

Operation recovery: a feasibility study of an eight week exercise and lifestyle programme within an Irish first episode psychosis service

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Abstract

Purpose – Early interventions focusing on exercise and lifestyle are important for individuals with a diagnosis of psychosis due to increased risk of poor physical health and reduced life expectancy. This study aims to test the feasibility of a multicomponent lifestyle intervention for individuals with first episode psychosis (FEP).

Design/methodology/approach – Individuals attending an Irish FEP service were invited to engage in an eight-week programme including individual and group exercise sessions, group educational sessions and one dietician consultation. Physical activity, physical health, mental health, cognition and personal goals measures were completed pre- and post-intervention and analysed using descriptive statistics. Feasibility data was collected via a non-standardised participant questionnaire and informal data on completion of measures and engagement with the programme.

Findings – Ten participants with a diagnosis of FEP completed the intervention. Participants were satisfied with the intervention and adherence rates were high for weekly individual gym sessions but lower for group exercise and education sessions. Mean time spent engaging in physical activity increased and sedentary behaviours decreased. Participants indicated increased readiness for change with 90% moving to the action or maintenance stages of change. Participants attained 74% of their personal goals. There were no changes in average body mass index, cognition or mental health. Data relating to blood pressure, blood tests and steps was missing or incomplete.

Originality/value – This study indicates an eight-week exercise and lifestyle programme is feasible and acceptable in a clinical setting. Recommendations relating to satisfaction, clinical markers and resource requirements are made for future studies.

Keywords Exercise, Physical activity, Early intervention, First episode psychosis, Lifestyle programme

Paper type Research paper

Introduction

Individuals who develop a psychotic illness are at increased risk of poor physical health and a reduced life expectancy compared to the general population (Curtis *et al.*, 2015; Gates *et al.*, 2015; Parks *et al.*, 2006; Saha *et al.*, 2007). Treatment with anti-psychotic medication has been clearly linked with weight gain and obesity, hyperlipidaemia, insulin resistance, hypertension and metabolic syndrome, which often develop within 12 weeks of commencing medication (Curtis *et al.*, 2015). However, modifiable risk factors such as smoking, substance use, poor diet, reduced physical activity, increased sedentary behaviours, overweight and obesity also contribute to these inequalities

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Funding: This research received no specific grant from any funding agency, commercial or not-for-profit sectors.

The authors would like to thank the Senior Management Team in Cavan Monaghan Mental Health Service for providing funding to deliver this intervention. The authors would like to acknowledge the efforts of the COPE team (Dr Naeem Amjad, Brenda McQuaid, Denise Downey, Dr Attracta McGlinchey, Dr Ryan O'Neill, Caroline Craven) who helped to deliver this intervention and conduct the research. The authors thank the steering group members from Cavan Monaghan Community Mental Health Teams, Health Promotion, Primary Care Physiotherapy and Community Dietetics, RCSI, University of Ulster and the individuals who assisted in the delivery of the programme including Monaghan and Cavan Leisure Centres.

Received 26 March 2022

Revised 19 April 2022

Accepted 9 June 2022

The current issue and full text archive of this journal is available on Emerald Insight at: <https://www.emerald.com/insight/2398-8819.htm>



Irish Journal of Occupational Therapy
50/2 (2022) 73–81
Emerald Publishing Limited [ISSN 2398-8819]
[DOI 10.1108/IJOT-03-2022-0014]

(Gates *et al.*, 2015; Matthews *et al.*, 2018). Of note, in a global meta-analysis, 55% of individuals with a serious mental illness did not meet the international recommended weekly physical activity guidelines for all adults of 150 min of moderate intensity exercise (Vancampfort *et al.*, 2017).

