

**Facilitators and barriers to adoption and maintenance of healthy diets and physical activity among the serious mentally ill, from patients', families, and providers' perspectives: a qualitative systematic review.**

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## Table of Contents

Review Question / Objectives .....	4
Introduction.....	4
Inclusion Criteria .....	7
<i>Types of Participants.....</i>	<i>7</i>
<i>Phenomenon of Interest.....</i>	<i>7</i>
<i>Types of Studies .....</i>	<i>7</i>
<i>Search strategy .....</i>	<i>7</i>
<i>Assessment of methodological quality.....</i>	<i>8</i>
<i>Data extraction .....</i>	<i>8</i>
<i>Data synthesis.....</i>	<i>9</i>
<i>Assessing certainty in the findings.....</i>	<i>9</i>
Results .....	9
Methodological quality.....	11
Description of the included studies .....	12
Discussion .....	17
References .....	37
Appendix I: Search Strategy .....	44

## Summary of Findings

Facilitators and barriers to adoption and maintenance of healthy diets and physical activity among the seriously mentally ill, from patients', families, and providers' perspectives: a qualitative systematic review.					
Synthesized finding	Type of research	Dependability	Credibility	ConQual Score	Comments
Social barriers—stigma and access are significant barriers to healthy eating and physical activity.	Qualitative	Moderate	Low Downgrade 1 level*	Low	*Downgraded one level due to mixture of 14 U + 7 C
The disabling physical and psychological symptoms of mental illness, medication side effects and accompanying co-morbid conditions are significant barriers to healthy eating and physical activity.	Qualitative	Moderate	Low Downgrade 1 level*	Low	*Downgraded one level due to mixture of 36 U + 4 C
Structured wellness/health promotion programs that include provider and family support and the opportunity to establish connections with others facilitate accomplishment of healthy eating and physical activity.	Qualitative	Moderate	Low Downgrade 1 level*	Low	*Downgraded one level due to mixture of 59U + 12C
Physical activity enhances enjoyment in life and well-being and can positively impact mental health symptoms.	Qualitative	High	High	High	36 U + 1 C Not downgraded as >97% of findings are unequivocal

## **Review Question / Objectives**

This systematic review addresses the barriers and facilitators surrounding the adoption and maintenance of a healthy diet and physical activity among the seriously mentally ill (SMI) population. Specifically, this review examined: (1) the barriers and facilitators to adopting healthy dietary habits and active lifestyle behaviors, and (2) the responses of the SMI population to different approaches that have been employed in addressing these challenges.

## **Introduction**

There are 44.7 million adults in the United States (18.3%) suffering from any mental illness (AMI) and only 10.4 million of this population (4.2%) suffers from serious mental illness.<sup>1</sup> Serious Mental Illness (SMI) “is defined as a mental, behavioral, or emotional disorder resulting in serious functional impairment, which substantially interferes with or limits one or more major life activities”.<sup>1(p.1)</sup> It generally encompasses diagnoses of disorders such as refractory depression, schizophrenia, schizoaffective disorder or bipolar disorder. Bartels observed that people with SMI experience “high rates of comorbid chronic health conditions, with major consequences on life expectancy, functioning, community tenure, health care costs”,<sup>2(p.153)</sup> and overall economic costs. There is a life expectancy gap of 13-30 years between the SMI and the general population, from modifiable risks of physical health conditions,<sup>3</sup> likely attributable to the higher incidences of cardiovascular disease, metabolic disease, diabetes and respiratory illness in this population.<sup>4</sup>

The economic costs of SMI are significant. Insel’s SMI economic cost assessment showed that mental health disorders contribute to 6.2% of the nation’s spending on healthcare or about \$100.1 billion dollars in direct spending, while indirect costs amounted to \$24.3 billion in disability benefits and \$193.2 billion to lost income.<sup>5</sup> The SMI are the largest and fastest growing group of social security disability beneficiaries in the US.<sup>6</sup>

Obesity contributes to health disparities in the SMI population. The SMI are 1.5 to 2.0 times more likely to be obese, with obesity occurring in 41% of men and 50% of women.<sup>9</sup> Daumit et al. report that 80% of people with SMI are either overweight or obese, with increased mortality rate three times more than the general population.<sup>10</sup> The metabolic effects of second generation antipsychotic medications contribute to obesity resulting in weight gain and hyperglycemia.<sup>9,11</sup> Lack of physical exercise, sedentary lifestyle, and diets that are high in fat, and low in fiber, are among the health behaviors issues that further contribute to this obesity problem.<sup>4,8,12,13</sup>

Sedentary lifestyles add to the problem of overweight and obesity in this population. The 2015-2020 physical activity and dietary guidelines of U.S. Department of Health and Human Services urge all American adults to avoid inactivity and engage in “at least 150 minutes per week of moderate-intensity physical activity and perform muscle-strengthening exercise 2 or 3 days a week.”<sup>14(p.1)</sup> Like most Americans, the SMI population are non-adherent to these guidelines. Compared to the general population, the SMI are more sedentary, with only about 25% engaging in recommended amounts of

physical activity.<sup>15</sup> For the SMI, walking is the primary if not the only form of exercise. They are less likely to engage in any form of moderate or high intensity exercise;<sup>9</sup> and have less access to exercise/physical fitness facilities.<sup>15</sup> Browne et al. advocated for “walking groups therapy” to facilitate physical exercise among the SMI population due to its accessibility, feasibility and simplicity in implementation.<sup>13</sup> More so, ‘walking group therapy’ requires no equipment, can be conducted by a trained layperson and has the potential of breaking the barriers of social isolation that is common in the SMI population.<sup>13</sup>

Many SMI individuals are unable to work, do not drive and as a result, depend on public assistance for both their housing and feeding. The SMI are twice as likely to fall below the U.S. census poverty threshold as their peers without mental illness,<sup>16</sup> and their choices of housing, transportation and diets are limited. Other barriers to adequate dietary intake include psychotic delusion about food, fear and social isolation, forgetting to eat due to poor memory, absence of specific cultural foods in inpatient settings, good or poor appetite for food due to medications and lack of motivation due to the illness.<sup>17</sup>

In light of high incidence of co-morbid conditions, overweight status, obesity and challenges to physical activity and healthy eating, it appears that psychiatric services should be integrated with primary care and that the integrated care plan include health promotion and disease prevention. Bartels cautions that the success of a lifestyle intervention program in improving physical fitness and reducing obesity among the SMI depends on the program’s duration and design.<sup>18</sup> Adaptations recommended for the SMI include longer duration of interventions, increased and frequent face to face contacts<sup>19</sup> the use of trained professionals to deliver manualized programs or activity-based programs such as exercise and nutrition or a combination of physical activity and education.

Improved nutrition and physical activity may not only be beneficial physically but may also have a positive impact on mood and emotional status. The field of nutritional psychiatry has noted that lack of essential nutrients contributes to the onset of poor mental health manifesting as anxiety, depression, bipolar disorder, schizophrenia and ADHD. It stresses that the foods we eat directly affect the structure and function of our brains and eventually our mood<sup>20</sup> which is critical in both motivation and physical activity. The psychological benefits of exercise have been noted to be comparable to that of psychotherapy in two meta-analyses of outcomes of patients with depressive symptoms and have been credited for improving secondary symptoms such as low self-esteem and social withdrawal.<sup>21, 22, 23.</sup> Ward and colleagues noted that prior life intervention programs for the SMI population were largely based on extrapolations and assumptions (de-novo) of health promotion designs which are deemed appropriate for SMI, instead of known facts from working with this group.<sup>24</sup> Rebar and Taylor observes that the overall efficacy of physical activity interventions depends on persons’ behavioral dispositions but for the SMI there are distinct facilitators and barriers to physical exercise that are not included in current behavior change theories and standard interventions for the general population.<sup>23</sup> Therefore, understanding these facilitators and barriers from the patients’ perspective is critical in designing a successful and acceptable intervention program for this population.

The JBI database of Systematic Reviews and Implementation Reports, Cochrane, PubMed and CINAHL were searched for existing reviews and four reviews were found. One of the reviews examined the impact of exercise therapy in the adults with SMI.<sup>26</sup> In this review, eight randomized control studies (RCT) were identified and six compared exercise and usual care. One study compared two forms of exercise—cycling program with muscle strengthening and toning exercise, while the remaining study assessed the impact of adding specific exercise advice and motivational skills to a simple walking exercise routine. The review found that exercise results in modest improvement on exercise activity but has no noticeable impact on symptoms of mental illness, BMI and weight.

The second review examined motivating factors and barriers towards exercise in the SMI.<sup>27</sup> Out of twelve (12) studies identified, nine (9) were reviewed. While physical health improvement accounted for 91% of the overall primary incentive to participate in physical exercise, the review specifically identified weight loss as the most popular reason (83%) for engaging in physical exercise. The second and third motivating factors were psychological, and they are improvement in mood (81%) and reduction in stress (78%). For the barriers, low mood and stress were identified as the most prevalent (61%) followed by the most significant socio-ecological factor, lack of support (50%).

