medication on their physical reactions including extended fatigue;



excessive perspiration; poor levels of concentration; and increased appetite.

***“I’m just that fatigued, you are not even concentrating on what you are doing, I want to go home I’m knackered you know that kind of way.”***

Peter, drop-in support, town setting

***“I think you’re more vulnerable with mental health because the mental health can make you feel hungry... you’re kind of eating and eating and comfort eating sometimes if you’re not feeling mentally well”*** Geraldine, supported living, city setting

The effects of medication have been well evidenced in the literature, but some people found it easy to deal with than others,

***“My doctor says, isn’t it better having the sweats every day you do exercise than going back to the way you were? I says yes, so I have to put up, you just have to put up with it.”***

Rory, supported living, rural setting

Lower motivation levels were also connected to diagnoses and something which had been eroded over time as their condition progressed.

***“Motivation, motivating myself to go for a walk... it’s something I would struggle with... it could be my diagnosis, bipolar, I don’t know.”***

Sean, supported living, rural setting

The trainers also recognised motivation levels as a problem area, particularly for some who were living in supported settings where the impact of mental ill health was more severe,

***“[City supported setting] was more of a challenge and it was a very different type of clientele than what you would generally work with. It was obviously more severe... I did find it was hard to keep them motivated and keep them committed to it... I think for me the biggest frustration was... turning up and they’re not there... or they’re sitting in their room and they just go, ‘nah, I don’t want to do it today’”*** Trainer

***“Yeah, yeah, it was a bit of an eye opening. I mean I’ll be honest with you, the first session, cause I didn’t really know what I was expecting type of thing. I came home and [my partner] said to me, well how’d you get on? You look absolutely wrecked, what were you doing? I said, I did nothing! It was mentally, for me it was quite mentally and emotionally draining, cause I didn’t really know... they had briefed us and yes we’d seen them all, a name and where they were in terms of screening on a piece of paper, but in terms of an actual individual and the way in which they were...”*** Trainer

The qualities and skills evident in this small group of professional trainers will be discussed in more detail later in the chapter but it was clear that the challenge of working with lower motivation levels required some consideration and a different approach,

***“I found it was more motivating [city supported setting] was very challenging and I think for me, I took from it that I’ll have... kind of learn more how to motivate people who***



*aren't very motivated and don't really seem to want to be there. Try to find other techniques to try and, you know... that's something I took from it, that I know I have to go away and work on myself."* Trainer

In their focus group, the trainers discussed the idea of a contract or appointment system to establish some sort of commitment to the programme at the outset. Service users also mentioned a lack of commitment from some potential recruits,

*"A lot of them... they do that round here, you know, they say 'we'll take part in this, that and the other' and then comes the day and they go 'nah'"* Sean, supported living, rural setting

The research team thought this would have been difficult to manage and may have been off-putting to potential participants, but the trainers concluded that the study's potential was compromised by a lack of commitment from some of the service users,

*"One-to-one, would that have increased their accountability... as an appointment? That they had to attend rather than it's just a wee thing I can go to, if I want to, I found that was the only frustration. [Lack of commitment] is understandable and that's ok, it's part of their mental health condition, but I think, it's maybe just getting that wee bit more commitment or before they sign up to the programme, at the start, getting that commitment... we don't feel that this is a true representation of what exercise can do for mental health*

*conditions because there's not been the commitment and the consistency to give fair results"* Trainer

Several participants reflected on how they active they had been in the recent past or much younger and the impact that a mental health crisis or the slow onset of the condition had, initiating the deterioration in their physical health,

*"I swam, I walked, I played camogie. I loved my fitness, I loved the fitness and the way it made me feel but when I got that job... I was working long, long hours in a depressed environment...my mental health deteriorated in there without me actually realizing it and I took a breakdown... but I didn't know, I thought everyone else was going crackers... so I was on a journey of mental health more than physical health... and then all of a sudden, as the years crept on, the size of me is over 10 to 15 years of eating. It just didn't happen overnight... but I'm not trying to blame it on the schizophrenia, but it didn't help being in [inpatient unit]"* Geraldine, supported living, city setting

One service user talked about his mental health as an 'affliction' which could impact hugely on every aspect of his life,

*"Mental health is a terrible affliction. If not controlled it can get out of hand – physically, mentally, emotionally, in every aspect"* Gerry, supported living, city setting





## Psychological barriers

Low levels of self-esteem and self-image were identified as a significant barrier to engaging in any type of activity, particularly perceptions about being overweight. This applied to both men and women in the study,

*“If you are going to go to the gym you feel self-conscious about your weight so it would deter you from actually going”* Sean, supported living, rural setting

People also could recall significant and negative personal experiences that had left them vulnerable,

*“People can be judgmental and they can ridicule you. They can judge you and make you feel bad about doing your exercise. You know when people say to you, sure look at you, you’ve put the weight on love and sometimes you get in your head and you think, god I can’t do it”* Geraldine, supported living, city setting

The trainers also spoke candidly about their own psychological conflicts with people’s expectations of how they should look,

*“In my own example for me when I was getting into this, because of my own anxiety and depression stuff, I used the think, ‘Jeepers do I look like a personal trainer?’ I had to question myself saying, what does a personal trainer look like? I had it in my head thinking a personal trainer has to be six foot, built like Arnold Schwarzenegger and then I realised, actually do you know what, it’s*

*nothing to do with how you... it’s the individual, it’s the person.”* Trainer

This insight was crucial connecting with service users, as Maggie describes,

*“They’re not turning around going like putting you down in front of anybody.”* Maggie, carer, city setting

The qualities and skills of the trainers involved in this project will be discussed later.

## Practical barriers

### GP approval

Frustrations were expressed by participants and trainers about the problems associated with GP approval to undertake low level physical activity. For those requiring GP clearance, this was not always straightforward.

Some GPs were willing to sign off for a small fee (ranging between £15-30); some consultations were delayed due to difficulty getting an appointment. Steps were taken to try and mitigate these problems (such as developing a detailed checklist of proposed activities or asking for service users’ consultant psychiatrist’s approval) but these efforts made little difference.

*“From the start, it’s GPs, that is the biggest frustration from day one. This project is behind months because of that. Getting clearance and the issue of the people who were on board straight away for what we’re trying to do here. So that would be the biggest frustration of the lot.”* Trainer



Although there was some sympathy regarding fear of liability or litigation, there was a counter-productive message being communicated,

***“The doctor won’t sign this or a doctor’s letters going to cost me £20 or something like that there. It doesn’t seem reasonable when really you can get them into exercise and long term, it’s going to reduce your NHS costs you know, so why are they asking for that?”*** Trainer

### **Time**

A considerable amount of initial groundwork was carried out by Lee and Naomi from PTI. They met and assessed each service user, designed the programme and produced the materials.

The detailed physiological data collected by NI Chest, Heart and Stroke was also invaluable in profiling each participant and informed the design of an appropriate programme. This preliminary work was valued greatly by the trainer,

***“The background work and the background checks, which Lee and Naomi had done, had all been put in place. So really that was the hard, mundane bit. The easy bit for us was delivering, because all that was done.”*** Trainer

In this setting, there was more time for the personal trainers to concentrate on the participants without the private sector emphasis on profit or the public sector imperative of efficiency.

The trainers working on this project felt that there was more time to devote

to working with the service users and to input their expertise in the programme, which in turn was rewarding professionally,

***“I have worked in the public sector before, in leisure centres and stuff and there hasn’t been that same commitment... it’s not delivered the way I would want to deliver it, but you’re not allowed to deliver it the way you want to... whereas this time you were actually able to contribute, you were able to do it the way it should’ve been done from the get go and I think people got a lot more from it, than a lot of the GP run schemes and stuff.”*** Trainer

### **Cost**

Connected to the time dedicated to developing the programmes is, of course, the issue of cost. There was an initial investment of PTI’s time in developing the framework for the physical activity programme and the assessment of each service user but the trainers felt less pressure compared to working in alternative private and public/leisure settings and had the flexibility to deliver the programme they wanted to,

***“I’ve found as well, working this time obviously for a private organisation, I was able to put a lot more into it. A lot more input, I had more of a say... [in the public sector] it’s all about costs... it was all about making a profit. So it was about cutting corners and just kind of getting it in, getting the funding in and getting the project laid out and say, right we’ve done it”*** Trainer



## Facilitators for physical activity

### The skills & experience of the training team

The personal trainer vs the coach  
There was much discussion about the language of 'exercise' and 'physical activity' and a similar discussion was had with the terms 'personal trainer' and 'coach'.

*"Do you not find your role in and outside of this, is actually re-educating people on what a personal trainer is though? You say personal trainer to somebody and their initial thought is almost like an army boot camp instructor and they think that you're going to just push them to the point where they are sick and tell them to get up and keep on going, cause that's what your job is, to make sure they're actually wrecked by the end of their workout, but it's not. I know initially my first week is actually re-educating people on what I'm going to do and what my job is."*

Trainer

PTI took great consideration identifying the trainers who they felt would be beneficial to the programme aware of the range of skills and qualities within the profession, meeting with diverse needs of those wishing to access support from a fitness professional. As Lee explains,

*"there's different types of coaches, different types of trainers, so it's not a one cap fits all approach... there's nothing wrong with that particular personal trainer... who is six foot wide and solid muscle... there's individuals who want that, but in this type of environment and these type of*

*individuals, I think it's very important that you take that away... strip it of everything"* Lee, PTI

### Personal qualities of the trainers

Each of the trainers have a range of relevant qualifications including a specific mental health related training. They had direct experience of working on a one-to-one basis with conditions including PTSD and Tourette's syndrome and knew how to support these service users to access their exercise programme in a safe setting and removing triggers such as loud music or busy and crowded spaces. PTI recruited trainers that had the right skill set,

*"I know what style they would have, their approachability, what their goal is, who they want to help, why they want to help"* Lee, PTI

While on paper, they were suitably qualified, participants identified a range of other qualities that helped with the delivery of the programme.

They had a good understanding of some of the potential concerns people might have had and as already discussed shared some of the personal experiences that the participants had.

*"I think it was also at the very start, we were very open, saying that if they had any concerns or were worried about something, our response to them, look you're not going to get hurt. We said, you will be sore the next day or so, but that's natural, that's just your muscles starting to re-activate. So, we were sort of letting them know, look if you do get sore the following day, don't panic,*



***you haven't hurt anything, it's just your muscles reacting to the activity you've been doing.*** Trainer

While our population was targeted because of their use of mental health services, the trainers were open and cognisant of the wider prevalence of mental health issues with their client base.