Exercise and lifestyle programmes for people with psychosis have demonstrated achievable, but limited outcomes in terms of weight loss or prevention of further weight gain, which do not persist after intervention (Gates *et al.*, 2015). Researchers highlight the importance of early interventions to prevent deteriorations in physical health and weight gain rather than interventions which aim to reduce weight at a later stage of treatment (Firth *et al.*, 2016; Gates *et al.*, 2015; WHO, 2010). The first year of treatment appears to be a crucial time for intervention with factors which contribute to more success at this stage including being younger, lower body mass index (BMI), absence of metabolic disorders, increased motivation and a greater ability to implement positive lifestyle changes (Firth *et al.*, 2016; Gates *et al.*, 2015). Although there are promising outcomes, there is a lack of consistency across interventions in terms of frequency, intensity, duration and type of exercise (Rosenbaum *et al.*, 2016). Interventions focused mainly on increasing physical activity or improving diet (or a combination of both) (Abdel-Baki *et al.*, 2013; Blouin *et al.*, 2009; Firth *et al.*, 2016; Killackey *et al.*, 2011; Pedley *et al.*, 2018). Interventions varied in duration with programmes lasting from 8 weeks up to 18 months (Curtis *et al.*, 2015; Firth *et al.*, 2016; Killackey *et al.*, 2011; Larsen *et al.*, 2019; Rosenbaum *et al.*, 2016; Pedley *et al.*, 2018). The programmes varied in intensity with interventions ranging from zero to three weekly exercise sessions (Rosenbaum *et al.*, 2016). Programmes offered a varying level of supervision, for example, group instruction (Larsen *et al.*, 2019), supervision during gym sessions (Firth *et al.*, 2016) or occasional link-ins with researchers (Killackey *et al.*, 2011). Studies used a variety of primary outcome measures, such as weight, BMI and waist circumference, blood pressure, dietary intake, physical activity level, and bloods measures, in addition to secondary outcomes such as motivation, self-efficacy, quality of life and psychiatric symptomology (Gates *et al.*, 2015).

Existing studies with first episode psychosis (FEP) populations appear to be mainly conducted in the UK (Firth *et al.*, 2016; Pedley *et al.*, 2018), Australia (Curtis *et al.*, 2015; Gates *et al.*, 2015; Killackey *et al.*, 2011) or Canada (Abdel-Baki *et al.*, 2013; Blouin *et al.*, 2009). No previous studies have been published focusing on physical health and lifestyle programmes in FEP programmes in an Irish context.

The present study involved the development of a multicomponent lifestyle intervention by a multi-disciplinary steering group within one mental health service in the Irish Public health system. The aim was to develop an intervention which was based on current evidence, but which was acceptable within the realities of Irish clinical practice. An eight-week intervention was developed focusing on increasing physical activity and improving physical health and well-being in individuals with FEP in an Irish context.

The aim of this study was to test the feasibility, using National Institute for Health and Care Research criteria (Shanyinde *et al.*, 2011), of this multicomponent lifestyle

intervention for individuals with FEP. The objectives of this study were to determine:

- the acceptability of the intervention and level of overall satisfaction from a service user perspective;
- responsiveness of clinical markers to inform the design of future effectiveness studies; and
- resource requirements for clinical staff to deliver the intervention.

Methods

Design

A pre-post uncontrolled feasibility study was conducted within the FEP service in the mental health service in Cavan and Monaghan, Ireland. Ethical approval was received from the Health Service Executive Dublin North East Research Ethics Committee in February 2016. The FEP service was a specialised assessment and treatment service for individuals aged 16 years and over, who present with a first episode of psychosis. The study was conducted between March and May 2016.

Study population

The FEP service is responsible for a mainly rural population across two counties of approximately 140,000 (Central Statistics Office, 2017). On average, since 2012 there have been 38 referrals per year to the FEP service.

All adults aged 18 and older who were accepted to the FEP service in 2015 and 2016 were eligible to participate in the study. The main exclusion criteria were:

- being in an acute stage of psychosis; or
- medically unfit to exercise as determined by the individual's general practitioner (GP).

A total of 12 places were available for participants in this intervention based on the budget which was available for the feasibility study. This was divided into six places in two different sites. The team occupational therapist approached the most recently referred individuals from both counties first to invite them to participate in the study. Each individual on the service user list was then approached in reverse chronological order until all 12 participants were recruited.

Each participant met with the one of the researchers who explained the research study in detail and provided them with an information leaflet on the study. Participants were informed of their right to withdraw from the study at any stage without this affecting their clinical care. Participants gave informed written consent to participate in all aspects of the programme.

A total of 21 individuals were contacted with regards to participating in the intervention. Nine individuals declined to participate for reasons including work or educational commitments, lack of motivation or interest in exercise interventions, dislike of groups and distance to the gym or cost of travelling to the gym.