The third review looked at already tested lifestyle interventions, with the goal of using it to improve the physical health of adults with SMI and it was done by rating the quality of different methods of lifestyle interventions outcome.<sup>28</sup> The study reviewed twenty-three articles including single-group reports, quasi-experimental studies and randomized control trials (RCT). Behavioral techniques were the most common intervention used in the studies to increase both dietary habits and level of physical activity. The objectives of most of the reviewed studies were to improve knowledge of weight management, exercise, physical activity, dietary /nutrition skills and healthy eating, and health promotion. The impact of lifestyle interventions on health outcomes especially weight loss and modifiable risk factors for physical health problems such as cardiovascular diseases and diabetes were presented. The review noted underrepresentation of racial and cultural minorities in the studies reviewed which limits its generalizability.

The fourth review was a narrative synthesis of quantitative, qualitative and mixed methods studies on the incentives and barriers to lifestyle interventions for the SMI, especially persons with schizophrenia.<sup>29</sup> Fourteen studies in the narrative synthesis included: 2 quantitative systematic reviews, 5 randomized control trials, 1 quasi-experimental study, 3 qualitative studies, 2 observational studies and one literature review. All of the studies recognized the benefits of lifestyle interventions in weight management and reduction of modifiable risks of cardiovascular disease, diabetes and metabolic issues. Recommendations included urging nurses and other healthcare professionals to consider issues that encourage and discourage the SMI from participating in these healthy lifestyle interventions. As most of the studies captured the perspective of care providers, the authors noted the need for further studies on possible barriers and incentives from patients' perspective.

This review examined the qualitative literature capturing both the perspectives of persons living with SMI as well as those working directly with this population in both professional and coaching roles as to barriers and facilitators to adoption and maintenance of healthy physical and dietary lifestyles. An understanding of the perceptions / experiences of the SMI should guide the design and testing of acceptable lifestyle intervention approaches for this population.

## **Inclusion Criteria**

### *Types of Participants*

This review considered studies that dealt with adult individuals (18 years of age or older), suffering from serious mental illness (SMI). For this review, SMI is the National Institutes of Health and National Institute of Mental Health definition, that Serious Mental illness (SMI) “is a mental, behavioral, or emotional disorder resulting in serious functional impairment, which substantially interferes with or limits one or more major life activities”.<sup>1(p.1)</sup>

### *Phenomenon of Interest*

This review explored the facilitators and barriers to healthy diets and active lifestyle among the SMI.

### *Context*

This review targeted SMI individuals that resided in the community and were being treated with either first or second-generation antipsychotic medications.

### *Types of Studies*

This review considered qualitative studies published in English including designs such as descriptive qualitative, phenomenology, grounded theory, action research, personal narratives, mixed method and ethnographical studies.

## **Methods**

This review followed the JBI approach for qualitative systematic reviews<sup>30</sup>. An *a priori* protocol was approved in December 6, 2018.

### *Search strategy*

The search strategy used a three-armed approach and was aimed at reviewing both published and unpublished studies written in English. The initial approach was a search of PubMed and CINAHL databases using the initial key words of “serious mental illness”, “physical activity” “exercise” and “nutrition”. All retrieved citations were then analyzed for text words from both the titles and abstracts and relevant index terms. Phase two of the search involved a more extensive database-specific search using the additional key words and index terms (healthy diets, active lifestyle, physical activity; exercise, diet, serious mental illness, schizophrenia, bipolar disorder, major depressive disorder, schizoaffective, barriers and facilitators, adult, refractory depression, health promotion). The databases searched during

this phase included: CINAHL, PubMed, Scopus, PsychInfo & Web of Sciences (see Appendix I for searches for different databases). Unpublished work was searched for through the Virginia Henderson Nursing Library and Proquest Dissertation. The database search was completed between July 30, 2018 and August 2, 2018. The third phase of the search strategy involved citation chasing of selected articles. Hand searches of American Psychiatric Association (APA) profile of journals were conducted. No additional articles were retrieved in this phase

### *Study selection*

Following the search, all citations were collated and uploaded into EndNote X8 (Clarivate Analytics, PA, USA) for Windows and duplicates were removed. The titles and abstracts retrieved from this phase were independently reviewed by at least two authors for appropriateness based on the question and inclusion and exclusion criteria. The independent assessments were compared, and any differences were resolved by joint review. Those deemed appropriate were subsequently retrieved in full text, re-reviewed against inclusion criteria and eligible studies were entered into Joanna Briggs Institute System for the United Management, Assessment, and Review of Information (JBI SUMARI). Papers not meeting the inclusion criteria were recorded in an exclusion table (see Appendix II).

### *Assessment of methodological quality*

The assessment of methodological quality for selected studies were done independently by two reviewers using Joanna Briggs Institute's qualitative review checklist<sup>30</sup> to determine appropriateness for inclusion in the review. For a study to be selected for inclusion, there was a preliminary review of the article for questions 2 (congruity between the research methodology and the research question), 4 (congruity between the research methodology and the representation of the analysis of data) and 8 (participants and their voices are adequately represented) which were deemed essential. Papers not meeting any of these three criteria were excluded without further review. Those meeting these criteria were further reviewed using the full complement of 10 questions. Disagreements between the two reviewers were resolved through discussion with the third reviewer.

### *Data extraction*

Data extraction from included studies in the review was completed by two independent reviewers using JBI- qualitative review data extraction tool.<sup>30</sup> Results from each reviewer were cross-checked, and any differences were discussed and clarified before entering the information into JBI SUMARI. Extracted data included specific details about the study methods, the population, context, phenomenon of interest and conclusions specific to the review question. Findings and relevant illustrations for each finding were verbatim extractions taken from the publication. A level of validity or credibility was then assigned to each finding and accompanying illustration with options of unequivocal (evidence beyond reasonable doubt), credible (plausible) or unsupported. Authors of primary relevant papers were to be contacted to request



missing or additional data. Outreach was made on one paper, first to the primary author and then to the workplace where the author had listed employment with no response.<sup>51</sup>

### *Data synthesis*

Extracted findings were pooled using methods outlined in the JBI approach for qualitative systematic reviews.<sup>30</sup> Extracted findings were compiled and were subjected to frequent readings by two researchers after which they were coded and grouped into draft categories based on similarity in meaning. The categories inclusive of findings and illustrations were subsequently re-reviewed by the full research team at which time categories were refined and defined and all findings re-reviewed for fit. The full research team then grouped the categories based on common meaning into final meta-synthesis statements.

### *Assessing certainty in the findings*

The level of confidence (trust) in the synthesized findings was determined using the JBI ConQual approach<sup>31</sup>. In this process, the level of confidence is rated as high, moderate, low or very low for each separate synthesis statement based on the dependability of the primary studies which contributed to the synthesis statement and the credibility of the research findings from these studies. Dependability is determined by examining the results of 5 questions from the JBI Critical Appraisal Checklist for Qualitative Research. These five questions (questions 2, 3, 4, 6 and 7 of the appraisal form) are aggregated and represent the strength of the research approach used in the study.