With extensive training to deliver support to people in recovery with cardio-pulmonary disease, diabetes, and cancer for example, they recognised that many people deal with depression and anxiety on a day to day basis and are often co-morbid with other physical conditions,

***"there's very few clients that have come to me that haven't had mental health... just because they haven't had a specific diagnosis of a mental health condition, you know, everybody will have a mental health condition of some sort"*** Trainer

We also discussed the more negative associations within the health and fitness industry and how it is intrinsically linked to perceptions around body image and anxieties related to how people think and feel about their physical selves,

***"the health and fitness industry is actually pretty much based on, most people would go and want training sessions because they have some sort of maybe anxiety or something like that"*** Trainer

The participants in our study responded warmly to the trainers when asked to describe how and what they did, illustrating characteristics of patience,

empathy and being able to encourage participation,

***"They're not really rushing you or pushing you hard or anything... letting you take it at your own pace, so they are, they're not turning around going like putting you down in front of everybody."***

***"They're very, very nice, and they're just taking it at your own pace so they do and they would wait on you and stuff like that, they just seemed to fit in right away, didn't they?"***

Nicola, carer, city setting

***"They are nice people. They are genuinely nice people so they are."***

Karen, city carer

Patience and empathy were recognised as key skills by the trainers too,

***"Patience, empathy, that was one of the big things we kind of picked up on... and we made it clear from week one at [city carers group], was, look if you turn up one week and you don't feel great just say, that's ok. We all have bad weeks..."*** Trainer

***"I think actually caring about the individual, I know that sounds silly but in the game like personal training, a lot of them don't care"*** Trainer

The trainers as well as the participants felt a sense of personal investment and reward during the project. One of the trainers described the impact of the programme on two young men in the group,

***"The two lads that were on that and to see the difference... that was***



*phenomenal. For a guy who was not getting up until half one, two o'clock every day, because he just didn't see the point in doing it, to getting up every morning, getting himself into a routine, starting to actually look at what he was doing, in terms of what he was eating and what have you. The progression over the 12 weeks was phenomenal. They wanted to learn more..."* Trainer

## Creating the right environment

The coaches felt that this aspect was crucial, having a regular and appropriate meeting space where mobile equipment could be used safely and large enough to offer circuits-based activities.

Some centres changed the room each session and participants felt undervalued because the programme was not seen as a core activity.

*"If you were in a Pilates class every week, it's in the same room, everybody knows where they're going, they have their space laid out... and we were all over the place... it actually quite annoyed a few of the group and they felt like they were brushed to the side. They said, you know we're coming in here and it's as if they don't want us here"* Trainer

Some of the communal space areas within the supported living environments are very restricted and inappropriate for physical activity classes and while the trainers were creative using chair-based and outdoor activities, the weather in Northern Ireland may not always allow for outside sessions.

The trainers also had a range of inexpensive portable equipment and Bluetooth speakers to help create programme variety but stressed that the physical environment was the most important consideration to reduce stress and anxiety and deliver a valuable session,

*"it's not the equipment, it's more the room and the environment... we know what sort of pressures are going to heighten their anxiety, so we took that away from them... we were taking the triggers out from it"* Trainer

A non-gym setting was considered important, particularly at early stages of engagement.

*"I couldn't possibly go to a gym, I would be sick... I just couldn't exert myself like that, I'd have no energy, nothing..."* Nicola, city carer

There was an emphasis in the focus group with the personal trainers that a broader understanding of physical activity was needed.

*"Educating, if that's the right word, but making them aware that the word exercise doesn't necessarily have to be associated in a gym environment, it could be something else."* Trainer

## Programme content

Participants described the physical activity programme provided as varied and included indoor and outdoor activities,



***“a whole variety of stuff... I think you had the right mix of indoors and outdoors, it was flexible, it was ‘what do you want to do today lads?’”***  
Rory, rural supported living

The range of chair-based exercises was a surprise to everyone who participated including members of the research team,

***“the chair-based exercises, they were much more... I was sweating doing it! My heart was going, I couldn’t believe...”*** Karen, city carer

***“We were tired after it like!”***  
Rosie, city carer

And they were accessible to everyone,

***“I was able to keep up more with chair exercise than what I was with walking so I was”*** Maggie, city carer

Programmes also included elements of stretching and resistance-based work in line with the Chief Medical Officers’ 2011 guidelines. As already mentioned, some participants went on to buy their own bands, and obviously found them beneficial,

***“And the bands, the resistance bands, they were really good”***  
Sean, rural supported living

However, walking activities were popular and many participants talked of the simple benefits of walking such as strengthening their core, something that everyone could do (even those reliant on rollator walking aids) and also incorporated the advantages of being outdoors. One of the trainers explains,

***“We took the guys out for a walk and whilst it seems very simple, that you’re just out walking, but to see them actually the pace at which they were walking, their body language and their interaction and to see them progressing and moving.”*** Trainer

The programmes had to be flexible enough to meet the different needs of participants, there were varying levels of experience and ability but there was a good sense of people progressing up a level, however small, each week and this brought a sense of reward and achievement and this was reported across the interview sites,

***“We done chair exercises you know and then standing up exercises and then in the better weather, we went for walks, pushed ourselves a bit harder each week... he got us to walk up the hill... so we got a bit of... more benefit out of walking up a hill and he got us to kind of walk a bit further each week and if there was time we done some resistance band exercises I think it got a bit easier each week, the more we did, I was feeling a lot fitter in the last few weeks of it”***  
Sean, rural supported living

A small number of participants were already regular gym attenders and had good levels of fitness, but they still enjoyed and participated in the programme.



## Effects beyond the programme

A practical aspect of the programme that was touched on in the focus groups included the Well Check, administered by Northern Ireland Chest, Heart & Stroke, that participants received before and after their intervention.

This assessment flagged some underlying health issues for some participants, and they were grateful that this had given them the opportunity to know more about their health,

*“I was very, very grateful for the pre-assessment because unknown to me I had high blood pressure and had no idea. So as a result of that I have had to be monitored at the doctor for about 3 months”* Katherine, city carer

*“Same as me, I had high cholesterol and all so I did and I have to go back here now in another 2 months for a check-up with the doctor as well part of me when I got the wee test done was really, really high so it was and then he says I’m low in magnesium and that”* Rosie, city carer

The Well Check also presented an opportunity for those with underlying health conditions to speak to their GP and have a more positive exchange about participating in the programme,

*“the girl who took your health thing, she said I can’t take you because I have had 4 strokes and she says unless you, unless your doctor gives a wee letter, it doesn’t have to be a big letter, it can just be her permission and when I said to her, I said this to <name removed>, about what I was*

*going to do and she went, “Mrs [ ], that’s the best news I have heard today... She says it’s the best thing you can do is walk”* Maggie, city care

The Well Checks seemed particularly important for those who were in a caring role, perhaps where the health of those they care for often take priority at the expense of their health.

Being told that they would be offered a second Well Check at the end of the scheme, they were excited at the prospect as this exchange between city carers Maggie, Nicola, Rosie and Katherine shows:

*“Oh, they’re going to run the test again!”*

*That’s good, that’s good*

*I’m looking forward to that*

*It’ll be good to see how our body’s changed*

*And the difference in it*

*It’ll be good so it will, although in 12 weeks, we can’t expect a lot in 12 weeks, but it will be good to see something”*

## Maintaining activity post-programme

As with many research projects, the intervention was time-bound and was concluded after 12 weeks. Although we did not collect any data on maintenance it was something that people were thinking about as the programme



progressed. The carers group talked about keeping up momentum and meeting at the same time and place each week to go for their own walk,

***“Maybe we could meet and go for a wee walk or something ourselves? We could meet at the park or something even? That would be good, walk around the park.”***

Katherine, city carer

Others had joined the gym, bought equipment or were thinking about other kinds of activities. One scheme expressed interest in yoga and QUB were able to support a short 6-week taster session within the supported living setting once the physical activity programme had concluded.

Ending the programme after 12 weeks was disappointing for all, including the trainers,

***“So now I feel that we’re able to now start to incorporate more complex things, but this is where the twelve weeks is going to run out... I feel that we’ve finally got to that point, where we can start to incorporate mainstream training but it’s over. So they’re now getting to that point, where they may be able to the point where they could’ve carried on, on their own, but the winter’s coming in, they’re not going to get out walking much, they could have went on their own to a small gym, if the programme had’ve been extended that bit more, where I think we’re kind of leaving them... 12 weeks, they’re not quite ready for gym, the winters coming in so... it’s not great”*** Trainer

## Future plans

The trainers gave the team some practical advice about how to recruit in the future and recommended providing more information about what the activities would actually involve,

***“let them see what’s sort of coming or the type of exercises or the type of environment they can come and see, that if we were going to take it outside of where they’re used to, they could come and have a look at it, see what it’s like or even just have the initial debrief of what was happening in that environment, so they wouldn’t think that its... right ok, how do you feel about actually doing it here?”***

Trainer

While some data had already been collected on each individual, trainers also recommended meeting people individually before beginning the programme, as one trainer described would be mutually beneficial,

***“I suppose for me I’m always trying to find out what makes the individual tick? What is it that’s... you know, what’s their interests and what’s their motivators and things like that, which I guess you get through time anyway, but just to get a wee bit more information about them before we actually go in... like a meet or greet, because I think that would work both ways, not only for us but also for them”*** Trainer





## Gaps in current provision

The trainers involved in our research have been attracted to work in this area of physical rehabilitation, dealing with people with experience of cancer, cardiac disease or mental ill health because of the personal and professional rewards but there are particular needs of this population that may not be met in current commercial gym or fitness settings.

The social aspect of physical activity has been clearly highlighted but also the need for easier-paced group exercise classes that would have wider appeal to those re-accessing physical activity programmes and settings that are not intimidating to those who feel unable to access a gym.

Having a collective space where equipment could be accessed was considered as having potential,

somewhere that encouraged the social element of meeting as an existing group of people or providing isolated individuals with an opportunity to engage in both social interaction and physical activity was also discussed by the trainers that could offer 'circuits' type activities and social time that is evident in other rehabilitation settings,

***“Very much in the cancer thing, it’s more social and the exercise comes secondary. So yes, they have a wee cup of tea, then they do their wee circuit and then they have a wee chat and then they’ll do another”*** Trainer

Whether social care providers also have a responsibility to provide physical activity as part of their care package or support for service users was also raised with one group.

## 8. Discussion



We have developed an acceptable and feasible co-produced physical activity intervention for people with serious mental health problems and identified barriers and facilitators to implement such a programme in the community.

Future programmes would benefit from further consideration around how to increase quantitative data post-intervention as a quantitative analysis of the data could provide us with a greater insight into the impact of the programme. More research is needed to look at (cost)-effectiveness and scalability when implemented in routine care. Below we specify our main findings with regards to the effects of the intervention, facilitators, barriers and next steps.

### 8a. The effects of physical activity

People with experience of mental health problems care about their physical health and recognise the range of benefits – mentally, physically and socially – that can be gained from being more active. We developed a short-term, feasible programme and found preliminary findings supporting their effects.

It was encouraging that, even at relatively low levels of activity and intensity, immediate benefits were reported. These included improvements in mood, cognitive functioning and decision-making, often leading to positive behaviour change. Physically,

participants described feeling less tired and more energised, sleeping better and even reported a reduction in the negative side effects of their medication.