Intervention

The exercise and lifestyle programme, known as Operation Recovery, was coordinated by the occupational therapists in each site. A steering group was established in advance of the intervention to design and implement the programme. The

steering group included the FEP team (consultant psychiatrist, senior registrar, occupational therapists, psychologists, social workers), physiotherapists and dieticians from primary care, a physical activity coordinator from the health promotion department, with academic support from a professor of physiotherapy. The eight-week intervention comprised five interrelated components informed by previous research, expertise from the steering group and taking into consideration the budget available for the programme:

- an information session for participants and family members prior to the programme;
- one individual exercise session per week with a personal trainer in a community gym;
- one group exercise session per week with a personal trainer in a community gym;
- a weekly multi-disciplinary lifestyle group, with a focus on motivational interviewing, dietary advice, healthy cooking, budgeting and shopping skills; and
- one individual consultation with a community dietician.

Each participant set up to five personal goals for the programme and this enabled the programme to be individualised to the needs of the participants.

Participant and family information session

One evening time information session was organised by the team social worker at a venue located centrally for both sites. This occurred prior to the first week of the programme. This information session was organised based on feedback from the steering group, in recognition of the impact of family on dietary choices and physical activity engagement. Many of the individuals invited to participate in the programme lived at home with their parents and did not have responsibility for food preparation or shopping.

Presentations were delivered by a dietician focusing on the importance of healthy diet and by a physical activity coordinator focusing on physical activity. The team occupational therapist provided information on the programme and its format.

Exercise sessions

The occupational therapist and physiotherapist met with each personal trainer prior to the programme to provide some education regarding the needs of the group.

Individual personal training sessions were offered for one hour per week. Exercise sessions included cardiovascular and weights based training. The majority of sessions were conducted in the gym or small training rooms, however some sessions were conducted on running tracks and soccer pitches depending on the interests of participants.

Group exercise sessions lasted between 45 min and 1 h. Sessions included a warm-up, main session and cool down. The sessions were changed each week and included activities such as spinning, aerobics, TRX, tennis, circuits and a “triathlon” which involved stationary bikes, rowing machines and treadmills.

Participants were contacted by text message on a weekly basis to increase attendance and motivation to participate in the programme. A basic pedometer was provided to participants as a motivational tool (McDonough *et al.*, 2013). Brief instructions on using same were provided by the team occupational therapists. Participants were advised to wear the pedometer every day for the duration of the study and to record

their steps on a daily basis in an activity diary which was provided.

Educational group

The educational group was organised and co-facilitated by the team occupational therapists. One group was held in each site. This educational group focused on aspects of lifestyle intervention looking at the importance of engaging in exercise, having a healthy diet and skills training on how to be more active. Guest speakers were invited to the group sessions to deliver specific components of the intervention. Two sessions were delivered by dieticians focusing on dietetic support, including the food pyramid, food labelling, and sugar and fat. One session was delivered by a physiotherapist and one by a physical activity coordinator focusing on physical activity, including the World Health Organisation’s recommendations for physical activity participation (WHO, 2010), motivation and goal setting. The team registrar co-facilitated a session focusing on weight gain and anti-psychotic medication and behavioural strategies to manage cravings. Community mental health nurses delivered sessions on smoking and alcohol. A representative from the local sports partnership in each area provided information on local community organisations and resources for physical activity based on goals and interests identified by participants. In addition, opportunities were provided for practicing healthy cooking during some sessions.

Dietary support

A 1-h individual dietary consultation was offered to each participant by the HSE community dietician. As the community dietician service is by GP referral only, a letter was sent to each participant’s GP requesting a referral for the purposes of the Operation Recovery programme. This consultation focused on reviewing the participant’s diet and lifestyle, providing evidence based recommendations and collaborating to set dietary goals to improve the participant’s overall diet and health.

Outcome measures

A pre- and post-intervention design was used (Thiese, 2014) to evaluate the direct impact of the exercise and lifestyle programme on a range of outcomes. A control group was not used as this was a small clinical-based intervention. Clinical measures were completed pre-intervention and immediately post-intervention focusing on physical activity, physical health, cognition, mental health and personal goals. As this was a feasibility study, it was decided to complete a comprehensive battery of clinical measures (Table 1).