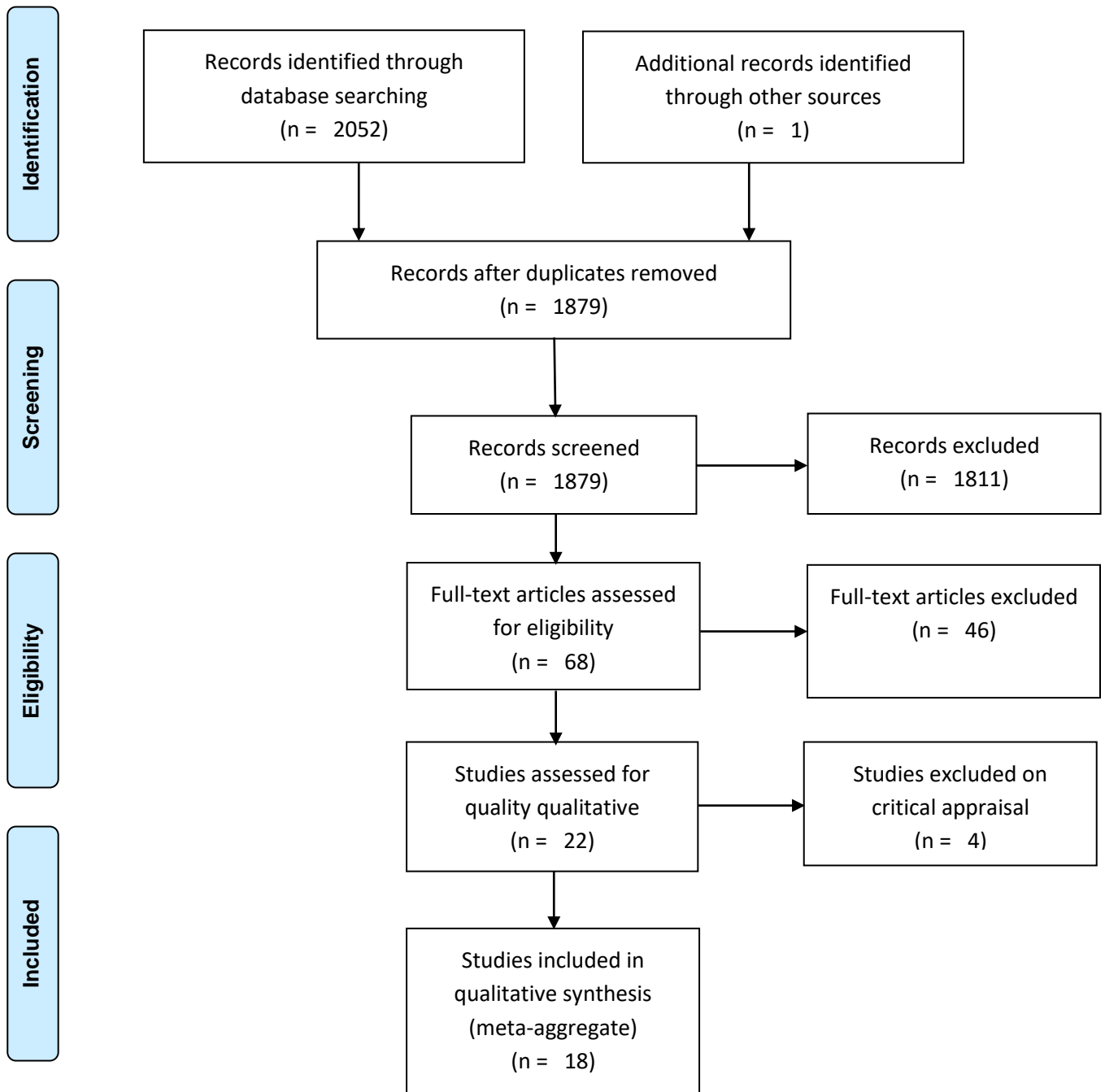
The credibility of each research finding draws from the rating of each finding as unequivocal, credible or unsupported. Credibility is high if research findings included within the synthesis are unequivocal, moderate if the findings are a combination of unequivocal and credible, low if findings are all credible and very low when a combination of credible and unsupported. Appendices V to VIII provide the data which served as the basis for the ConQual scores for each synthesis.

## **Results**

### *Description of included studies*

Figure 1 presents a diagrammatic representation of the results of the search approach and study selection process guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) method.<sup>32</sup> There were 2052 studies identified from the database search and one additional article through footnote chasing. After duplicates were removed, the total number of studies was 1879. All studies were screened for inclusion based on title and abstract at which time, 1811 studies were excluded. A total of 68 full text research articles were then assessed for appropriateness through full text review based on the inclusion and exclusion criteria. Forty-six articles were excluded after this text review leaving 22 studies that were appraised for methodological quality. Four studies were excluded following critical appraisal. There were 18 studies which were included in this review. Appendix II provides information on excluded studies and the reasons for exclusion.

**Figure 1: PRISMA flow diagram for retrieved studies, excluded, and included<sup>32</sup>**



Adapted from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

## Methodological quality

A total of 22 articles were reviewed for methodological quality. Four studies<sup>50,51,52,53</sup> were excluded because they did not meet the mandatory inclusion criteria of two independent reviewers rating “yes” to questions two, brokered by a third person if in disagreement, congruity between the research methodology and the research question or objectives, four, congruity between the research methodology and the representation and analysis of data or eight, participants, and their voices, adequately represented on the JBI qualitative review checklist. The remaining 18 studies were of moderate to high quality. Four studies<sup>33,40,44,48</sup> met all 10 of the critical appraisal criteria, three studies<sup>37,39,47</sup> met nine of the criteria, seven studies<sup>34,35,42,43,45,46,49</sup> met eight studies criteria and four studies<sup>13,36,38,41</sup> met seven of the criteria. All included studies rated positively to the criteria of congruity between methodology and research question (item 2), congruity between the research methodology and methods to collect data (item 3), congruity between research methodology and the representation and analysis of data (item 4), congruity between research methodology and interpretation of data (item 5), adequate representation of participant voices (item 8) and conclusions appropriately drawn from the analysis and interpretation (item 10). Nine studies<sup>13,34,35,38,39,41,24,45,46</sup> did not describe the relationship between the philosophical perspective and the research methodology. Seven studies<sup>13,36,38,41,43,45,49</sup> did not address the cultural or theoretical position of the researcher and eleven studies<sup>13,34,35,36,37,38,41,43,46,47,49</sup> did not discuss the influence of the researcher on the research. One older study<sup>42</sup> did not address the ethics of the study. Table 1 provides the critical appraisal of both the excluded and included studies.

**Table 1. Assessment of methodological quality of included studies**

Reference	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
<b>Excluded Studies</b>										
Bassilios <sup>50</sup>	Y	N	Y	N	Y	N	N	N	Y	Y
Fogarty <sup>51</sup>	Y	N	N	N	Y	Y	N	N	Y	Y
Glover <sup>52</sup>	Y	N	N	N	Y	Y	N	N	Y	Y
Huck <sup>53</sup>	Y	N	N	N	Y	Y	N	N	N	Y
<b>Included Studies</b>										

Abed <sup>33</sup>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Aschbrenner et al. <sup>34</sup>	N	Y	Y	Y	Y	Y	N	Y	Y	Y
Danielsson et al. <sup>37</sup>	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Cullen et al. <sup>36</sup>	Y	Y	Y	Y	Y	N	N	Y	U	Y
Chen et al. <sup>35</sup>	N	Y	Y	Y	Y	Y	N	Y	Y	Y
Graham et al. <sup>38</sup>	N	Y	Y	Y	Y	N	N	Y	Y	Y
Hargreaves et al. <sup>40</sup>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Johnstone et al. <sup>42</sup>	N	Y	Y	Y	Y	Y	Y	Y	N	Y
Shor et al. <sup>47</sup>	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Wright et al. <sup>49</sup>	Y	Y	Y	Y	Y	N	N	Y	Y	Y
Happell et al. <sup>39</sup>	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Lassenius et al. <sup>43</sup>	Y	Y	Y	Y	Y	N	N	Y	Y	Y
Rastad et al. <sup>45</sup>	N	Y	Y	Y	Y	N	Y	Y	Y	Y
Shiner et al. <sup>46</sup>	N	Y	Y	Y	Y	Y	N	Y	Y	Y
Sims-Gould et al. <sup>48</sup>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Browne et al. <sup>13</sup>	N	Y	Y	Y	Y	N	N	Y	Y	Y
Jimenez et al. <sup>41</sup>	N	Y	Y	Y	Y	N	N	Y	Y	Y
McDevitt et al. <sup>44</sup>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
% Yes of Included Studies	50.0	100	100	100	100	61.11	38.88	100	88.88	100

\*required criteria to move to full critical appraisal

N, No; U, Unclear; Y, Yes.

JBIC Critical Appraisal Checklist for qualitative studies:

Q1=Is there congruity between the stated philosophical perspective and the research methodology?

Q2=Is there congruity between the research methodology and the research question or objectives?

Q3= Is there congruity between the research methodology and the methods used to collect data?

Q4= Is there congruity between the research methodology and the representation and analysis of data?

Q5= Is there congruity between the research methodology and the interpretation of results?

Q6=Is there a statement locating the researcher culturally or theoretically?

Q7= Is the influence of the researcher on the research, and vice- versa, addressed?

Q8=Are participants, and their voices, adequately represented?

Q9= Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?

Q10= Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?

## Description of the included studies

Eighteen studies were included in this review. The studies were published from the period of 2006 to 2017. All used qualitative approaches with varying methodologies. Most (14) used a qualitative descriptive methodology,<sup>13,23,34,35,36,38,39,41,42,43,44,45,46,47</sup> and the remaining approaches included two that used phenomenology,<sup>40,49</sup> one using an inductive qualitative content analysis,<sup>37</sup> and one community

based participatory qualitative methodology.<sup>48</sup> Methods for data collection were also varied and included eight studies using semi-structured audiotape recorded interviews,<sup>7,33,36,40,41,42,43,46</sup> four studies using face-to-face, semi-structured audiotape recorded interviews,<sup>9,34,45,48</sup> five studies using focus groups,<sup>13,35,38,39,44</sup> and one using open-ended semi-structured audio-taped interviews.<sup>47</sup> Studies were distributed across 8 countries with 5 from United States,<sup>13,34,41,44,46</sup> 2 from Canada,<sup>38,48</sup> 4 from the United Kingdom,<sup>33,40,42,49</sup> 3 studies from Sweden,<sup>37,43,45</sup> 1 each from Ireland,<sup>36</sup> Israel,<sup>47</sup> Taiwan,<sup>35</sup> and Australia.<sup>39</sup> The total aggregate size of the sample was 440 including 378 individuals with SMI and 62 providers caring for individuals with SMI. The characteristics of the included studies are summarized in Appendix III.