The programme furthermore helped to reduce social isolation or increase motivation and enjoyment levels by creating a sense of belonging to the community within the supervised physical activity programme.

The key elements to this programme included the quality and skills of the trainers. In addition, the simplicity and accessibility of the exercise programme; based around chair-based exercises, walking and some resistance level training which was progressive across the length of the programme added to its appeal.

### 8b. Facilitators

Our findings reflect what has already been outlined in both the quantitative and qualitative literature review.

- Having a facilitator who is skilled, supportive and non-judgemental – we were lucky to have a team of trainers with specific skills and qualities that benefitted the entire project. They understood the client base well and were willing to be creative and flexible to engage participants.
- Creating the right environment – having a space that was not an intimidating ‘gym’ setting but also practical to encourage participation. Where this place fits into people’s lives



and everyday routines is important and must be somewhere that feels safe and part of their community. Extending this space to the outdoors to access the benefits of being outside is also an easy thing to achieve.

- Choosing an activity where participants can develop skills over time – our participants saw progression each week and felt they were developing some sense of mastery. This sense of achievement is motivating and may also encourage compliance.
- Promoting the importance of the social aspect of the activity; although the majority of participants responded extremely positively to the group setting of the programme, there were also social benefits on an individual basis for some members. Being able to establish new connections is important and can help build self-esteem and confidence but also challenge existing routines and habits.
- Encouragingly, we found that even relatively low levels of activity conveyed positive benefits which were clearly understood and articulated by those involved.
- This is still an area of growing research and the traditional focus on 'exercise' for health may be better understood and described as 'physical activity'. Exploring the relationship between physical activity and other social and quality of life improvements which extend well beyond physical health could be an area for future research.

## 8c. Barriers

The participants in our study shared many similar experiences of barriers to being active. These have been well outlined in the literature and relate to psychological inhibitors such as low self-esteem and perceived lack of ability but also connect to practical issues such as the impact of medication or symptoms, access to facilities or equipment, lack of time and to a lesser extent, cost.

What we did find was that many of these issues could be easily addressed, as demonstrated by the simplicity of the programme, which was delivered at relatively low cost, in an accessible setting and supported appropriately with well qualified staff by PTI. While the time and money invested in developing the skills in the personal trainers is substantial, it was not a direct cost to this project.

One obstacle that we had difficulty tackling in this project was the issue of GP approval. Closer collaboration with health and social care providers may help to deal with some of the barriers relating to this aspect of the project.

This could include the development of a register of mental health trained professionals and awareness raising of the benefits of physical activity for mental health throughout the entire health and social care sector, helping to share the responsibility of mental health service users' physical health too as a support in treatment and recovery.



## 8d. Reflections on the co-production process

The more experienced members of the research team from MHF, Praxis and QUB valued the knowledge, skills and advice of the co-researchers recruited for this project. They brought a deeper level of understanding to the practical issues of working with mental health service users and great insight into the types of questions and research we wanted to conduct. They used their own experiences to connect and engage with participants and proved skilled in motivating others and collecting valuable data during the project. Opportunities to share their experience and knowledge were presented during the course of the project, representing the team at a number of external events; co-researcher members welcomed this opportunity to talk about the co-production process, inform and raise awareness about mental health and help contribute to the writing of additional grant applications.

Our co-researchers were asked to reflect on their experiences and feedback was very positive, about the project in general. One researcher explains,

*“The co-production process was successfully done and I learnt a lot from the training which I put into use in questioning and getting feedback from the service users. Their feedback was proficient and they had different answers to different questions which helped in the data analysis and I hope it will enhance mental health capabilities. It was a process I found exciting and exhilarating.”*

The project presented opportunities to learn new skills but of similar importance, it was crucial that the co-researchers felt as equals on the team,

*“I think I would speak for everyone when I say that we benefited from the experience too both in what we learned about co production and simply from feeling of value.”*

Co-researchers were also asked specifically about their experiences of using PTE as an approach to data analysis. They reported some surprise about just how much data was generated by the process but were encouraged about the synergy across the two different groups of researchers and the similarity of the themes identified. One researcher found it initially daunting,

*“For me, the analysis was the steepest learning curve for the whole thing... but at the same time, it was enjoyable.”*

The method was capable of generating rich data,

*“I hadn’t expected so many themes, I had expected positive and negatives but there were nuances within that”*

The process of data analysis also gave the co-researchers the opportunity to examine some of positive feedback about the physical activity programme,

*“One of the things I noticed was the person with the “mental health problem” didn’t see themselves as being part of a subculture, they were now being more included in society as a whole and in their communities.”*



Being involved in the data analysis in an accessible and meaningful way created valuable opportunities to reflect on the programme and share feelings of success and achievement that it had been worthwhile for many of the participants.

### 8e. Next steps

We think the case for physical activity to empower people with severe and enduring mental health problems has been well made. Even small levels of activity can be beneficial and improve their quality of life. Well Checks, such as those provided by NI Chest, Heart and Stroke were welcomed by participants and highlighted some of the health

concerns often associated with mental health problems.

Strategies to promote physical activity as a social, mental and physical intervention should be the target of a wide range of health and social care professionals.

The co-production process was a worthwhile and meaningful way to involve people with lived experience and enhanced the research methods, helped to build capacity in a group of co-researchers that we would hope to work with again. Ways to continue to develop this method and support this group of individuals with special expertise is something we wish to explore.



## 9. Conclusion



***The participants in our study were interested and invested in their physical health. They wanted to improve their levels of physical activity because they clearly recognised the benefits for both their mental and physical wellbeing.***



Participants reported improvements in their symptoms, increased self-esteem, positive lifestyle behaviour changes, physical gains and social benefits. There were also some people that we couldn't help, whether this was an unwillingness to engage or due to the practical barriers.

These barriers were identified by both participants and the trainers who supported them. These were not deemed unsurmountable and a range of measures were suggested to try and mitigate these barriers including:

- creating the right physical environment, in a non-intimidating setting;
- building a recognised network of personal trainers with a specialist skill-set and qualification profile who can connect with this population group;
- establishing realistic and achievable goals to promote lifestyle change;
- promoting the social benefits of being active, helping to reduce social isolation and encourage participation through a sense of belonging and a shared community; and
- enabling GPs, Community Mental Health Teams, psychiatrists and other health and social care professionals to support access to physical activity interventions that are tailored for this population

## 10. Key Recommendations



**From our research study, we have identified a series of key recommendations:**

- 1** Physical activity is a low-cost intervention and can be accessible and appealing to those who have experience of serious and enduring mental health problems.
- 2** While there were barriers to participation created by lack of GP permission, thought could be given to the establishment of a register of mental health trained health and fitness professionals to support social prescribing of exercise in appropriate and supportive settings.
- 3** An alternative way of approaching this potential barrier would be to operate future projects on a 'GP exclusion' basis, which have been successfully used in other physical activity programmes. A letter is sent to the GP informing them of a participant's inclusion in a programme; GPs are advised to contact the provider should the planned activity be contraindicated.
- 4** Options for people who may be more difficult to reach should also be explored, for example, people who are reluctant to leave their own homes. This project has shown how physical activity can be something which could be delivered effectively in a household setting.
- 5** The social benefits of the activity were considered to be as important as any physical and mental health gains and this aspect should be promoted when developing and planning an intervention. This has importance for who, where, when and how an intervention can be delivered.
- 6** The group of carers in this study also greatly benefitted from the programme and are often described as a forgotten workforce within service delivery. The importance of self-care and creating opportunities for social connectedness through physical activity could have many advantages for this isolated and undervalued group of carers.
- 7** Much will need to be done to create the kind of environment which places equal priority on the physical health needs of those using mental health services. For too long this has been a neglected area of health and social care provision where unhealthy lifestyle choices have been seen as symptomatic of mental health problems and not a focus of treatment and recovery. Physical health should be recognised as a core responsibility of both health and social care and community-based provision of health and leisure facilities, such as local councils and schools.

# 11. Appendices

## Appendix 1: NICHS Well Check



Northern Ireland Chest Heart & Stroke



### Well Check Questionnaire

Please **read through carefully** making sure you understand and answer all questions fully.

Please bring the completed form to your scheduled appointment.

#### Personal Information:

Title: \_\_\_\_\_ First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_  
Month & Year of Birth: \_\_\_\_\_ Age: \_\_\_\_\_ Postcode: \_\_\_\_\_ Gender: Male  Female  Non-Binary   
Email Address: \_\_\_\_\_ Contact Number: \_\_\_\_\_

#### Medical History (please tick ALL boxes that apply):

- |  |   |
|--|---|
| Family History of Coronary Heart Disease <input type="checkbox"/>  | Are You Asthmatic? <input type="checkbox"/>               |
| Family History of High Cholesterol <input type="checkbox"/>        | Do you suffer from Diabetes? <input type="checkbox"/>     |
| Family History of High Blood Pressure <input type="checkbox"/>     | Do you have any blood disorders? <input type="checkbox"/> |
| Taking Medication for High BP/Cholesterol <input type="checkbox"/> | *Are you pregnant? <input type="checkbox"/>               |
|  | *Do you have a pacemaker? <input type="checkbox"/>        |

*\*if applicable body composition cannot be undertaken*

#### Lifestyle Questions:

- 1) On a scale of 1-10 how stressed are you? \_\_\_\_\_ 1 –not at all, 10-extremely
- 2) On a scale of 1-10 how worried are you about your eating habits? \_\_\_\_\_ 1- never, 10- often
- 3) On average how active are you at work? \_\_\_\_\_ outside of work? \_\_\_\_\_ 1- Inactive 5 –extremely active
- 4) Do you drink? \_\_\_\_\_ If yes, on average how many days of the week do you drink? \_\_\_\_\_ On average, how many units would you drink per session? \_\_\_\_\_
- 5) Do you currently smoke? \_\_\_\_\_ If yes, on average how many would you smoke per day? \_\_\_\_\_ Roughly when did you begin smoking? (month & year) \_\_\_\_\_
- 6) Have you ever smoked? \_\_\_\_\_ If yes, on average how many would you have smoked per day? \_\_\_\_\_ Roughly when did you begin smoking? (month & year) \_\_\_\_\_ and when did you quit (month & year)? \_\_\_\_\_
- 7) Do you vape? \_\_\_\_\_ If yes, approximately how many ml of e-liquid do you consume per day? \_\_\_\_\_ How many mg of nicotine do you consume per day? \_\_\_\_\_ When did you start vaping? \_\_\_\_\_ When did you stop vaping? \_\_\_\_\_
- 8) How concerned are you about your sleeping habits? 1 –not at all, 10-extremely
- 9) On average how many complete hours of undisturbed sleep do you get most nights? \_\_\_\_\_

#### Consent

We have systems and procedures in place to maintain security and confidentiality and comply with the General Data Protection Regulation and Data Protection Act 2018. We will store any information that you provide both on paper and electronically, in secure conditions. We may occasionally publish research or statistics about health at work generally. When we do this it will be compiled from data acquired from many different organisations and will not refer to named individuals

We process your personal data in order to provide our health and social care services to you and we cannot provide you with these services without your personal data. For full details of how we process your personal data, please see our privacy policy (<https://nichs.org.uk/wp-content/uploads/2018/05/This-Privacy-Policy-is-under-development.pdf>) and if you have any questions please contact [healthpromotion@nichs.org.uk](mailto:healthpromotion@nichs.org.uk).