Physical health measures were completed by the participant’s community mental health nurses and the first and second authors (XX and YY) in their roles as FEP team occupational therapists. Body weight was measured using a Tanita Body Composition Analyser. Waist circumference, blood pressure and blood measures were collected from participants’ clinical notes if completed in the previous one month or were completed by a member of the community mental health team. Mental health and cognitive assessments were completed by the psychologists and team registrar. Goal related assessments were completed by XX and YY. A non-standardised questionnaire was used to collect feedback on the programme itself by XX and YY (Appendix). Additional informal data was

Table 1 Overview of clinical measures completed

Physical health	Mental health/Cognitive	Personal goals
Weight, height, BMI	Scale for the Assessment of Positive Symptoms (SAPS) (Andreasen, 1984a)	Goal Attainment Scaling (GAS) (Kiresuk and Sherman, 1968)
Waist circumference	Scale for the Assessment of Negative Symptoms (SANS) (Andreasen, 1984b)	Marcus's Self-efficacy Questionnaire (Marcus et al., 1992)
Blood pressure	Wechsler Adult Intelligence Scale (WAIS IV) (Wechsler, 2008)	Readiness to Change Questionnaire (Marcus et al., 1992)
Blood measures	Delis-Kaplan Executive Function System (D-KEFS) (Delis et al., 2001)	The Rosenberg's Self-esteem Scale (Rosenberg, 1965)
Pedometer	Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) (Randolph, 1998)	Non-standardised evaluation questionnaire
International Physical Activity Questionnaire (IPAQ) (Craig et al., 2003)	Adaptive Behaviour Assessment System-Second Edition (ABAS-II) (Harrison and Oakland, 2003)	
Sedentary Behaviour Questionnaire (SBQ) (Rosenberg et al., 2010)		
Non-standardised dietary questionnaire		

collected by XX and YY on feasibility of outcome measures including completion time and quality of completion of measures and engagement with each aspect of the programme.

Data and handling and statistical analysis

Participant questionnaires were evaluated using a qualitative content analysis to describe the acceptability of the programme from the experience of participants (Sandelowski, 2000).

Data was collected from each measure at both timepoints and input into coded excel spreadsheets by the team occupational therapists. Basic descriptive statistics were used to evaluate changes from pre- to post-intervention using excel. Participant goals were rated on a five-point scale using the Goal Attainment Scaling (GAS) in a collaborative process between the first two authors and participants. A composite GAS T-score was calculated using Kiresuk and Sherman's (1968) formula to provide an overall rating for the achievement of goals for participants. This is the most frequently used method of expressing GAS scores in mental health studies (Kearns Murphy and Shiel, 2019), with a score of approximately 50 indicating that participant or intervention goals were attained.

Results

Twelve participants were recruited from the FEP service between January and March 2016. The study sample was made up six female and six male subjects. One male participant withdrew from the intervention due to the distance to travel to the intervention location and one female participant had poor engagement with the intervention and follow up data collection.

Ten participants completed the intervention and assessment process (Table 2). Each participant had a diagnosis of FEP and was currently taking anti-psychotic medication. All participants were of Caucasian background. The average age of the participants was 34.2. Participants included two full-time mothers and two individuals in full-time employment. Two participants were attending a rehabilitation training course and four participants were unemployed.

Table 2 Participant demographics and programme participation

Characteristics	(n = 10)
Average age, years (range 20–45)	34.2 (SD 9.84)
Gender, %	50%F, 50%M
Employment status	
Full time employment	2 (20%)
Training course	2 (20%)
Full time parent	2 (20%)
Unemployed	4 (40%)
Average baseline BMI (range 20.6–44)	28.15 (SD 7.18)
Average baseline IPAQ (minutes per week)	102.5
Average baseline SBQ (hours per week)	43.475
Intervention component	No. of sessions attended
Personal training (1 h sessions)	5.6/8 (range 4–8)
Group exercise (1 h sessions)	3.6/8 (range 0–8)
Education group (1.5 h sessions)	4.8/8 (range 1–8)

Participants attended 70% of personal training sessions, 45% of group exercise sessions and 60% of education group sessions (Table 2). A wide range in attendance was noted with one individual attending every session and one individual not attending any group exercise sessions due to work commitments.