### *Review findings*

A total of 169 findings were extracted from the 18 studies (see Appendix IV) and combined to form 12 categories based on similarities of meanings. The categories were then aggregated into 4 synthesized findings (meta-synthesis). Table 2 shows the number of findings that are included within each category and which categories connect to each synthesized finding. Appendix V through Appendix VIII shows each synthesis with their categories and findings. Overall two metasyntheses captured the barriers to following a healthy eating and participating in physical activity, one highlights the perceived benefits of physical activity for those with SMI and one metasynthesis describes strategies that promote engagement in a physical activity and healthy eating.

**Table 2: Results of meta-synthesis of qualitative research findings**

No of Findings	Categories	Synthesized Findings
5	Stigma	Social barriers—stigma and lack of access are significant barriers to healthy eating and physical activity.
16	Lack of access to safe and affordable options for healthy eating and activity.	
3	Physical exercise can be a double-edge sword	The disabling physical and psychological symptoms of mental illness, medication side effects and accompanying co-morbid conditions are significant barriers to healthy eating and physical activity.
4	Comorbid conditions and discomfort are a barrier to physical activity.	
13	Medication side effects are a common and disabling barrier to healthy eating and physical activity.	
20	Symptoms of severe mental illness are a barrier to healthy eating and physical activity.	
24	Program and providers need to support clients to reach health behavioral goals.	Structured wellness/health promotion programs that include provider and family support and the opportunity to establish connections with others were perceived favorably by persons with SMI in accomplishing healthy eating and physical activity.
14	Family support and positive role modeling is needed to facilitate healthy eating and physical activity.	
18	Group activities promote healthy behavior through establishing connectedness.	
15	A general awareness that physical activity and healthy eating prevent disease motivated some to act.	
18	Physical activity enhances enjoyment in life and wellbeing.	Physical activity enhances enjoyment in life and well-being and can positively impact mental health symptoms.
19	Physical activity decreases mental health symptoms by calming, distracting, and improving one's mood.	
Total Findings 169	Total categories 12	

### ***Synthesized finding 1***

#### **Social barriers—stigma and lack of access are significant barriers to healthy eating and physical activity**

This metasynthesis was created from two categories and 21 findings. People with severe mental illness face significant barriers in the form of stigma and lack of access to safe and affordable options for healthy eating and activity that must be considered in promoting healthy lifestyles for these individuals.

#### **Category 1: Stigma**

Five findings were combined in this category revealing the negative impact of social stigma, self-stigma and structural stigma to participation in physical activity.

### **Category 2: Lack of access to safe and affordable options for healthy eating and activity.**

Captured in sixteen findings was the reality of a lack of access to physical exercise options or healthy eating due to financial challenges, lack of transportation, unsafe environments, harsh weather and participating in therapeutic programs that did not promote healthy eating or activity.

### ***Synthesized finding 2***

**The disabling physical and psychological symptoms of mental illness, medication side effects and accompanying co-morbid conditions are significant barriers to health eating and physical activity.**

This metasynthesis was created from 4 categories and 40 findings. In promoting healthy eating and physical activity for persons with severe mental illness, physical and psychological symptoms associated with the illness, treatment, and co-morbid conditions must be understood and minimized as part of a therapeutic approach to care and program design.

### **Category 1: Physical exercise can be a double-edge sword**

Three similar findings made up this category. For some, physical activity was seen as a double-edged sword with negative outcomes that could “wind oneself up further” and disrupt stable periods. Some individuals were hesitant to partake in physical activity for fear that it would upset this stability.

### **Category 2: Comorbid conditions and discomfort are a barrier to physical activity.**

Four similar findings were included in this category which highlights that physical health problems, especially obesity, diabetes and leg pain were identified as additional barriers to physical activity.

**Category 3: Medication side effects are a common and disabling barrier to healthy eating and physical activity.**

Thirteen findings addressed the challenges of medication side effects. The multiple side effects of both first- and second-generation anti-psychotics are a primary barrier as they may produce lack of energy and significant tiredness as well as insatiable appetite leading to significant weight gain. Additionally, there are secondary barriers as symptoms such as tremors/involuntary muscle movements and obesity result in a poor self-image and low efficacy for healthy eating and physical activity.

**Category 4: Symptoms of severe mental illness are a barrier to healthy eating and physical activity.**

Twenty findings similarly addressed that the symptoms of mental illness serve as a significant barrier to partaking in healthy lifestyle behavior. A profound lack of motivation and sense of hopelessness and despair that accompanies severe depression and the distraction of auditory hallucinations that consume the individual with SMI are an overwhelming obstacle to healthy eating and physical activity.

### ***Synthesized finding 3:***

**Structured wellness/health promotion programs that include provider and family support and the opportunity to establish connections with others were perceived favorably by persons with SMI in accomplishing healthy eating and physical activity.**

This synthesis combined 4 categories and 71 findings highlighting the fact that for persons living with serious mental illness living in the community, access to programs which promote overall health (versus a sole focus on mental illness) are needed. This includes facilitation of health promotion around healthy eating and physical activity, staff and family awareness and support for healthy goals, and development of meaningful relationships and connectedness while participating in physical activity and nutritional programs.

**Category 1:** Program and providers need to support clients to reach health behavioral goals.

Twenty-four findings stressed that programs treating the serious mentally ill need to integrate physical activity and healthy nutrition programs/support that provides diversity in activities, multiple approaches to reinforce participation and providers, staff and peer support.

**Category 2:** Family support and positive role modeling is needed to facilitate healthy eating and physical activity.

Fourteen findings highlighted the positive role that family members could play in facilitating healthy behaviors. Family members can facilitate positive health behavior (physical activity and healthy eating) by encouraging statements, reinforcing progress that the individual has made, providing instrumental support. A powerful approach is to establish shared goals for activity and healthy eating and accomplishing them together.

**Category 3:** Group activities promote healthy behavior through establishing connectedness.

Eighteen findings described the facilitating effect of social interaction as a facilitator of healthy behaviors. For the majority, exercise and healthy eating was facilitated when done in groups as it established a sense of connectedness, not only with each other but with themselves. Being alone without connections was a significant barrier.

**Category 4:** A general awareness that physical activity and healthy eating prevent disease motivated some to act.

Fifteen findings stressed that knowledge and beliefs about the benefits of healthy eating and physical activity was a motivator to action. For some an awareness that physical activity and healthy eating prevent disease was a motivator. For others lack of knowledge and support as to how to start to exercise without injuring themselves, lack of readiness to change, and the challenge of changing cultural dietary patterns was a barrier to health promotion. Physical activity and healthy eating were included in the broader concept of healthy lifestyle which also included sleep patterns, work, or volunteer activities and mood management.



#### ***Synthesized finding 4***

##### **Physical activity enhances enjoyment in life and well-being and can positively impact mental health symptoms.**

Two categories and thirty-seven findings were joined in this synthesized finding which highlights the enjoyment accompanying physical activity and the outcome that it could improve mental health symptoms. For persons living with serious mental illness in the community, participation in ongoing structured and unstructured activity can enhance one's wellbeing and sense of self as well as improve some of the mental health symptoms experienced by the individual.

##### **Category 1:** Physical activity enhances enjoyment in life and wellbeing.

Eighteen similar findings addressed the positive feelings accompanying physical activity. Participation in physical activities generated a sense of enhanced wellbeing (increased energy, more restful sleep) and had a profound effect on mental wellbeing with evidence of increased self-esteem, self-confidence, increased body image, an overall sense of happiness, a developed sense of meaning, increased alertness and decreased stress.

**Category 2:** Physical activity decreases mental health symptoms by calming, distracting, and improving one's mood.

Nineteen findings described the positive impact of physical activity on symptoms experienced by persons with SMI. Exercise provided structure when burdened by mental health symptoms; distracting or freeing the person from the entrapment of depression, helping to calm "the voices", settling one's thoughts, and lifting the "fog" from the brain helping one to think more clearly and to develop an identity where that felt more normal.

#### **Discussion**

This systematic review asked the questions on (1) what are the barriers and facilitators to the adoption of healthy dietary habits and active lifestyle behaviors? and (2) what are the responses of the SMI population to the different approaches in addressing these challenges? The 4 synthesized statements answered the specific research questions. These statements include findings that were either a response/expectation from a client or a provider. The findings from this review can be used to guide interventions and design of programs for the SMI population. Since there is no one size fits all in patient care intervention, these expectations are crucial in designing care for the SMI.

The certainty of the evidence from this review, using the ConQual approach, was determined to be moderate to high for the 4 metasynthesis statements. All studies had high credibility with positive (yes) responses to items 2, 3, and 4. Item number 6 (statement locating the researcher culturally or theoretically) had variable responses with 61% "yes" and the remaining "no" and item number 7 the influence of the researcher on the research, and vice-versa, addressed) had variable responses with 38.88% "yes" and the remaining "no". Credibility varied across the four metasynthesis statements.

Metasynthesis 1, 2 and 3 had a mixture of unequivocal and credible findings so the credibility level was downgraded from high to moderate. Metasynthesis 4 had 97% (36) unequivocal findings and 1 credible finding. The dominance of unequivocal findings resulted in keeping the credibility score high. Consequently, when examining the recommendations from this review, one can be confident in the findings as all synthesized statements were at the moderate or high level.