I agree to provide a finger stick blood sample for the purposes of monitoring my cholesterol at my own risk. A drop of blood is required for the test and is taken from a finger stick sample. **Fasting is not required**, however not eating or drinking (including caffeinated products) for 1-2 hours before the test helps get a more accurate reading. **Bare feet will be required for body composition readings**. If you would not like to be contacted in regards to follow up (where readings are above a normal threshold) please tick this box ( ).

This consultation can only provide general information and not personalised medical advice. We will not accept any liability arising from this consultation or any information provided to you as a result of it.

Signed: \_\_\_\_\_ Date: \_\_\_\_\_





Lifestyle Questions;

**On a scale of 1-5 how active you at work?**

**1 = Physically Inactive** – You have an inactive job ie sitting at a desk and you rarely move from your desk/ work position during an average day. Examples of this job are : Officer worker, sales assistant, receptionist, Doctor.

**2 = Slightly active**- You have an inactive job but take regular breaks walking ie taking the stairs instead of the lift and taking a walk on your lunch. Examples of this job are : Officer worker, sales assistant , receptionist, Doctor.

**3 = Moderately active** – You job is slightly active which involves being on your feet/ walking / lifting for over 25 % of the day. Examples of this job are : Delivery Driver, Shop Assistant.

**4 = Very active**- You have a very active job which involves lifting and/or being on your feet for over 50 % of the day. Examples of this job are : Hair dresser, Site Manager , Hospital Nurse.

**5 = Extremely Active** - You have a very active job which involves lifting and/ or being on your feet for over 75 % of the day. Examples of this job are : Equipment operator, labourer, agricultural worker, some construction work.

**On a scale of 1-5 how active you at in your leisure time ?**

**1 = Physically Inactive** - You rarely walk anywhere and don't do any specific exercise or activity during an average day.

**2 = Slightly active**- You walk regularly but do not take part in sports, exercise or activity

**3 = Moderately active** - You walk regularly and occasionally take part in 1-2, 30 minute moderate -intensity physical activity sessions per week ( Brisk walking, Exercise , Sports)

**4 = Very active**- You walk regularly and occasionally take part in 3-4, 30 minute moderate –intensity physical activity session per week ( Brisk walking, Exercise , Sports)

**5 = Extremely Active** - You take part in 5 or more 30 minute moderate -intensity physical activity sessions per week ( Brisk walking, Exercise , Sports)

\*Moderate - Intensity Physical Activity means you are working hard enough to make you breathe more heavily than normal and become slightly warmer. Reference Department of Health (At least 5 times a week).

**Alcohol Unit Examples:**

Standard (175ml) glass of wine - 2 units

Large (250ml) glass of wine - 3 units

Pint (568 ml) of standard lager - 2.3 units

Pint (568 ml) of premium lager - 2.8 units

Pint (568 ml) of strong cider - 4.7 units

**For Office Use Only:**

Weight: \_\_\_\_\_

Height: \_\_\_\_\_

Blood Pressure: \_\_\_\_\_

HDL: \_\_\_\_\_

Total Cholesterol: \_\_\_\_\_

Total/HDL Ratio: \_\_\_\_\_

Body Fat %: \_\_\_\_\_

Water %: \_\_\_\_\_

Metabolic Rate: \_\_\_\_\_



## Appendix 2: PAR-Q+

# 2019 PAR-Q+

### The Physical Activity Readiness Questionnaire for Everyone

The health benefits of regular physical activity are clear; more people should engage in physical activity every day of the week. Participating in physical activity is very safe for MOST people. This questionnaire will tell you whether it is necessary for you to seek further advice from your doctor OR a qualified exercise professional before becoming more physically active.

#### GENERAL HEALTH QUESTIONS

Please read the 7 questions below carefully and answer each one honestly: check YES or NO.	YES	NO
1) Has your doctor ever said that you have a heart condition <input type="checkbox"/> OR high blood pressure <input type="checkbox"/> ?	<input type="checkbox"/>	<input type="checkbox"/>
2) Do you feel pain in your chest at rest, during your daily activities of living, OR when you do physical activity?	<input type="checkbox"/>	<input type="checkbox"/>
3) Do you lose balance because of dizziness OR have you lost consciousness in the last 12 months? Please answer NO if your dizziness was associated with over-breathing (including during vigorous exercise).	<input type="checkbox"/>	<input type="checkbox"/>
4) Have you ever been diagnosed with another chronic medical condition (other than heart disease or high blood pressure)? PLEASE LIST CONDITION(S) HERE: _____	<input type="checkbox"/>	<input type="checkbox"/>
5) Are you currently taking prescribed medications for a chronic medical condition? PLEASE LIST CONDITION(S) AND MEDICATIONS HERE: _____	<input type="checkbox"/>	<input type="checkbox"/>
6) Do you currently have (or have had within the past 12 months) a bone, joint, or soft tissue (muscle, ligament, or tendon) problem that could be made worse by becoming more physically active? Please answer NO if you had a problem in the past, but it <b>does not limit your current ability</b> to be physically active. PLEASE LIST CONDITION(S) HERE: _____	<input type="checkbox"/>	<input type="checkbox"/>
7) Has your doctor ever said that you should only do medically supervised physical activity?	<input type="checkbox"/>	<input type="checkbox"/>

If you answered NO to all of the questions above, you are cleared for physical activity. Please sign the PARTICIPANT DECLARATION. You do not need to complete Pages 2 and 3.

- Start becoming much more physically active – start slowly and build up gradually.
- Follow International Physical Activity Guidelines for your age ([www.who.int/dietphysicalactivity/en/](http://www.who.int/dietphysicalactivity/en/)).
- You may take part in a health and fitness appraisal.
- If you are over the age of 45 yr and NOT accustomed to regular vigorous to maximal effort exercise, consult a qualified exercise professional before engaging in this intensity of exercise.
- If you have any further questions, contact a qualified exercise professional.

#### PARTICIPANT DECLARATION

If you are less than the legal age required for consent or require the assent of a care provider, your parent, guardian or care provider must also sign this form.

I, the undersigned, have read, understood to my full satisfaction and completed this questionnaire. I acknowledge that this physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if my condition changes. I also acknowledge that the community/fitness center may retain a copy of this form for its records. In these instances, it will maintain the confidentiality of the same, complying with applicable law.

NAME \_\_\_\_\_ DATE \_\_\_\_\_

SIGNATURE \_\_\_\_\_ WITNESS \_\_\_\_\_

SIGNATURE OF PARENT/GUARDIAN/CARE PROVIDER \_\_\_\_\_



If you answered YES to one or more of the questions above, COMPLETE PAGES 2 AND 3.

#### Delay becoming more active if:

- You have a temporary illness such as a cold or fever; it is best to wait until you feel better.
- You are pregnant - talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the ePARmed-X+ at [www.eparmedx.com](http://www.eparmedx.com) before becoming more physically active.
- Your health changes - answer the questions on Pages 2 and 3 of this document and/or talk to your doctor or a qualified exercise professional before continuing with any physical activity program.



# 2019 PAR-Q+

## FOLLOW-UP QUESTIONS ABOUT YOUR MEDICAL CONDITION(S)

- 1. Do you have Arthritis, Osteoporosis, or Back Problems?**  
If the above condition(s) is/are present, answer questions 1a-1c      If **NO**  go to question 2
- 1a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)      YES  NO
- 
- 1b. Do you have joint problems causing pain, a recent fracture or fracture caused by osteoporosis or cancer, displaced vertebra (e.g., spondylolisthesis), and/or spondylolysis/pars defect (a crack in the bony ring on the back of the spinal column)?      YES  NO
- 
- 1c. Have you had steroid injections or taken steroid tablets regularly for more than 3 months?      YES  NO
- 
- 2. Do you currently have Cancer of any kind?**  
If the above condition(s) is/are present, answer questions 2a-2b      If **NO**  go to question 3
- 2a. Does your cancer diagnosis include any of the following types: lung/bronchogenic, multiple myeloma (cancer of plasma cells), head, and/or neck?      YES  NO
- 
- 2b. Are you currently receiving cancer therapy (such as chemotherapy or radiotherapy)?      YES  NO
- 
- 3. Do you have a Heart or Cardiovascular Condition? This includes Coronary Artery Disease, Heart Failure, Diagnosed Abnormality of Heart Rhythm**  
If the above condition(s) is/are present, answer questions 3a-3d      If **NO**  go to question 4
- 3a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)      YES  NO
- 
- 3b. Do you have an irregular heart beat that requires medical management? (e.g., atrial fibrillation, premature ventricular contraction)      YES  NO
- 
- 3c. Do you have chronic heart failure?      YES  NO
- 
- 3d. Do you have diagnosed coronary artery (cardiovascular) disease and have not participated in regular physical activity in the last 2 months?      YES  NO
- 
- 4. Do you have High Blood Pressure?**  
If the above condition(s) is/are present, answer questions 4a-4b      If **NO**  go to question 5
- 4a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)      YES  NO
- 
- 4b. Do you have a resting blood pressure equal to or greater than 160/90 mmHg with or without medication? (Answer **YES** if you do not know your resting blood pressure)      YES  NO
- 
- 5. Do you have any Metabolic Conditions? This includes Type 1 Diabetes, Type 2 Diabetes, Pre-Diabetes**  
If the above condition(s) is/are present, answer questions 5a-5e      If **NO**  go to question 6
- 5a. Do you often have difficulty controlling your blood sugar levels with foods, medications, or other physician-prescribed therapies?      YES  NO
- 
- 5b. Do you often suffer from signs and symptoms of low blood sugar (hypoglycemia) following exercise and/or during activities of daily living? Signs of hypoglycemia may include shakiness, nervousness, unusual irritability, abnormal sweating, dizziness or light-headedness, mental confusion, difficulty speaking, weakness, or sleepiness.      YES  NO
- 
- 5c. Do you have any signs or symptoms of diabetes complications such as heart or vascular disease and/or complications affecting your eyes, kidneys, **OR** the sensation in your toes and feet?      YES  NO
- 
- 5d. Do you have other metabolic conditions (such as current pregnancy-related diabetes, chronic kidney disease, or liver problems)?      YES  NO
- 
- 5e. Are you planning to engage in what for you is unusually high (or vigorous) intensity exercise in the near future?      YES  NO
-