Physical health

Physical activity and sedentary behaviour

Physical activity and sedentary behaviour questionnaires were completed by all participants taking approximately 15–20 min in total during one session. Participants required minimal prompting to complete both outcome measures.

Self-reported changes in minutes spent engaging in physical activity per week were recorded using the IPAQ (Table 3). The total number of minutes per week spent engaging in physical activity (vigorous, moderate or walking) increased from 1,025 min at pre-intervention to 2,120 at post-intervention. Each individual's physical activity was converted to weekly Metabolic Equivalent of Task (MET) minutes, indicating that

Table 3 Summary of IPAQ, SBQ, BMI, GAS, self-efficacy and readiness to change measures

Participant	Pre MET minutes per week	Pre activity category (IPAQ)	Post MET minutes per week	Post activity category (IPAQ)	SBQ		Pre BMI	Post BMI	T-score	Self-efficacy (change from pre- to post)	Readiness to change (change from pre- to post)
					Pre SBQ (hours)	Post SBQ (hours)					
1. Male 43 years	2970	Moderate	9084	High	21.75	26.75	25.7	25.6	68.15	3	2
2. Female 20 years	33	Low	678	Low	59.25	47.25	23.9	25.6	40.97	0	1
3. Male 26 years	3600	Moderate	4095	High	31.5	29	23.3	22.3	50	3	2
4 Female 26 years	1600	Moderate	1158	Low	72.5	51	24.5	24.2	62.04	−3	0
5. Male 45 years	2772	Moderate	5118	High	33.25	53	38.1	37.8	63.68	5	0
6. Male 45 years	1733	Moderate	4932	High	49	33.5	20.6	23.9	58.72	−5	1
7. Male 22 years	990	Moderate	3410	High	46	33	26.6	26	58.72	3	2
8. Female 35 years	598	Low	2184	High	32	31.5	22.7	24.4	68.24	14	1
9. Female 38 years	1638	Low	2382	High	41.5	30.25	32.1	31.7	65.05	4	1
10. Female 42 years	0	Low	3066	High	48	37.5	44	42.2	60.89	14	2
Average	1593.4		3610.7		43.475	37.275	28.15	28.37	59.65	3.8	1.2

the average MET minutes increased from 1,593.4 MET minutes per week to 3,610.7 MET minutes per week. Eight participants moved to a more active category at post-intervention. Although one participant (no. 2) did not progress from the low activity category, they increased their activity level during the programme. One participant (no. 4) decreased their activity level moving from moderate to low category.

Self-reported changes in total hours spent engaging in sedentary activities per week were recorded using the SBQ (Table 3). Seven participants reported a decrease in the number of hours they spent engaging in sedentary activities per week, one participant reported minimal change and two participants reported an increase in sedentary activities per week post-intervention. The mean sedentary behaviour hours decreased from 43 h per week to 37 h per week.

BMI

Weight and BMI were recorded pre- and post-intervention using the Tanita scales. There was no change in average BMI from pre- to post-intervention (Table 3). At pre-intervention the BMI of five participants was within the healthy range, two participants were in the overweight range, two were in the obese range and one in the extremely obese range. One participant's BMI changed from the healthy to overweight range at post-intervention.

Other physical health measures

All participants completed the dietary questionnaire pre- and post-intervention. Participants required minimal assistance to complete this non-standardised questionnaire taking approximately 10–15 min. The information from the dietary questionnaires was used to support participants to set personal goals for the intervention rather than using the questionnaire as an outcome measure.

Data was incomplete or missing for most participants for waist circumference and blood pressure. Data was incomplete for blood measures for a significant number of participants and thus could not be analysed for the group. Overall compliance with the pedometer was poor with most participants not using the pedometer or returning the devices for analysis. Therefore, data on average steps could not be analysed.

Mental health and cognitive performance

A comprehensive battery of neuropsychological and psychiatric assessments was administered pre- and post-intervention. These assessments were completed over a period of approximately 2 h at each time point. No significant differences were observed in cognition or psychiatric symptoms post-intervention.

An average improvement was noted in self-efficacy from pre- to post-intervention according to the Marcus's self-efficacy questionnaire (Table 3).

The baseline readiness to change questionnaire indicated that five participants (50%) were at the contemplation stage of change, three participants (33%) at preparation and one participant each at the action and maintenance stages of change (20%). At post-intervention, eight participants indicated they had moved to the action stage of change, while one participant (10%) was at the preparation stage of change and one participant was at the maintenance stage of change (10%).