***Research Question 1: What are the barriers and facilitators to adopting healthy dietary habits and active lifestyle?***

Three metasynthesis statements answered the question of identifying barriers and facilitators to healthy eating and physical activity. The first metasynthesis, composed of 2 categories and 21 findings found that there were significant social barriers that challenge those with SMI in the form of stigma and lack of access to safe and affordable options for healthy eating and activity.

Stigma as defined by Goffman is an “attribute that is deeply discrediting” and makes the person carrying it different from others and of a less desirable kind” with a quality of being “not quite human”.<sup>55(p.3,5)</sup> This perceived distinction between the normal and the stigmatized, Goffman contends, “are not two separate classes of people but the two faces of stigma, two ends of a continuum which varies according to the people, time, place and situation involved.”<sup>55(p.186)</sup> Stigma transcends race, culture, generations and nationalities. The impacts are widespread, disruptive and pervasive, affecting the “resources, family members, social relationships and coping behaviors”<sup>57(p.8)</sup> of the SMI. In a different yet similar definition, the Center for Disease Control and Prevention reinforces the discrediting component of stigma but highlights that it causes feelings of shame and isolation.<sup>58</sup>

Our findings found social stigma, self-stigma and structural stigma impacting this group. Feeling ashamed of being mentally ill led to withdrawal and passivity that hindered physical activity.<sup>43(p.743)</sup> Hesitancy to participate in physical activity outside of the home occurred as they feared unfriendly looks from others and were concerned that their symptoms would be recognized and consequently have them identified as having a mental illness.<sup>35(p.104)</sup> One person with SMI identified that they reduced the amount of their outdoor physical activity so as not to be identified as a person with a mental disorder—“I’m afraid of running into acquaintances or teachers. Because taking psychiatric drugs makes me drag my feet, my footsteps get slower. I’m afraid that they will find out and wonder if I am sick”.<sup>35(p.104)</sup>

These negative narratives and their detrimental impact on the ability to live healthy lives is similar to findings reported by Graham<sup>38</sup> and demonstrate that although perhaps invisible, self-stigma is a powerful barrier. It is “the process of adopting the public's stigmatizing opinions into one's own thoughts.”<sup>61</sup> Not only is there a negative impact due to the illness itself but the stigma attached to mental illness produces a second layer of trauma resulting in the SMI expecting to be rejected and devalued.<sup>69</sup> These expectations can become internalized leading to decreased self-esteem and social interactions as well as altering mood and anxiety levels. It clearly highlights the importance of environments that are accepting

and caring. Moreover, it calls for integration of stigma-reduction programs/approaches into routine care for the SMI.

Sigma-reduction programs targeting reduction of self-stigma use a combination of psychoeducational approaches (both professionally- and peer-led), cognitive behavioral therapy and narrative enhancement.<sup>69</sup> Psychoeducation approaches provide information on mental illness as well as debunking myths that society holds about mental illness. Cognitive behavioral therapy aims to restructure negative beliefs the individual holds about themselves and does this by taking the information they have learned from psychoeducation approaches and applying it at an individual level. The aim is to challenge inaccurate beliefs and replace them with healthier ones. Narrative enhancement is an approach that helps the individual create healthier, more positive self-stories. An innovative approach to help persons explain and understand their own views and narratives is an empowering tool—Photovoice. Here the goal is to use photography to capture one's experiences, record their personal and community strengths and struggles and to write a narrative explaining these images. These picture/stories are then used for the basis of self-reflection and group discussion. Through reflection and discussion, strategies are suggested for building relationships and responding to stigma and discrimination. Programs that have used these strategies and presented evidence of effectiveness include: Ending Self-Stigma, Narrative Enhancement and Cognitive Therapy, and Anti-Stigma Photo-Voice Intervention.

Shame also was identified with negative body image that occurred with weight gain while on antipsychotic drugs. As stated by one person "I'm 240 pounds and everyone else is 120 pounds, like I'm going to join this gym group yeah right!"<sup>38(p.217)</sup> This response of discomfort, lower self-esteem, shame and humiliation is well documented to accompany weight problems.<sup>74,75,76,77</sup> Similar to mental illness, weight problems are associated with stigma and the consequences of stigma include prejudice, neglect and discrimination. For those with mental illness and weight problems, the stigma is magnified.

Stigma also was found within health care services. One nurse caring for people with SMI identified that providers and programs limit the attention to addressing lifestyle issues as clients are stigmatized and it is assumed that persons with SMI can't change.<sup>39</sup> Evidence of mental illness-related stigma in healthcare is plentiful.<sup>77,78,79,80,81,82</sup> Happell observed that "the reluctance of some health professionals to see consumers [mental health patients] for physical health issues when requested by nurses was attributed to stigma by some and pessimism about change".<sup>39</sup> Knaak, Mantler & Szeto point out that this stigma not only is a barrier to access to mental health services but is associated with disparities in quality of care provided to persons with mental illness. Additionally, evidence shows that healthcare professionals hold similar negative opinions about persons with weight problems and these individuals also receive poorer treatment resulting in alienation and humiliation.<sup>78</sup>

Structural stigma is synonymous with institutionalized stigma. It is the inequalities, the injustices and the depravities that are imbedded at the core of the policies, rules and practices of our social

institutions against the stigmatized group such as the SMI. It refers to the rules, policies, and practices of social institutions that arbitrarily restrict the rights of and opportunities for, people with mental illnesses.”<sup>66</sup> In this review it was found that these inequalities / inadequate social benefits (a form of structural stigma) affected the SMI's ability to afford healthy food choices, safe housing, social interaction and transportation.<sup>38</sup> A participant with SMI noted *“that hinders all other aspects of having a healthy lifestyle when you have to choose whether you want to eat or if you want to have a safe, affordable place to live, it's one or the other.”* <sup>38(p.217)</sup> The lack of access to holistic services for the mentally ill may reflect overall societal and healthcare stigma.

Social barriers for the SMI include lack of access to safe and affordable options for healthy eating and physical activity. Lack of access as a barrier may stem from institutionalized stigmatization and discrimination. In this review these barriers appeared as financial challenges, lack of transportation, unsafe environments, and affordable options to participate in therapeutic programs that promote healthy eating or activity. The impact of these social barriers likely influences the disparate outcomes of the SMI. Those with SMI are twice likely to live below the US census poverty threshold and compared to those without mental illness<sup>16</sup> and invariably, their choices of housing, diets and transportation are limited. McDevitt and colleagues summed up safety concerns concluding that often these people are “feeling vulnerable and unsafe when out in public”.<sup>44</sup> The concern with safety secondary to housing vulnerability was found in this study. As stated by one provider caring for the SMI: “We have lots of people at the center that are living in unsafe places and they don't get sleep. They're afraid to go to sleep and as a result your mental health is suffering and so is your physical health.”<sup>38(p.216)</sup>

Transportation and lack of free or low cost and accessible programs /facilities that are affordable were other relevant factors that influenced lack of access. One person with SMI made this statement about lack of access, *“I like playing basketball. The problem is, if there isn't an indoor basketball court and if it's raining, how am I going to play basketball? It affects your state of mind and affects you, so you get really lazy.”*<sup>35(p. 104)</sup>

The second metasynthesis, “the disabling physical and psychological symptoms of mental illness, medication side effects and accompanying co-morbid conditions are significant barriers to healthy eating and physical activity” continues to look at barriers, now from the perspective of the disabling impact of physical and psychological symptoms and side effects of treatment. There were 4 categories and 40 findings within this metasynthesis that clearly point to the fact that one must understand the impact that symptoms and treatment side effects are having on the person in order to plan a therapeutic program.

The first category in this metasynthesis highlighted that for some, physical exercise was seen as a double-edge sword. Although the potential benefits of physical activity were acknowledged, possible negative outcomes were also identified. The potential for exercise to “wind oneself up further” and disrupt stable periods was verbalized. Keeping “stable” was the priority over taking on anything that could upset this balance. Wright et al. proposed an explanation for the double edged sword as stemming from

difficulties in regulating physical activity from hypomania to mania.<sup>49(p.638)</sup> One individual with SMI described the double edge in saying, *whilst exercise can “calm down the thoughts”, it does also “take you slightly higher”... I think, umm, it's taking you a little bit higher but it's also relaxing you at the same time, which allows you then to come back down again.*<sup>49(p.638)</sup>

The second category captures the barrier that comorbid conditions and discomfort have on physical activity. Physical health problems, especially obesity, diabetes and leg pain were identified as barriers to physical activity. There is a direct correlation between lack of physical activity and the increased risks of metabolic syndrome and disorders such as diabetes, obesity, hypertension, elevated cholesterol as well as cardiovascular disease, cerebrovascular disease and stroke.<sup>4(p.2)</sup> These conditions and the symptoms that may accompany them such as discomfort and lethargy may cause patients to be less likely to exercise. As stated by one person with SMI *“I have difficulties getting involved in physical activities because of problems I have with my legs and weakness in my body.”*<sup>47(p. 341)</sup> Clearly, if people have leg pain following activity, this negative outcome can deter additional activity. Knowing whether the person experiences any of these symptoms can aid in developing an activity program.