# 2019 PAR-Q+

- 6. Do you have any Mental Health Problems or Learning Difficulties?** This includes Alzheimer's, Dementia, Depression, Anxiety Disorder, Eating Disorder, Psychotic Disorder, Intellectual Disability, Down Syndrome  
If the above condition(s) is/are present, answer questions 6a-6b      If **NO**  go to question 7
- 6a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)      YES  NO
- 6b. Do you have Down Syndrome **AND** back problems affecting nerves or muscles?      YES  NO
- 
- 7. Do you have a Respiratory Disease?** This includes Chronic Obstructive Pulmonary Disease, Asthma, Pulmonary High Blood Pressure  
If the above condition(s) is/are present, answer questions 7a-7d      If **NO**  go to question 8
- 7a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)      YES  NO
- 7b. Has your doctor ever said your blood oxygen level is low at rest or during exercise and/or that you require supplemental oxygen therapy?      YES  NO
- 7c. If asthmatic, do you currently have symptoms of chest tightness, wheezing, laboured breathing, consistent cough (more than 2 days/week), or have you used your rescue medication more than twice in the last week?      YES  NO
- 7d. Has your doctor ever said you have high blood pressure in the blood vessels of your lungs?      YES  NO
- 
- 8. Do you have a Spinal Cord Injury?** This includes Tetraplegia and Paraplegia  
If the above condition(s) is/are present, answer questions 8a-8c      If **NO**  go to question 9
- 8a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)      YES  NO
- 8b. Do you commonly exhibit low resting blood pressure significant enough to cause dizziness, light-headedness, and/or fainting?      YES  NO
- 8c. Has your physician indicated that you exhibit sudden bouts of high blood pressure (known as Autonomic Dysreflexia)?      YES  NO
- 
- 9. Have you had a Stroke?** This includes Transient Ischemic Attack (TIA) or Cerebrovascular Event  
If the above condition(s) is/are present, answer questions 9a-9c      If **NO**  go to question 10
- 9a. Do you have difficulty controlling your condition with medications or other physician-prescribed therapies? (Answer **NO** if you are not currently taking medications or other treatments)      YES  NO
- 9b. Do you have any impairment in walking or mobility?      YES  NO
- 9c. Have you experienced a stroke or impairment in nerves or muscles in the past 6 months?      YES  NO
- 
- 10. Do you have any other medical condition not listed above or do you have two or more medical conditions?**  
If you have other medical conditions, answer questions 10a-10c      If **NO**  read the Page 4 recommendations
- 10a. Have you experienced a blackout, fainted, or lost consciousness as a result of a head injury within the last 12 months **OR** have you had a diagnosed concussion within the last 12 months?      YES  NO
- 10b. Do you have a medical condition that is not listed (such as epilepsy, neurological conditions, kidney problems)?      YES  NO
- 10c. Do you currently live with two or more medical conditions?      YES  NO





PLEASE LIST YOUR MEDICAL CONDITION(S)  
AND ANY RELATED MEDICATIONS HERE: \_\_\_\_\_  
\_\_\_\_\_

**GO to Page 4 for recommendations about your current medical condition(s) and sign the PARTICIPANT DECLARATION.**



# 2019 PAR-Q+

 **If you answered NO to all of the FOLLOW-UP questions (pgs. 2-3) about your medical condition, you are ready to become more physically active - sign the PARTICIPANT DECLARATION below:**



-  It is advised that you consult a qualified exercise professional to help you develop a safe and effective physical activity plan to meet your health needs.
-  You are encouraged to start slowly and build up gradually - 20 to 60 minutes of low to moderate intensity exercise, 3-5 days per week including aerobic and muscle strengthening exercises.
-  As you progress, you should aim to accumulate 150 minutes or more of moderate intensity physical activity per week.
-  If you are over the age of 45 yr and **NOT** accustomed to regular vigorous to maximal effort exercise, consult a qualified exercise professional before engaging in this intensity of exercise.

 **If you answered YES to one or more of the follow-up questions about your medical condition:**



You should seek further information before becoming more physically active or engaging in a fitness appraisal. You should complete the specially designed online screening and exercise recommendations program - the ePARmed-X+ at [www.eparmedx.com](http://www.eparmedx.com) and/or visit a qualified exercise professional to work through the ePARmed-X+ and for further information.

 **Delay becoming more active if:**

-  You have a temporary illness such as a cold or fever; it is best to wait until you feel better.
-  You are pregnant - talk to your health care practitioner, your physician, a qualified exercise professional, and/or complete the ePARmed-X+ at [www.eparmedx.com](http://www.eparmedx.com) before becoming more physically active.
-  Your health changes - talk to your doctor or qualified exercise professional before continuing with any physical activity program.

-  You are encouraged to photocopy the PAR-Q+. You must use the entire questionnaire and NO changes are permitted.
-  The authors, the PAR-Q+ Collaboration, partner organizations, and their agents assume no liability for persons who undertake physical activity and/or make use of the PAR-Q+ or ePARmed-X+. If in doubt after completing the questionnaire, consult your doctor prior to physical activity.

## PARTICIPANT DECLARATION

-  All persons who have completed the PAR-Q+ please read and sign the declaration below.
-  If you are less than the legal age required for consent or require the assent of a care provider, your parent, guardian or care provider must also sign this form.

*I, the undersigned, have read, understood to my full satisfaction and completed this questionnaire. I acknowledge that this physical activity clearance is valid for a maximum of 12 months from the date it is completed and becomes invalid if my condition changes. I also acknowledge that the community/fitness center may retain a copy of this form for records. In these instances, it will maintain the confidentiality of the same, complying with applicable law.*

NAME \_\_\_\_\_ DATE \_\_\_\_\_

SIGNATURE \_\_\_\_\_ WITNESS \_\_\_\_\_

SIGNATURE OF PARENT/GUARDIAN/CARE PROVIDER \_\_\_\_\_

For more information, please contact  
[www.eparmedx.com](http://www.eparmedx.com)  
Email: [eparmedx@gmail.com](mailto:eparmedx@gmail.com)

**Citation for PAR-Q+**  
Warburton DER, Jamnik VK, Bredin SSD, and Gledhill N on behalf of the PAR-Q+ Collaboration. The Physical Activity Readiness Questionnaire for Everyone (PAR-Q+) and Electronic Physical Activity Readiness Medical Examination (ePARmed-X+). *Health & Fitness Journal of Canada* 4(2):3-23, 2011.

**Key References**

1. Jamnik VK, Warburton DER, Makarski J, McKenzie DC, Shephard RJ, Stone J, and Gledhill N. Enhancing the effectiveness of clearance for physical activity participation: background and overall process. *APNM* 36(S1):53-513, 2011.
2. Warburton DER, Gledhill N, Jamnik VK, Bredin SSD, McKenzie DC, Stone J, Charlesworth S, and Shephard RJ. Evidence-based risk assessment and recommendations for physical activity clearance; Consensus Document. *APNM* 36(S1):5266-5298, 2011.
3. Chisholm DM, Collis ML, Kulak LL, Davenport W, and Gruber N. Physical activity readiness. *British Columbia Medical Journal*. 1975;17:375-378.
4. Thomas S, Reading J, and Shephard RJ. Revision of the Physical Activity Readiness Questionnaire (PAR-Q). *Canadian Journal of Sport Science* 1992;17:4 338-345.

The PAR-Q+ was created using the evidence-based AGREE process (1) by the PAR-Q+ Collaboration chaired by Dr. Darren E. R. Warburton with Dr. Norman Gledhill, Dr. Veronica Jamnik, and Dr. Donald C. McKenzie (2). Production of this document has been made possible through financial contributions from the Public Health Agency of Canada and the BC Ministry of Health Services. The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada or the BC Ministry of Health Services.

## Appendix 3: Example exercises for GP clearance

QUB Research Project in conjunction with PTI

Date:

Participant Name:		GP Practice:		
Activity Examples	Intensity	Cleared	Not Cleared	Comments
Walking indoor/outdoor slow pace	< 2 miles per hour			
Walking indoor/outdoor moderate pace	3 (± 0.5 ) miles per hour			
Chair based exercises e.g. seated leg extension	low RPE of 8-10			
Standing exercises e.g. leg raise	low - moderate RPE of 8-14			
Wall supported exercises e.g.modified chest press	low - moderate RPE of 8-14			
Resistance band exercises e.g. upright row	low - moderate RPE of 8-14			
Aerobic based exercises e.g. march on the spot	low - moderate RPE of 8-14			
Medicine ball exercises e.g. tricep extension	3 kg Med ball RPE of 8-12			
Dumbbell exercises e.g bicep curl	1-3 kg dumbbell RPE of 8-12			
3 a-side walking football	low - moderate RPE of 8-14			
Seated football passes	low RPE of 8-12			
Standing gated football passes	low RPE of 8-12			

Signature \_\_\_\_\_

Key: RPE = Rate of Perceived Exertion calculated using 6-20 Borg Scale

All exercises will be undertaken in a slow and controlled manner under the strict supervision of appropriately qualified instructors.

If you have any further questions please do not hesitate to contact me:

Naomi McArdle

Platinum Training Institute

Tel: 00447765858987

Email: [naomi@platinumtraininginstitute.com](mailto:naomi@platinumtraininginstitute.com)





## Appendix 4: Qualitative interview schedule

### Physical activity and you

- What does the term physical activity mean to you?
- Has anybody ever suggested physical activity to you before?

### Previous experiences of physical activity

- Tell me about any past experiences of physical activity. Were you active in school, were you a member of any sports clubs?

### Current level of activity

- Do you take part in any physical activity? If yes, can you tell me a bit more about what you do?
- Can you tell me why you do it?
- Do you think there are any benefits in taking part in physical activity?
- If you are physically active, how does it make you feel at the end of it? Tell us about that.
- What things in your life have helped you be physically active?
- Have you experienced any mental health benefits through physical activity?
- Do you plan to make any other lifestyle changes? e.g. stop smoking, eat more healthily?

### Barriers to physical activity

- In your experience what are the barriers to being physically active? [Are there things that you have thought you would like to do and haven't done them?]

### Physical activity and technology

- Have you ever used technology to support your exercise? E.g. pedometers, Fitbit, or using the Wii, etc?

### Practical issues

- Do you prefer exercising in or outdoors? Where do you generally prefer to be active?
- Do you have any support around you to help you be more physically active? Can you tell me a bit more about your supports? Do you prefer being active individually or a group activity, or both?

### Future

- How do you feel about more physical activity?



## Appendix 5: Stakeholder interviews

Stakeholder Interviews were conducted by Claire McCartan early on in the project (before the start of the co-production and intervention) with partners in the Recovery Colleges, NI Chest, Heart and Stroke and Disability Action (All Active programme) to explore issues around the content and design of the programme. Drawing on their expertise, recommendations were made to enhance the programme design which included incorporating a behaviour change model and advice on how to improve the co-production process by creating clear guidelines around participation. Specific terms of reference for the group and establishing the expectations from each partner in the co-production process was recommended. It also suggested that a minimum number of people with 'lived experience' and professionals should be agreed on and decision-making moved forward on that basis.