Personal goals

Goal attainment

GAS was used to evaluate goal attainment during the intervention. At pre-intervention each participant set between three and five goals for their participation in the programme. A total of 39 goals were set by participants relating to dietary changes (e.g. increasing fruit and vegetable intake, reducing sugar intake and eating breakfast daily), reducing smoking, increasing activity levels and exercise participation.

Participants achieved 29 (74%) of the 39 individualised goals which were set at baseline at the expected level, or higher than expected. Participants made some progress towards six individualised goals which were slightly less achieved than expected. Four goals did not change. The average T-score was 59.65 (Table 3) suggesting that goals were attained above the expected level during the intervention (Kiresuk and Sherman, 1968).

Programme feedback

Participants were very positive about the Operation Recovery programme and their engagement in it. All participants rated

the personal training sessions, the group gym sessions and the educational group as very good or excellent.

I found the programme brilliant. No negatives. (P8)

In addition, participants noted that the programme was “great fun” (P7).

Three participants highlighted challenges of accessing the gym as they lived up to 40 kilometres from the centre where the programme took place.

It was difficult to travel to each session. (P4)

An additional challenge highlighted by two participants was finding time to fit the intervention into their weekly schedule as it involved attendance on two separate days.

Participants highlighted the important social aspect of the programme, emphasizing the importance of the peer support, and meeting new people. One participant highlighted the impact the intervention had on their socialization outside of the programme.

It has made me want to get up and do things. I'm more outgoing and talking to people. (P5)

Participants highlighted the impact of the programme on their physical health, noting improved energy and improved fitness. One participant emphasised the impact of the intervention on his fitness for work. In addition, participants emphasised a greater awareness of healthy diet and increased physical activity. The reason for participating in exercise had also changed for some participants.

I now want to be more physically active; Doing exercise because I like it and not because I feel I should. (P10)

Participants also highlighted that the programme impacted on their mental health and noted the impact of the intervention on their confidence.

This was an unbelievable exercise for a healthy and fit mind and body and building back your confidence. (P8)

Participants built in exercise into their weekly routine, often exercising regularly at home as well as attending the intervention session.

Discussion

This study aimed to test the feasibility of an exercise and lifestyle programme for individuals with a FEP. The study focused on feasibility outcomes in terms of acceptability, satisfaction, clinical markers and resource requirements for individuals with FEP in an Irish context. Participants were satisfied with the intervention and adherence rates were high for weekly individual gym sessions but reduced for group exercise and group education sessions. The study and intervention were resource intensive for FEP staff despite the small number of participants with approximately 30h required for outcome measurement both pre- and post-intervention and 1.5h per week required to deliver the group education sessions. The personal trainers delivered an additional 11h of intervention per week. This is the first such study in an Irish context and provides promising data to support the implementation of exercise and lifestyle programmes for this population.

The eight-week intervention was shorter than many other exercise and lifestyle programmes in previous studies (Rosenbaum *et al.*, 2016). Similar to Larsen *et al.* (2019),

participant feedback indicated that eight weeks was an appropriate duration of the intervention. Although the programme intensity of two structured sessions per week fit with previous studies (Rosenbaum *et al.*, 2016), the participants highlighted challenges with the number of sessions due to the location of the programme and other commitments such as work.

Participants highlighted that their experience of the programme was positive overall in the non-standardised questionnaire. In addition, participants reported satisfaction with the level of support during the programme. The programme was acceptable to the participants, and this was supported by the level of engagement in the sessions. Recruitment (57%) and retention (83%) rates were high and support the acceptability of the programme. It is recommended that future programmes include a larger number of participants and consider multiple venues to accommodate participants who live a distance from the gym location. Alternatively, it would be worth considering the option of delivering some components of the programme, such as the group exercise and educational components virtually (Killackey *et al.*, 2011) or considering more accessible interventions such as walking interventions (McDonough, 2021; Williams *et al.*, 2019).