Clinicians also verbalized the impact that comorbid conditions had on physical activity levels of persons with SMI. One clinician observed, *“They have some other health complications but obesity I think is probably their biggest health complication. Pre-diabetes, that kind of thing”*. Clinicians also had an overall perception that these individuals were not getting the activity needed. No reasons were given for this, nor was there an analysis of whether therapeutic regimens incorporated physical activity, rather there was a blanket statement about lack of participation...*And exercise wise: I mean, none. They sit at home, watch TV. I think probably the most exercise, the most activity they get is when they come into appointments”*.<sup>13 (p. 390)</sup> Although this may be the reality for some, the comment has innuendos of stereotypical thinking and blame of the individual with SMI, common to stigmatized thinking.

The third category in this metasynthesis highlights the disabling effect of medication side effects which becomes a significant barrier to healthy eating and physical activity. The metabolic effects of second-generation antipsychotic (SGA) medications contribute to obesity resulting in weight gain and hyperglycemia.<sup>9,11,72,19</sup> McKibbin observed that the SMI have an inherent risk for metabolic issues which include weight gain, hyperlipidemia and hyperglycemia; and that obesity contributes to health disparities in this population.<sup>9</sup> Furthermore, they noted that the SMI are 1.5 to 2.0 times more likely to be obese, with obesity occurring in 41% of men and 50% of women.<sup>9</sup> This weight gain or obesity makes physical activity more difficult. One study participant *noted “Because of the medications, I can barely climb up two stairs or walk to the bus station in order to get to work”; “I feel like a pregnant woman—I tell myself, I will walk to the bus station, I walk a little bit, but it is very difficult for me to walk because of the medications.”*<sup>47p.341)</sup> Another individual stated that *“It is difficult for me to breathe because I’m overweight, therefore, I’m only walking”; “I eat less than I used to in the past, but I’m still overweight since I take 12 pills each day. . . I would like to feel as free as I used to be before I started taking medications. Then I used to go hiking*

*around the country with my back pack.*<sup>47(p. 341)</sup> Weight gain from antipsychotic medications is as a result of the medication stimulating hunger, persons on these medications eat more, their mouth is dry, and some often crave for food with high sugar content and fatty food, hence the weight gain is from the imbalance of calorie intake and those that are used up through the body resting metabolism, physical activity and exercise. These excess calories from the imbalance are stored in the body as fat.<sup>73</sup>

First-generation antipsychotic (FGA) medications are notorious for acute extrapyramidal side effects (EPS) including dystonia, tremor, bradykinesia, and akathisia. Due to their high potency, the incidence rates of EPS vary between the lower-potency FGA such as thioridazine and the high potency FGA such as haloperidol.<sup>67(p.141)</sup> These symptoms act as a barrier in part because of self-consciousness about observable symptoms. One individual observed that *“because it’s a tremor which happens, it can happen on a bus, it makes me feel very self-conscious. So that is, but if I feel shaky in the morning before I go out, I might delay it.”*<sup>42(P.527)</sup>

In addition to the side effects of the medications, the final category in this metasynthesis captured the reality that the symptoms of severe mental illness in and of themselves serve as a barrier to healthy eating and physical activity. For those suffering from depression, the symptomatic presentation may include lack of motivation, anhedonia (the loss of interest in previously rewarding or enjoyable activities), crying spells, uncontrollable sadness, feeling of helplessness, hopelessness and self-isolation.<sup>68(p.93)</sup> One client said it this way *“I have a lot of trouble especially lately motivating myself to exercise, I struggle with depression. It’s one of the hardest things is to get yourself going. Motivation! I have that problem with exercise. I just need motivation, so you know groups like this help me talk [...] and seeing other people making [...] efforts to do better with [their] health and stuff.”*<sup>13(p. 390)</sup> Providers also acknowledged that depressive symptomatology produces lack of motivation and the concomitant difficulty in engaging in physical activity: *“...part of their symptomatology is that it is very difficult to motivate them and get them to exercise, and you can talk till you’re blue in the face and sometimes they just won’t engage with it.”*<sup>39</sup>

Those suffering from schizophrenia, psychotic disorders, or depressive symptoms inclusive of psychotic features may experience symptoms such as auditory and visual hallucinations, paranoid thoughts, and persecutory delusions.<sup>68(p.111,47,50)</sup> The distraction of hallucinations, paranoid thoughts and delusions can consume the individual with SMI thereby becoming an overwhelming obstacle to healthy eating and physical activity. Patients experiencing these psychotic symptoms become paranoid and preoccupied with voices and find it difficult to go to the grocery store to buy food and also have problems in preparing the meals. Abed observed that *“those participants who were troubled by paranoid or persecutory thoughts were often afraid to leave the house, often avoided more crowded places such as supermarkets and gyms”*.<sup>33(p. 23)</sup> As a participant noted: *“I’ve ended up burning stuff and letting pans boil dry because I’ve got all this going on in my ears and I’m not paying attention to what I’m doing. I can’t concentrate on the food when I’ve got these voices in my ears”*.<sup>33(p. 23)</sup>

Management of mental health symptoms and medication side effects can in part be addressed by pharmacological adaptations, however this alone is not enough. There is evidence that metabolic side effects may be ameliorated using a non-pharmacological approach. Abed refers to a meta-analysis of non-pharmacological interventions which showed that interventions such as Cognitive Behavioral Therapy (CBT), nutritional counseling and exercise to be effective in managing the weight gain that occurs as a side effect of antipsychotic medications.<sup>33</sup> Similarly, Every-Palmer found that the SMI were interested in participating in weight loss programs, could generate ideas for weight loss but needed to engage in partnership with others to decrease barriers and increase personal motivation.<sup>83</sup> Every-Palmer and colleagues interviewed persons with SMI and weight problems and found that for some, weight gain or weight problems is viewed as something 'done to them' and beyond their control. Most of the explanation given for lack of participation in healthy eating and activity was externalized to include environmental factors, mental illness symptoms, medication side effects, lack of support, finances, and stigma. The one internal factor identified was an inability to summon the necessary motivation. All of these external and internal factors were identified in the findings of this review and it must be highlighted that these external factors are very real and are potent barriers which need to be considered in planning programs for this population.<sup>83</sup>

The third metasynthesis statement, "physical activity enhances enjoyment in life and well-being and can positively impact mental health symptoms" speaks to the facilitators to adopting active lifestyle behaviors. Participation in structured or unstructured activity can enhance one's wellbeing and sense of self as well as improve some of the mental health symptoms experienced by the individual.<sup>36,48,49</sup> This metasynthesis has two categories, physical activity enhances enjoyment in life and wellbeing and physical activity decreases mental health symptoms by calming, distracting, and improving one's mood.

Physical activity enhances enjoyment in life and wellbeing, indicates that participation in physical activities generates a sense of enhanced wellbeing (increased energy, more restful sleep) and had a profound effect on mental wellbeing with evidence of increased self-esteem, self-confidence, increased body image, an overall sense of happiness; and a developed sense of meaning, increased alertness and decreased stress. Endorphins and "the feel-good factor" derived from physical activity were helpful for both mental and physical health of the clients.<sup>36(p.61)</sup> This meant improvement in mood, alertness, energy self-image, sense of recovery, independence and freedom. One participant with SMI put it this way, *"physical activity is really important, the endorphins, I used to jog every morning for an hour, you feel so much better after it and you know it was great – it helps mentally and physically . . . you are meeting people and you have great fun."* <sup>36(p.61)</sup> Physical activity is associated with the "feelings of freedom and independence".<sup>45(p.1474)</sup> This is reflected in the quotes from persons living with SMI: *"just going for a walk gives you an incredible sense of freedom, and you feel good. You feel free when you are walking."* <sup>45(p.1474)</sup> and *"I actually become more independent . . . that you have a sense of being independent, that you can decide for yourself what you are going to do."*<sup>45(p.1474)</sup>

The second category in this metasynthesis captured the awareness that physical activity decreased mental health symptoms by calming, distracting, and improving one's mood. Exercise provided the structure when burdened by mental health symptoms that distracted or freed the person from the entrapment of depression, helping to calm "the voices", settling one's thoughts, and lifting the "fog" from the brain helping one to think more clearly<sup>49(639)</sup> and to develop an identity where that felt more normal. Physical activity was identified as crucial to recovery from mental illness.<sup>44(p.52)</sup> A participant with SMI observed that "It's a release of all the negative stuff that I'm thinking ... because I do it, and as I'm going along on the treadmill ... you get hot don't you because you're exercising, you're body's working and it releases those chemicals ... and I just think to myself ahhhhhh [relaxing sound], it's like a stress release".<sup>40(p. 89)</sup> In light of the rich qualitative evidence that physical activity reduces symptoms of mental illness as well as improving mental health, it is important for clinicians to use approaches that highlight these benefits.