The general barriers to physical activity for this population were discussed and the challenge of how activity is characterised in everyday life which may seem unobtainable to a population with severe and enduring mental health problems. Suggestions about 'exercise snacking' and lifestyle change were made and the benefits of starting with small steps to being more active which can be incorporated into everyday life routines. NICHS's 'sweat the small things' campaign is a good example of this illustrating everyday activities such as washing your car or weight

bearing exercises that can contribute to increases in activity levels. Disability Action's 'Everybody Active' team were also very familiar with the range of resources and facilities available at a local level through the local councils and recommended key contacts in this area (local council mental health champions).

Other barriers such as low motivation levels, poor self-esteem and cost were also raised as issues. The stakeholders made a number of recommendations to tackle these, highlighting the key skills of staff who would be supporting service users, ensuring that they were well qualified with not only fitness qualifications but additional skills such as health promotion/coaching/counselling and understanding about inclusion for this potentially isolated social group. Other techniques such as buddy systems, establishing a competitive element and individual versus group-based activities were also discussed.

Some of the practical arrangements for delivering the Well Checks were also discussed with NICHS. This ensured that the right setting was provided for conducting the checks to protect participants' privacy. It also led to an information session with the NICHS Well Check team to help them learn more about mental health problems. This lunchtime session was co-delivered by one of the co-researchers (LB) and Rosemary Hawthorne (background in community psychiatric nursing) from the Northern Recovery College.



## 12. References



- Almandil NB, Liu Y, Murray ML, Besag FM, Aitchison KJ, Wong IC. Weight gain and other metabolic adverse effects associated with atypical antipsychotic treatment of children and adolescents: a systematic review and meta-analysis. *Pediatric Drugs*. 2013 Apr 1;15(2):139-50.
- Ashdown-Franks G, Firth J, Carney R, Carvalho AF, Hallgren M, Koyanagi A, Rosenbaum S, Schuch FB, Smith L, Solmi M, Vancampfort D. Exercise as medicine for mental and substance use disorders: a meta-review of the benefits for neuropsychiatric and cognitive outcomes. *Sports Medicine*. 2019 Sep 20:1-20.
- Austin, M.-P., Mitchell, P., & Goodwin, G. M. (2001). Cognitive deficits in depression: possible implications for functional neuropathology. *The British Journal of Psychiatry*, 178(3), 200-206.
- Bak M, Fransen A, Janssen J, van Os J, Drukker M. Almost all antipsychotics result in weight gain: a meta-analysis. *PloS one*. 2014 Apr 24;9(4):e94112.
- Bartels, S. J., Aschbrenner, K. A., Pratt, S. I., Naslund, J. A., Scherer, E. A., Zubkoff, L., . . . Jue, K. (2018). Implementation of a lifestyle intervention for people with serious mental illness in state-funded mental health centers. *Psychiatric Services*, appi. ps. 201700368.
- Beebe, L., Tian, L., Morris, N., Goodwin, A., Allen, S., & Kuldau, J. (2005). Effects of exercise on mental and physical health parameters of persons with schizophrenia. *Issues in Mental Health Nursing*, 26(6), 661-676. doi:10.1080/O1612840590959551.
- Bernard, P., Romain, A., Esseul, E., Artiguisse, M., Poy, Y., & Ninot, G. (2013). Systematic review of barriers to physical activity and motivation or adults with schizophrenia. *Annals of Physical and Rehabilitation Medicine*, 1), e5. doi:http://dx.doi.org/10.1016/j.rehab.2013.07.154.
- Bernard, P., Romain, A., Vancampfort, D., Baillot, A., Esseul, E., & Ninot, G. (2015). Six minutes walk test for individuals with schizophrenia. *Disability and rehabilitation*, 37(11), 1-7. doi:10.3109/O9638288.2014.948136.
- Best, P., Badham, J., Corepal, R., O'Neill, R., Tully, M., Kee, F., & Hunter, R. (2017). Network methods to support user involvement in qualitative data analyses: an introduction to participatory theme elicitation. *Trials*, 18(559). doi:https://doi.org/10.1186/s13063-017-2289-5.
- Bhatia, T., Mazumdar, S., Wood, J., He, F., Gur, R. E., Gur, R. C., . . . Deshpande, S. N. (2017). A randomised controlled trial of adjunctive yoga and adjunctive physical exercise training for cognitive dysfunction in schizophrenia. *Acta Neuropsychiatrica*, 29(2), 102-114. doi:http://dx.doi.org/10.1017/neu.2016.42.
- Bivanco-Lima, D., de Souza Santos, I., Vannucchi, A. M. C., & de Almeida Ribeiro, M. C. S. (2013). Cardiovascular risk in individuals with depression. *Revista da Associação Médica Brasileira*, 59(3), 298-304.
- Boyle, D., Slay, J., & Stephens, L. (2011). *Public services inside out: Putting co-production into practice*, London. Retrieved from London: <https://www.nesta.org.uk/report/public-services-inside-out/>.
- British Heart Foundation. (2017). *Physical Inactivity and Sedentary Behaviour Report 2017*. Retrieved from <https://www.bhf.org.uk/informationsupport/publications/statistics/physical-inactivity-report-2017>
- Broderick, J., Knowles, A., Chadwick, J., & Vancampfort, D. (2015). Yoga versus standard care for schizophrenia. *The Cochrane Library*.
- Brondino, N., Rocchetti, M., Fusar-Poli, L., Codrons, E., Correale, L., Vandoni, M., . . . Politi, P. (2017). A systematic review of cognitive effects of exercise in depression. *Acta Psychiatrica Scandinavica*, 135(4), 285-295. doi:https://dx.doi.org/10.1111/acps.12690.
- Brown, C., Goetz, J., & Hamera, E. (2011). Weight loss intervention for people with serious



mental illness: a randomized controlled trial of the RENEW program. *Psychiatric Services*, 62(7), 800-802. doi:10.1176/appi.ps.62.7.800.

Brown, S., Kim, M., Mitchell, C., & Inskip, H. (2010). Twenty-five year mortality of a community cohort with schizophrenia. *The British Journal of Psychiatry*, 196(2), 116-121.

Busch, A. M., Ciccolo, J. T., Puspitasari, A. J., Nosrat, S., Whitworth, J. W., & Stults-Kolehmainen, M. A. (2016). Preferences for exercise as a treatment for depression. *Mental Health and Physical Activity*, 10, 68-72.

Carless, D., & Douglas, K. (2008a). The contribution of exercise and sport to mental health promotion in serious mental illness: An interpretive project. *International Journal of Mental Health Promotion*, 10(4), 5-12.

Carless, D., & Douglas, K. (2008b). Narrative, identity and mental health: How men with serious mental illness re-story their lives through sport and exercise. *Psychology of Sport and Exercise*, 9(5), 576-594.

Carneiro, L. S., Fonseca, A. M., Vieira-Coelho, M. A., Mota, M. P., & Vasconcelos-Raposo, J. (2015). Effects of structured exercise and pharmacotherapy vs. Pharmacotherapy for adults with depressive symptoms: A randomized clinical trial. *Journal of Psychiatric Research*, 71, 48-55.

Chief Medical Officers. (2019). UK Chief Medical Officers' Physical Activity Guidelines. Retrieved from: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/832868/uk-chief-medical-officers-physical-activity-guidelines.pdf).

Chief Medical Officers. (2011). Start active, stay active: a report on physical activity for health from the four home countries' Chief Medical Officers. Retrieved from: [https://www.sportengland.org/media/2928/dh\\_128210.pdf](https://www.sportengland.org/media/2928/dh_128210.pdf)

Cole, F. (2010). Physical activity for its mental health benefits: Conceptualising participation within the Model of Human Occupation. *The British Journal of Occupational Therapy*, 73(12), 607-615.

Cooper SJ, Reynolds GP, With expert co-authors (in alphabetical order); Barnes TR, England E, Haddad PM, Heald A, Holt RI, Lingford-Hughes A, Osborn D, McGowan O. BAP guidelines on the management of weight gain, metabolic disturbances and cardiovascular risk associated with psychosis and antipsychotic drug treatment. *Journal of Psychopharmacology*. 2016 Aug;30(8):717-48.

Cooney, G., Dwan, K., & Mead, G. (2014). Exercise for depression. *Jama*, 311(23), 2432-2433.

Cotman, C. W., Berchtold, N. C., & Christie, L.-A. (2007). Exercise builds brain health: key roles of growth factor cascades and inflammation. *Trends in neurosciences*, 30(9), 464-472.

Dasso, N. (2018). How is exercise different from physical activity? A concept analysis. *Nursing Forum*, 54(1), 45-52. doi: 10.1111/nuf.12296

Daumit, G. L., Dickerson, F. B., Wang, N. Y., Dalcin, A., Jerome, G. J., Anderson, C. A., . . . Appel, L. J. (2013). A behavioral weight-loss intervention in persons with serious mental illness. *The New England journal of medicine*, 368(17), 1594-1602. doi:10.1056/NEJMoa1214530.

de Wit, L. M., Fokkema, M., van Straten, A., Lamers, F., Cuijpers, P., & Penninx, B. (2010). Depressive and anxiety disorders and the association with obesity, physical, and social activities. *Depression and Anxiety*, 27(11), 1057-1065. doi:10.1002/da.20738.

Doose, M., Ziegenbein, M., Hoos, O., Reim, D., Stengert, W., Hoffer, N., . . . Sieberer, M. (2015). Self-selected intensity exercise in the treatment of major depression: A pragmatic RCT. *International Journal of Psychiatry in Clinical Practice*, 19(4), 266-276.

Elliott, I. (2016). Poverty and mental health. Retrieved from York: <https://www.mentalhealth.org.uk/sites/default/files/Poverty%20and%20Mental%20Health.pdf>.