A large number of outcome measures were chosen for the purposes of this feasibility study which required multiple sessions to complete both pre- and post-intervention. It is suggested that the number of outcome measures for future programmes would be shortened due to the burden on participants in a short timeframe. The most beneficial measures to identify changes in physical activity were the IPAQ and SBQ. Both these measures were self-completed questionnaires which were quickly completed by participants. It is suggested that the simple physical activity questionnaire (Rosenbaum *et al.*, 2020) is used in future studies to reduce the number of measures as this is specific measure for physical activity and sedentary behaviour in individuals with serious mental illness. Individualised goals have been identified as a key outcome in other FEP studies (Fredrikson *et al.*, 2014) and the GAS was a beneficial outcome measure to identify progress with personal goals relating to physical activity and diet. The non-standardised dietary questionnaire provided useful information which assisted in completing the GAS. Cognitive and psychiatric measures were time consuming and did not identify any significant changes during the eight-week intervention period. Therefore, these measures would not be required in future programmes.

It was beneficial to record participant's BMI. However, similar to previous studies (Gates *et al.*, 2015), participants did not experience weight loss during the eight-week intervention. Younger age and lower BMI are linked with greater success in physical health interventions. The participants in this study were older than the average age in FEP programmes (Rosenbaum, 2016) and 50% had a BMI in the overweight or higher range. This may have impacted on the outcomes observed in this study.

A major challenge in the study was ensuring that other physical health measures were completed, including waist circumference, blood pressure and blood measures. It is essential that one individual, such as a community mental health nurse, has the responsibility of completing these

measures for future programmes to ensure that the measures can be consistently completed.

Participants were provided with limited instructions or training on using pedometers and did not use them on a consistent basis. Several participants reported taking off the pedometers going to bed and forgetting to put them on the next day. A recommendation for future programmes would be to provide participants with a fitness tracker watch and specific training, rather than a pedometer which would not need to be removed at night-time as this may increase compliance.

Study limitations and future research

This study is limited by the small, homogenous sample. The project budget restricted the numbers of places available for participants in this current study.

Although this study aimed to examine the resource requirements required to deliver the intervention, a limitation was that the exact time spent on planning and organising the programme, completing assessments or delivering the intervention was not continually collected and monitored. Thus, this research cannot clearly outline the exact resource requirements for successful delivery. Specific funding was not requested, or provided, for clinical or research hours. A large number of outcome measures were used, thus the team occupational therapists were challenged to follow up on completion and compliance alongside their regular clinical caseloads. This likely impacted on the poor compliance with pedometer use and physical health measurement. It is essential that additional resource hours are provided for within future programmes to ensure successful delivery and to clearly capture the resource requirements.

It is planned to build on this study in the future by extending the programme so that it is open to all individuals with severe and enduring mental illness within the community mental health team and offering the programme in alternative locations. The research team aim to secure future funding to facilitate a larger randomised control trial in multiple locations to evaluate the Operation Recovery programme. In addition, a longer term follow up would be beneficial to identify any longer term impact on physical activity, sedentary behaviour or clinical outcomes.

Conclusion

This feasibility study describes an eight-week multi-component lifestyle programme within an Irish FEP programme. Participant engagement and feedback indicates that this is an acceptable intervention from a service user perspective. However, it is recommended that a greater number of participants and alternative venues or virtual interventions are considered to support participant engagement. This study makes specific recommendations regarding outcome measures for future studies. In addition, it is recommended that one individual, such as a community mental health nurse, has responsibility for completing physical health and blood measures in future programmes.

Declaration of conflicting interests: The authors confirm that there is no conflict of interest.

Ethical standards: The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committee on human experimentation with the Helsinki Declaration of 1975, as

revised in 2008. This work received ethical approval from Dublin North East Research Ethics Committee in 2016.

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Further reading

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Appendix

Figure A1 Operation recovery programme questionnaire

What has your experience been of participating in the operation recovery programme? (Please tick the relevant box below)

	Personal trainer sessions	Gym group sessions	Education group sessions	Gym Location	Education Group Location
Excellent					
Very Good					
Good					
Fair					
Poor					

What were the positives of partaking in the programme?

What were the negatives of partaking in the programme?

What (if anything) would you change about the programme? (e.g. education programme, exercise)

How has it impacted on your daily life?

Have you achieved your personal goals for the programme? (Please tick the relevant box).

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

What are your goals for the future in terms of physical health e.g. exercise, diet?

What support (if any) will you need in the future to achieve your physical health goals?

Any additional comments

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