Social Cognitive Theory (SCT) can be used to examine physical activity in persons living with mental illnesses. This requires attending to barriers and incentives to exercise, outcome expectations, and social support. Barriers to healthy eating and physical activity are numerous in this population. Perceived self-efficacy is a person understanding of what they can do with their existing skills to overcome obstacles. Helping persons develop positive thoughts and emotions related to exercise and healthy eating requires input as to the positive value to the person and designing approaches in small steps so that they can have positive experiences. Asking about past experiences with success and using those strategies moving forward can promote self-efficacy. A person's outcome expectations or their belief that a given activity will lead to certain positive outcomes can be motivating. Promoting the findings from this metasynthesis that physical activity enhances enjoyment in life and well-being and can positively impact mental health symptoms helps to set and maintain positive expectations which can ultimately facilitate active lifestyle behaviors.<sup>85,86</sup>

***Research Question 2: What are the responses of the SMI population to different approaches that have been employed in addressing challenges to healthy diets and activity?***

Metasynthesis 3, "structured wellness/health promotion programs that include provider and family support and the opportunity to establish connections with others were perceived favorably by persons with SMI in accomplishing healthy eating and physical activity" captures the findings answering the second research question. This synthesis combined 4 categories and 71 findings.

The first category in this group underscored the importance that programs caring for those with SMI and the providers/caretakers within these programs need to actively support clients to reach health behavioral goals. The Dartmouth Health Promotion Research team completed a research review for the SAMHSA-HRSA Center for Integrated Health Solutions and concluded that there were a limited number of programs that provide services to actively engage the SMI in health promotion<sup>18</sup>. In light of the reality that the SMI are at risk of premature death, in part due to higher levels of obesity and sedentary behavior,



it is essential that programs and providers consider health promotion activities a priority. An integrated approach that promotes both mental and physical health needs to become the paradigm of providers working with the SMI.<sup>18,60</sup> To accomplish this, mental health workers will need new approaches to assessment and treatment if the goal is promoting well-being rather than treating illness.<sup>87</sup>

To move in this direction, practitioners need to self-reflect on their approach as findings in this study reveal that sometimes, it is the mental healthcare provider who is stigmatizing the client and blaming them for their inactivity and poor dietary habits rather than being aware of the barriers this population faces and working to minimize barriers and enhance facilitators in order to achieve client engagement in health promotion. Participating in healthy activities is more than a matter of will power but as seen in this review exposure to unsafe environments, financial constraints, participation in programs that do not model healthy approaches. Additionally, clinicians need to self-examine their own biases and prejudices to determine how these attitudes are acting as a barrier to integrated behavioral and physical care and shared decision making.

Physical health and mental health are closely linked and there is growing recognition of the importance of integrating behavioral health and physical health to improve coordination of a whole-person approach.<sup>88,89</sup> A whole person approach has been associated with improved outcomes related to depression and anxiety, patient satisfaction, quality of life, improved functional status, and lower cost.<sup>90,91</sup> A whole person approach would include incorporation of interventions targeting healthy eating and physical activity.

Findings suggest that oftentimes this support for healthy eating and physical activity is lacking and there are few resources provided for developing these programs or helping the person navigate to supports in the community. As indicated in one study, *“They [participants] cited that there was a culture of not doing a lot in the facility, and to cope with this lack of activity, food served as a distraction when feeling bored.”*<sup>47</sup> This culture of inactivity in facilities to care for those with the SMI must be changed to improve health outcomes of the population. Weight loss and fitness interventions can improve health outcomes and longevity, and “a mere 5% weight loss for overweight or obese individuals is considered clinically significant and results in reduced risk factors for metabolic disorders and cardiovascular disease. In addition, improving cardiorespiratory fitness by just one metabolic equivalent per day is associated with a 10-17%, reduced mortality risk, independent of weight loss.”<sup>18</sup> In light of this data, do we not have a moral and ethical obligation to be more holistic in our approach to care?

In addition to programs offering health-focused interventions, findings from this review highlight the importance of mentors, coaches, role models and/or buddies who are supportive and non-stigmatizing for successful engagement and outcomes. In referring to having program personnel be supportive, one person with SMI, “Just make sure you have people that care about others, that aren’t going to make them feel like they are just dust under their feet or whatever, or that they are better than other people; that

doesn't go over very well, and then people don't want to come back. I know I wouldn't. It means a lot when people take the time to care and to work with you and others".<sup>46</sup> Referring to approaches for successful adaptation of healthy dietary practices the findings acknowledged the need for both easily understandable suggestions and modelling. Illustrating this combined approach and the power of the coach, one person with SMI indicated, "Trying new foods, that's very hard for me. I don't like vegetables. I like peas and asparagus you know. [My health mentor] got me to try like sweet potatoes, disgusting. She got me to try salmon, I love it. . .I love it. Oh my gosh—I saute´ it in a little bit of olive oil with some garlic and oh my gosh. Same with scallops, she got me to try those. The salmon was really. . .I tell you it took me about 5 minutes to put that first bite in my mouth, it just looked so funky but yeah I love it. . .I'm going to be trying spaghetti squash this week. . .So you know she's like 'You've got to change your attitude woman about new foods.' She's really great".<sup>46</sup>

Engagement in physical activity using gym facilities was facilitated with access along with support, not only in what program or routine to participate but to provide encouragement and support them through embarrassment and fear. Having one without the other does not provide the optimal environment for engagement, As said by one care provider, *"Open access to fitness facilities helped them engage in exercise and the presence of a health mentor at the gym enabled them to feel comfortable going to the gym, a place they had found intimidating in the past."*<sup>46</sup> Influencing sustained engagement requires guidance and support and *"prompting by a primary care physician or mental health provider was the most common reason cited by participants for changing eating habits and exercising."*<sup>46</sup>

Our findings attest to the fact that "participants found it easier to engage in physical activity when they received encouragement from healthcare professionals"<sup>35(p.102)</sup> and that *"successful adaptation of healthy dietary practices required a combination of easily understandable suggestions and modelling"*. These findings were also reported by Roberts & Bailey who found that persons with SMI valued staff who were helpful, knowledgeable, informative and approachable.<sup>65</sup> The review of the literature done by Bartels similarly concluded that education alone will not achieve substantive lifestyle and healthy behavior change but combining active participation in weight management activities and physical exercise improves the likelihood of achieving substantive lifestyle changes.

Staff can facilitate engagement by being there for and with the person to motivate and guide. As said by one person with SMI, *"The physical therapist is an important ally, as a supportive person "setting the pace" and increasing their motivation both by being attentive and by suggesting strategies to come around barriers such as pain."*<sup>37</sup> The importance of being an ally, was captured in another study that highlighted that *"Kindness of the IN SHAPE staff was an important facet of the program."*<sup>46</sup> Most described their health mentors as 'friends', they were quick to point out that the health mentors were different than other people in their lives, noting that they were supportive and non-stigmatizing.<sup>46</sup> Evidence of the motivating impact of coaching/support on engagement is reflected in the quote by this individual with *" . . . having somebody to report to. . .it makes me feel good to say 'Shirley, I went to the*

*gym three times this week', and she's proud of me because I did it. That's important to me, having somebody to say I did it, I went three times this week or I went twice this week, or I increased my reps, I increased my weights you know, that's important to me".*<sup>46(p.278)</sup>

Findings in this category confirm that there is no "one size fits all" program, rather a diversity of approaches is likely to be more successful in engaging those with SMI. Providing a menu of options and allowing the person with SMI to select their preferred activity may increase engagement as reflected in one program planners' response "*participants indicated that it is easier to engage in physical activity when the activities were self-chosen or a preferred modality.*"<sup>35</sup> Although multiple activities were identified as options for physical activity, walking, swimming, yoga, outdoor activities, and *weight lifting were found in one study as the most desired options because they were less overpowering and "they were fun, economically feasible, and had been activities they had done previously"*.<sup>48</sup> Another study, spoke to the importance of not narrowly defining activity but looked at work and volunteer activities as examples of activity that would have similar health benefits. Use of incentives, such as pedometers or tangible rewards were also identified as a motivating factor (money and prizes).<sup>13</sup> Although not mentioned in these findings, Bartels highlights the need for programs to be longer in duration, suggesting that the intensive portion of the program last 6 months followed by booster sessions to maintain engagement. This recommendation is certainly congruent with this study's findings of challenges with motivation that the SMI experience—longer programs would likely be more beneficial in managing the potential ups and downs of engagement that may come with varying mental health symptoms or side effects.