Ellis, N., Crone, D., Davey, R., & Grogan, S. (2007). Exercise interventions as an adjunct therapy for psychosis: a critical review. *The*

- British Journal of Clinical Psychology / the British Psychological Society, 46(Pt 1), 95-111.
- Ernst, C., Olson, A., Pinel, J., Lam, R., & Christie, B. (2006). Antidepressant effects of exercise: evidence for an adult-neurogenesis hypothesis? *J Psychiatry Neurosci.*, 31(2), 84-92.
- Falkai, P., Malchow, B., & Schmitt, A. (2017). Aerobic exercise and its effects on cognition in schizophrenia. *Current opinion in psychiatry*, 30(3), 171-175.
- Faulkner, G., & Biddle, S. (1999). Exercise as an adjunct treatment for schizophrenia: A review of the literature. *Journal of Mental Health*, 8(5), 441-457. doi:10.1080/O9638239917157
- Faulkner, G., & Sparkes, A. (1999). Exercise as therapy for schizophrenia: An ethnographic study. *Journal of Sport and Exercise Psychology*, 21, 52-69.
- Firth, J., Carney, R., Jerome, L., Elliott, R., French, P., & Yung, A. (2016). The effects and determinants of exercise participation in first-episode psychosis: A qualitative study. *BMC Psychiatry Vol 16 2016*, ArtID 36, 16.
- Firth, J., Cotter, J., Elliott, R., French, P., & Yung, A. (2015). A systematic review and meta-analysis of exercise interventions in schizophrenia patients. *Psychological Medicine*, 45(7), 1343-1361. doi:10.1017/S0033291714003110.
- Firth, J., Rosenbaum, S., Stubbs, B., Górczynski, P., Yung, A., & Vancampfort, D. (2016). Motivating factors and barriers towards exercise in severe mental illness: a systematic review and meta-analysis. *Psychological Medicine*, 46(14), 1-13. doi:10.1017/S0033291716001732.
- Firth J, Siddiqi N, Koyanagi A, Siskind D, Rosenbaum S, et al.,. The Lancet Psychiatry Commission: a blueprint for protecting physical health in people with mental illness. *The Lancet Psychiatry*. 2019 Aug 1;6(8):675-712.
- Foley, L. S., Prapavessis, H., Osuch, E. A., De Pace, J. A., Murphy, B. A., & Podolinsky, N. J. (2008). An examination of potential mechanisms for exercise as a treatment for depression: A pilot study. *Mental Health and Physical Activity*, 1(2), 69-73.
- Forsyth, A. K., Deane, F. P., & Williams, P. G. (2017). Physical activity and fitness outcomes of a lifestyle intervention for primary care patients with depression and anxiety: A randomised controlled trial. *International Journal of Mental Health and Addiction*, 15(3), 545-554.
- Gabilondo, A., Alonso-Moran, E., Nuño-Solinis, R., Orueta, J. F., & Iruin, A. (2017). Comorbidities with chronic physical conditions and gender profiles of illness in schizophrenia. Results from PREST, a new health dataset. *Journal of Psychosomatic Research*, 93, 102-109.
- Glowacki, K., Duncan, M., Gainforth, H., & Faulkner, G. (2017). Barriers and facilitators to physical activity and exercise among adults with depression: A scoping review. *Mental Health and Physical Activity*, 13, 108-119.
- Goff, D. C., Sullivan, L. M., McEvoy, J. P., Meyer, J. M., Nasrallah, H. A., Daumit, G. L., . . . Davis, S. (2005). A comparison of ten-year cardiac risk estimates in schizophrenia patients from the CATIE study and matched controls. *Schizophrenia Research*, 80(1), 45-53.
- Gomez Pinilla, F., Zhuang, Y., Feng, J., Ying, Z., & Fan, G. (2011). Exercise impacts brain derived neurotrophic factor plasticity by engaging mechanisms of epigenetic regulation. *European Journal of Neuroscience*, 33(3), 383-390.
- Górczynski, P., & Faulkner, G. (2010). Exercise therapy for schizophrenia. *Cochrane Database of Systematic Reviews*, (5).
- Gordon, B. R., McDowell, C. P., Lyons, M., & Herring, M. P. (2017). The Effects of Resistance Exercise Training on Anxiety: A Meta-Analysis and Meta-Regression Analysis of Randomized Controlled Trials. *Sports medicine (Auckland, N.Z.)*, 47(12), 2521-2532. doi:10.1007/s40279-017-0769-0.
- Gourgouvelis, J., Yelder, P., & Murphy, B. (2017). Exercise promotes neuroplasticity in both healthy and depressed brains: An fMRI pilot study. *Neural Plasticity Vol 2017 2017*, ArtID 8305287, 2017.
- Green, C. A., Janoff, S. L., Yarborough, B. J. H., & Yarborough, M. T. (2014). A 12-week weight reduction intervention for overweight individuals

- taking antipsychotic medications. *Community Mental Health Journal*, 50(8), 974-980.
- Greer, T., Grannemann, B., Chansard, M., Karim, A., & Trivedi, M. (2015). Dose-dependent changes in cognitive function with exercise augmentation for major depression: Results from the TREAD study. *European Neuropsychopharmacology*, 25(2), 248-256.
- Greer, T., & Trivedi, M. (2009). Exercise in the treatment of depression. *Current Psychiatry Reports*, 11(6), 466.
- Greer, T., Trombello, J., Rethorst, C., Carmody, T., Jha, M., Liao, A., . . . Trivedi, M. (2016). Improvements in psychosocial functioning and health-related quality of life following exercise augmentation in patients with treatment response but nonremitted major depressive disorder: Results from the tread study. *Depression and Anxiety*, 33(9), 870-881.
- Hallgren, M., Helgadottir, B., Herring, M. P., Zeebari, Z., Lindefors, N., Kaldo, V., . . . Forsell, Y. (2016). Exercise and internet-based cognitive-behavioural therapy for depression: Multicentre randomised controlled trial with 12-month follow-up. *The British Journal of Psychiatry*, 209(5), 414-420.
- Herring, M. P., Jacob, M. L., Suveg, C., & O'Connor, P. J. (2011). Effects of short-term exercise training on signs and symptoms of generalized anxiety disorder. *Mental Health and Physical Activity*, 4(2), 71-77.
- Herring, M. P., Johnson, K. E., & O'Connor, P. J. (2016). Exercise training and health-related quality of life in generalized anxiety disorder. *Psychology of Sport and Exercise*, 27, 138-141.
- Herring, M. P., Kline, C. E., & O'Connor, P. J. (2015). Effects of exercise on sleep among young women with generalized anxiety disorder. *Mental Health and Physical Activity*, 9, 59-66.
- Ho, R. T. H., Fong, T. C. T., Wan, A. H. Y., Au-Yeung, F. S. W., Wong, C. P. K., Ng, W. Y. H., . . . Chen, E. Y. H. (2016). A randomized controlled trial on the psychophysiological effects of physical exercise and Tai-chi in patients with chronic schizophrenia. *Schizophrenia Research*, 171(1-3), 42-49. doi:<http://dx.doi.org/10.1016/j.schres.2016.01.038>.
- Hodgson, M. H., McCulloch, H. P., & Fox, K. R. (2011). The experiences of people with severe and enduring mental illness engaged in a physical activity programme integrated into the mental health service. *Mental Health and Physical Activity*, 4(1), 23-29.
- Jazaieri, H., Goldin, P. R., Werner, K., Ziv, M., & Gross, J. J. (2012). A randomized trial of MBSR versus aerobic exercise for social anxiety disorder. *Journal of Clinical Psychology*, 68(7), 715-731.
- Jazaieri, H., Lee, I. A., Goldin, P. R., & Gross, J. J. (2016). Pre-treatment social anxiety severity moderates the impact of mindfulness-based stress reduction and aerobic exercise. *Psychology and Psychotherapy: Theory, Research and Practice*, 89(2), 229-234.
- Josefsson, T., Lindwall, M., & Archer, T. (2014). Physical exercise intervention in depressive disorders: Meta-analysis and systematic review. *Scandinavian Journal of Medicine & Science in Sports*, 24(2), 259-272.
- Karasouli, E., & Adams, A. (2014). Assessing the Evidence for e-Resources for Mental Health Self-Management: A Systematic Literature Review. *JMIR mental health*, 1(1), e3. doi:10.2196/mental.3708.
- Khalil, E., Callaghan, P., Carter, T., & Morres, I. (2012). Pragmatic randomised controlled trial of an exercise programme to improve wellbeing outcomes in women with depression: Findings from the qualitative component. *Psychology*, 3(11), 979-986.
- Kolotkin, R. L., Corey Lisle, P. K., Crosby, R. D., Swanson, J. M., Tuomari, A. V., L'Italien, G. J., & Mitchell, J. E. (2008). Impact of obesity on health related quality of life in schizophrenia and bipolar disorder. *Obesity*, 16(4), 749-754.
- Kvam, S., Kleppe, C. L., Nordhus, I. H., & Hovland, A. (2016). Exercise as a treatment for depression: a meta-analysis. *Journal of Affective Disorders*, 202, 67-86.
- Kyu, H. H., Bachman, V. F., Alexander, L. T., Mumford, J. E., Afshin, A., Estep, K., . . . Forouzanfar, M. H. (2016). Physical activity and risk of breast cancer, colon cancer, diabetes, ischemic heart disease, and ischemic stroke



- events: systematic review and dose-response meta-analysis for the Global Burden of Disease Study 2013. *Bmj*, 354, i3857. doi:10.1136/bmj.i3857.
- LeBouthillier, D. M., & Asmundson, G. J. (2017). The efficacy of aerobic exercise and resistance training as transdiagnostic interventions for anxiety-related disorders and constructs: A randomized controlled trial. *Journal of Anxiety Disorders*, 52, 43-52.
- Lederman, O., Suetani, S., Stanton, R., Chapman, J., Korman, N., Rosenbaum, S., . . . Siskind, D. (2017). Embedding exercise interventions as routine mental health care: implementation strategies in residential, inpatient and community settings. *Australasian Psychiatry*, 25(5), 451-455.
- Lederman, O., Ward, P., Firth, J., Maloney, C., Carney, R., Vancampfort, D., . . . Rosenbaum, S. (2018). Does exercise improve sleep quality in individuals with mental illness? A systematic review and meta-analysis. *J Psychiatr Res*, Nov 3(109), 96-106.
- Lee, I. M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., & Katzmarzyk, P. T. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *The Lancet*, 380(9838), 219-229.
- Legrand, F. D., & Neff, E. M. (2016). Efficacy of exercise as an adjunct treatment for clinically depressed inpatients during the initial stages of antidepressant pharmacotherapy: An open randomized controlled trial. *Journal of Affective Disorders*, 191, 139-144.
- Littlecott, H. J., Moore, G. F., Moore, L., & Murphy, S. (2014). Psychosocial mediators of change in physical activity in the Welsh national exercise referral scheme: Secondary analysis of a randomised controlled trial. *The International Journal of Behavioral Nutrition and Physical Activity* Vol 11 2014, ArtID 109, 11.
- Martin, H., Beard, S., Clissold, N., Andraos, K., & Currey, L. (2017). Combined aerobic and resistance exercise interventions for individuals with schizophrenia: A systematic review. *Mental Health and Physical Activity*, 12, 147-155. doi:10.1016/j.mhpa.2017.04.003.
- Martinsen, E. (1995). The effects of exercise on mental health in clinical populations. *European Perspectives on Exercise and Sport Psychology*, 71-84.
- Martiny, K., Refsgaard, E., Lund, V., Lunde, M., Sorensen, L., Thougaard, B., . . . Bech, P. (2012). A 9-week randomized trial comparing chronotherapeutic intervention (wake and light therapy) to exercise in major depressive disorder patients treated with duloxetine. *The Journal of Clinical Psychiatry*, 73(9), 1234-1242.
- Martiny, K., Refsgaard, E., Lund, V., Lunde, M., Thougaard, B., Lindberg, L., & Bech, P. (2015). Maintained superiority of chronotherapeutics vs. Exercise in a 20-week randomized follow-up trial in major depression. *Acta Psychiatrica Scandinavica*, 131(6), 446-457.
- Marzolini, S., Jensen, B., & Melville, P. (2009). Feasibility and effects of a group-based resistance and aerobic exercise program for individuals with severe schizophrenia: A multidisciplinary approach. *Mental Health and Physical Activity*, 2(1), 29-36. doi:10.1016/j.mhpa.2008.11.001.
- Mason, O. J., & Holt, R. (2012). Mental health and physical activity interventions: a review of the qualitative literature. *Journal of mental health (Abingdon, England)*, 21(3), 274-284. doi:10.3109/O9638237.2011.648344.
- Meekums, B., Karkou, V., & Nelson, A. (2015). Dance movement therapy for depression. *Cochrane Database of Systematic Reviews*(2), 1-54.
- Moran, J., Kelly, G., Haberlin, C., Mockler, D., & Broderick, J. (2018). The use of eHealth to promote physical activity in patients with mental health conditions: a systematic review. *HRB Open Research*, 1.
- Murphy, S. M., Edwards, R. T., Williams, N., Raisanen, L., Moore, G., Linck, P., . . . Moore, L. (2012). An evaluation of the effectiveness and cost effectiveness of the National Exercise Referral Scheme in Wales, UK: a randomised controlled trial of a public health policy initiative. *Journal of Epidemiology and Community Health*, 66(8), 745-753. doi:10.1136/jech-2011-200689.



- Naci, H., & Ioannidis, J. (2013). Comparative effectiveness of exercise and drug interventions on mortality outcomes: metaepidemiological study. *Bmj*, Oct 1(347), f5577.
- Park, A. L., McDaid, D., Weiser, P., Von Gottberg, C., Becker, T., Kilian, R., & Network, H. (2013). Examining the cost effectiveness of interventions to promote the physical health of people with mental health problems: a systematic review. *BMC Public Health*, 13, 787. doi:10.1186/1471-2458-13-787
- Pearsall, R., Smith, D. J., Pelosi, A., & Geddes, J. (2014). Exercise therapy in adults with serious mental illness: a systematic review and meta-analysis. *BMC Psychiatry*, 14(1), 117. doi:10.1186/1471-244X-14-117.
- Rethorst, C., Sunderajan, P., Greer, T., Grannemann, B., Nakonezny, P., Carmody, T., & Trivedi, M. (2013). Does exercise improve self-reported sleep quality in non-remitted major depressive disorder? *Psychological Medicine*, 43(4), 699-709.
- Rethorst, C., Toups, M., Greer, T., Nakonezny, P., Carmody, T., Grannemann, B., . . . Trivedi, M. (2013). Pro-inflammatory cytokines as predictors of antidepressant effects of exercise in major depressive disorder. *Molecular Psychiatry*, 18(10), 1119-1124.
- Rhodes, R. E., Temple, V. A., & Tuokko, H. A. (2011). Evidence-based risk assessment and recommendations for physical activity clearance: cognitive and psychological conditions. *Applied physiology, nutrition, and metabolism = Physiologie appliquee, nutrition et metabolisme*, 36 Suppl 1, S113-153. doi:https://dx.doi.org/10.1139/h11-O41.
- Richardson, C., Faulkner, G., McDevitt, J., Skrinar, G., Hutchinson, D., & Piette, J. (2005). Integrating Physical Activity Into Mental Health Services for Persons With Serious Mental Illness. *Psychiatric Services*, 56(3), 324-331. doi: 10.1176/appi.ps.56.3.324.
- Rosenbaum, S., Lederman, O., Stubbs, B., Vancampfort, D., Stanton, R., & Ward, P. (2016). How can we increase physical activity and exercise among youth experiencing first-episode psychosis? A systematic review of intervention variables. *Early intervention in psychiatry*, 10(5), 435-440. doi:http://dx.doi.org/10.1111/eip.12238.
- Schuch, F., Morres, I., Ekkekakis, P., Rosenbaum, S., & Stubbs, B. (2017). A critical review of exercise as a treatment for clinically depressed adults: Time to get pragmatic. *Acta Neuropsychiatrica*, 29(2), 65-71.
- Schuch, F., Vancampfort, D., Firth, J., Rosenbaum, S., Ward, P., Silva, E., . . . Stubbs, B. (2018). Physical activity and incident depression: a meta-analysis of prospective cohort studies. *Am J Psychiatry*, 175(7), 631-648.
- Schuch, F., Vancampfort, D., Richards, J., Rosenbaum, S., Ward, P., & Stubbs, B. (2016). Exercise as a treatment for depression: A meta-analysis adjusting for publication bias. *Journal of Psychiatric Research*, 77, 42-51.
- Schuch, F. B., Dunn, A. L., Kanitz, A. C., Delevatti, R. S., & Fleck, M. P. (2016). Moderators of response in exercise treatment for depression: A systematic review. *Journal of Affective Disorders*, 195, 40-49. doi:10.1016/j.jad.2016.01.014.
- Searle, A., Haase, A. M., Chalder, M., Fox, K. R., Taylor, A. H., Lewis, G., & Turner, K. M. (2014). Participants' experiences of facilitated physical activity for the management of depression in primary care. *Journal of Health Psychology*, 19(11), 1430-1442.
- Slay, J., & Robinson, B. (2011). *In this together: building knowledge about co-production*. London: New Economics Foundation.
- Stanton, R., & Happell, B. (2014). Exercise for mental illness: A systematic review of inpatient studies. *International Journal of Mental Health Nursing*, 23(3), 232-242. doi:10.1111/inm.12045.
- Stanton, R., & Reaburn, P. (2014). Exercise and the treatment of depression: A review of the exercise program variables. *Journal of Science and Medicine in Sport*, 17(2), 177-182.
- Stathopoulou, G., Powers, M. B., Berry, A. C., Smits, J. A. J., & Otto, M. W. (2006). Exercise Interventions for Mental Health: A Quantitative and Qualitative Review. *Clinical Psychology: Science and Practice*, 13(2), 179-193.

- Steinberg, H., & Sykes, E. A. (1985). Introduction to symposium on endorphins and behavioural processes; review of literature on endorphins and exercise. *Pharmacology Biochemistry and Behavior*, 23(5), 857-862.
- Strid, C., Andersson, C., Forsell, Y., Öjehagen, A., & Lundh, L. G. (2016). Internet based cognitive behaviour therapy and physical exercise – Effects studied by automated telephone assessments in mental ill health patients; a randomized controlled trial. *British Journal of Clinical Psychology*, 55(4), 414-428. doi:doi:10.1111/bjc.12111.
- Stubbs B, Vancampfort D, Hallgren M, Firth J, Veronese N, Solmi M, Brand S, Cordes J, Malchow B, Gerber M, Schmitt A. EPA guidance on physical activity as a treatment for severe mental illness: a meta-review of the evidence and Position Statement from the European Psychiatric Association (EPA), supported by the International Organization of Physical Therapists in Mental Health (IOPTMH). *European Psychiatry*. 2018 Oct 1;54:124-44.
- Tiihonen, J., Lönnqvist, J., Wahlbeck, K., Klaukka, T., Niskanen, L., Tanskanen, A., & Haukka, J. (2009). 11-year follow-up of mortality in patients with schizophrenia: a population-based cohort study (FIN11 study). *The Lancet*, 374(9690), 620-627.
- Torrent, C., Amann, B., Sánchez-Moreno, J., Colom, F., Reinares, M., Comes, M., . . . Vieta, E. (2008). Weight gain in bipolar disorder: pharmacological treatment as a contributing factor. *Acta Psychiatrica Scandinavica*, 118(1), 4-18.
- Toups, M., Carmody, T., Greer, T., Rethorst, C., Grannemann, B., & Trivedi, M. (2017). Exercise is an effective treatment for positive valence symptoms in major depression. *Journal of Affective Disorders*, 209, 188-194.
- Usher, C., Thompson, A., Griebeler, M., Senders, A., Seibel, C., Ly, R., . . . Shinto, L. (2018). Meals, Mindfulness, & Moving Forward: A feasibility study to a multi-modal lifestyle approach in early psychosis. *Early Intervention in Psychiatry*. doi:http://dx.doi.org/10.1111/eip.12546.
- van Hasselt, F. M., Krabbe, P. F., van Ittersum, D. G., Postma, M. J., & Loonen, A. J. (2013). Evaluating interventions to improve somatic health in severe mental illness: a systematic review. *Acta Psychiatrica Scandinavica*, 128(4), 251-260. doi:10.1111/acps.12096.
- Vancampfort, D., Rosenbaum, S., Schuch, F., Ward, P., Probst, M., & Stubbs, B. (2016). Prevalence and predictors of treatment dropout from physical activity interventions in schizophrenia: a meta-analysis. *General Hospital Psychiatry*, 39, 15-23. doi:https://dx.doi.org/10.1016/j.genhosppsych.2015.11.008.
- Vancampfort, D., Rosenbaum, S., Schuch, F., Ward, P., Richards, J., Mugisha, J., . . . Stubbs, B. (2017). Cardiorespiratory Fitness in Severe Mental Illness: A Systematic Review and Meta-analysis. *Sports medicine (Auckland, N.Z.)*, 47(2), 343-352. doi:10.1007/s40279-016-0574-1
- Vancampfort, D., Wyckaert, S., Sienaert, P., De Herdt, A., De Hert, M., Rosenbaum, S., & Probst, M. (2016). Concurrent validity of the International Physical Activity Questionnaire in outpatients with bipolar disorder: Comparison with the Sensewear Armband. *Psychiatry Research*, 237, 122-126.
- Warburton, D. E., Bredin, S. S., Jamnik, V. K., & Gledhill, N. (2011). Validation of the PAR-Q+ and ePARmed-X+. *The Health & Fitness Journal of Canada*, 4(2), 38-46.
- World Health Organization. (n.d.). Global Strategy on Diet, Physical Activity and Health. Retrieved from: <https://www.who.int/dietphysicalactivity/pa/en/>.
- Wright, K., Armstrong, T., Taylor, A., & Dean, S. (2012). 'It's a double edged sword': A qualitative analysis of the experiences of exercise amongst people with Bipolar Disorder. *Journal of Affective Disorders*, 136(3), 634-642.
- Wynaden, D., Barr, L., Omari, O., & Fulton, A. (2012). Evaluation of service users' experiences of participating in an exercise programme at the Western Australian state forensic mental health services. *International Journal of Mental Health Nursing*, 21(3), 229-235.
- Zhang, Z., & Chen, W. (2018). A Systematic Review of the Relationship Between Physical Activity and Happiness. *Journal of Happiness Studies*, 1-18.



[mentalhealth.org.uk](https://www.mentalhealth.org.uk)

 [mentalhealthfoundation](https://www.facebook.com/mentalhealthfoundation)

 [@mentalhealth](https://twitter.com/mentalhealth)

 [@mentalhealthfoundation](https://www.instagram.com/mentalhealthfoundation)



Registered Charity No. England 801130 Scotland SCO39714.  
Company Registration No. 23508466.