The second category within this metasynthesis is family support and positive role modeling to facilitate healthy eating and physical activity. One form of family support is ongoing encouraging statements that reinforce/ affirm progress made. One mentor made this observation about a family member and a client, "*the way he [husband] complimented her [wife] in front of me, saying, "I'm just so proud of you for sticking with this program, and I've really seen improvements in your mood," was really nice for her to hear, and me*"<sup>34(p.94)</sup> Supportive and encouraging guidance and affirmations on how to get started with health behavior change and how to maintain it are not known by most. Health care professionals, family members or other support people need to be educated on how to support someone with health behavior change. Samdal and colleagues concluded using person-centered and autonomy supportive behavioral change techniques (BCTs) that supports the use of goal setting and self-monitoring of behavior, helping individuals to define goals and to self-monitor are better strategies; and are associated with better outcomes when counseling overweight and obese adults.<sup>84</sup>

Family role modeling and shared goals is a strong facilitator to continued engagement in weight loss and activity goals. In one study, health mentors who worked with the SMI in a program called In Shape, noted: "*I have a participant who is trying to lose weight along with her adult children. She has a son with type II diabetes and two other children who are overweight. They were walking together before the In SHAPE program, but now they are really teaming up to make dietary changes to achieve their weight loss*

goals”.<sup>34(p.94)</sup> Aschbrenner and colleagues in their analysis of group discussions similarly noted that “emotional, practical and mutual support from family members and significant others were social facilitators to health behavior change while unhealthy environments were a barrier.”<sup>34,64</sup>

The practical or instrumental support noted in this review included transportation, assistance with shopping, financial support, support for dietary changes all of which were found supportive in meeting health goals. Speaking of this practical support, a mentor noted *“One of our participants lives with his aunt and uncle who were paying for his gym membership once the grant ended. The participant did well in the program and his aunt noticed his weight loss and healthier eating habits. She offered to continue paying for the membership if he went at least three times per week. That incentive kept him going”*.<sup>34(p.94)</sup>

The third category in this metasynthesis highlighted that many with SMI found that engagement in group activities were perceived more positively as they had the added benefit of establishing connectedness—with others as well as with oneself as part of a group. Being alone without connections was a significant barrier. *“Getting involved in social activities with other people, as opposed to spending the day by oneself, was a desired way to improve their own health”*.<sup>48</sup> Group activity offered a sense of friendship, a shared sense of purpose, social support and accountability. This caring community is motivational—an attribute critically needed for those with SMI. A clinician noted that *“clients described that walking with a group of individuals would give them “a sense of shared purpose”, which would serve as a strong motivator. Additionally, “having time after the walks to share experiences”*<sup>13(p. 391)</sup> promoted further connection. Noted in one study was the unexpected effect of participation in a group to be problem solving of barriers.

Whether in group activity or set up as part of support, building in accountability appeared to be a facilitator of healthy behavior change. Jimenez observed that “the primary facilitator identified by participants was having a support and accountability system in place for engaging in healthy behaviors”.<sup>41(p.6)</sup> Capturing the words of one person with SMI, *“We’ll call each other early in the morning. He’ll ask, ‘Did you go to the gym?’ If I say no, he’ll say, ‘I’m disappointed at you.’ But you see, that’s all we got, is this friendship. We have nothing, so we make the best of nothing.”*<sup>41(p.6)</sup>

The last category in this metasynthesis captured that another component important for engagement was knowledge--a general awareness that physical activity and healthy eating prevent disease. *“Preventing negative health consequences motivated participants to make positive changes in health behaviors.”* Surprisingly, there was evidence in this review that many with SMI were not aware of their personal increased risk for developing diabetes and other chronic conditions. The SMI are an at-risk group with notable disparities in health outcomes and greater efforts must be taken to improve knowledge not only of those with SMI but their professional and family caretakers.

Increasing knowledge on the benefits of physical activity and healthy nutrition and using this knowledge to create positive expectations may be one component in behavioral change, Chen et al. noted that “most participants felt exercise could improve health (e.g., helping to lose weight and reducing physical symptoms of pain and discomfort) and promote mental health (e.g., improving sleep and regulating moods)”.<sup>35(p.102)</sup> While a participant with SMI observed that *“In addition to preventing you from getting fat, exercise can lower your odds of getting some diseases. When you lose weight, you will not have some diseases related to overweight and obesity”*.<sup>35(p.102)</sup> Firth et al. while noting some of these aforementioned factors as barriers and others as motivators for physical activity among the SMI, indicated that improved understanding of anticipated results of physical activity among the SMI population will not only enhance health wellness initiatives and intervention but will optimize resources allocation.<sup>27</sup>

### **Implications for practice:**

This review makes recommendations on addressing the barriers to physical activity and healthy eating for SMI while identifying facilitators. It is evident that the current culture and standard of practice in the provision of services to the mentally ill needs to change—active measures to reduce stigma and provide integrated, supportive, holistic care is needed.

- **Reduce Stigma:** Stigma was identified as a potent barrier to health for the SMI. Although it is not reasonable to expect to eliminate stigma, positive efforts can be taken to reduce it.

First, caregivers and programs need to examine care approaches for presence of stigma, understand its impact on the person and take measures to reduce its impact. Educational programs are likely needed to increase awareness of the types of stigma and how stigma manifests. Use of surveys to monitor stigma and track change in stigma over time can help healthcare gain insight and improve policy decisions for the implementation of patient-centered care practices and social inclusion.<sup>92</sup>

As reducing self-stigma is important to move person with SMI toward independence in engagement in physical activity and healthy eating, integration of stigma-reduction programs should be considered as a routine part of care. Additionally family members should receive support and education to reduce associative stigma (which is reflected stigma to family members or relatives of the stigmatized individual) and encourage active engagement of family in promoting health of those with SMI. Sigma-reduction programs targeting reduction of self-stigma should use a combination of psychoeducational approaches (both professionally- and peer-led), cognitive behavioral therapy and narrative enhancement.<sup>69</sup>

- **Programs of care should integrate behavioral and physical health care that provides a whole person approach addressing both mental health problems and physical problems while promoting maximal wellness.** Health promotion programs that target modifiable factors leading to

chronic illness inclusive of healthy eating, physical activity, smoking cessation and safe sexual practices should be a component of the program.

- ***Assess and manage social determinants of health and social determinants of mental health which contribute to health disparities.*** Physical and mental health and many common mental disorders are shaped to a great extent by the social, economic, and physical environments in which people live.<sup>93</sup> To address inequities in health outcomes among those with SMI social determinant of health data should be used to identify patient needs. Transforming complex care should: (1) use SDOH assessment tools; (2) collect patient-level information related to SDOH; (3) create workflows to track and address patient needs; and (4) identify community-based social service resources and track referrals.<sup>94</sup>
- ***Use evidence-based behavioral change strategies adapted for the SMI***
  - ***Set SMART goals with clients.*** This review has shown the significant challenge that those with SMI have in engaging in physical activity and healthy eating. Not only should providers encourage clients to be active and adopt healthy nutritional choices, but they should use counseling approaches such as motivational interviewing to set SMART goals that can be achieved and create internal motivation for continuing.
  - ***Incorporate incentives into goal achievement:*** create incentivized reward strategies that can be used to create immediate and intermediate incentives. This could include use of pedometers and small rewards for achieving daily or weekly goals.<sup>13</sup>
  - ***Take active measures to include family or other supports:***
  - ***Offer activities that support group connection:*** a variety of group activities should be offered to increase persons engagement in physical activity and healthy eating as it provides the added benefit of building connections with others, building in options for peer-accountability support, decreasing social isolation and expanding friendships all critical to overall mental well-being.
  - ***Provide information in meaningful, straight forward ways***
  - ***Expand clinician's role to include mentor and coach for healthy behavior.*** Findings from the study demonstrated the importance of support and encouragement as crucial to meeting health goals and lack of support among clinical staff was noted as a barrier. Many clinicians and care providers lack the knowledge and skills needed to serve as a health coach. Health coaching incorporates a partnership between the coach and client to create and implement a plan for positive change towards optimal well-being. In addition to providing a structure of support and accountability, the coach will assist the client to generate solutions and strategies that overcome barriers and are aligned with the larger context of their life, so they can experience sustainable lifestyle change.<sup>95</sup>

- **Use County Health Rankings Website and other large data sets to evaluate evidence-based program options and their outcomes** associated with wellness.<sup>96</sup> This data can be used to design local programs.
- **Diverse Physical Activity Programs should be available and tailored to the individual.** As there is no one size fits all program, the ideal is to provide a diversity of physical activities that a person can opt into to keep the person enrolled and active. Activity should be suggested considering any presenting symptoms, level of activity/sedentariness, and person's interests.
  - Activity should be increased gradually in both duration and intensity so that the individual can gain a sense of accomplishment.<sup>97</sup>
  - Activity goals should be set in partnership with the person and measures to enhance accountability, such as buddy systems and check-ins should be incorporated.
  - *Group walking programs provide both activity and connection and may be more achievable for those with symptoms interfering with activity.* Walking groups facilitate physical exercise among the SMI population due to its accessibility, feasibility and simplicity in implementation as it requires no equipment and can be conducted by a trained layperson.<sup>13</sup> Walking may be more manageable for those persons experiencing groups can potential of breaking the barriers of social isolation that is common in the SMI population.<sup>13</sup>
  - Use gym trainers with an understanding of SMI to minimize intimidation experienced by the SMI over gym equipment and exercise programs.<sup>36(p.62)</sup>
  - For those living in the community and not part of a formal program, physical activity should be encouraged by care providers and navigators should assist people in identifying and accessing programs that are friendly to persons with mental illness.
  - Model programs demonstrating evidence-based positive outcomes such as the InSHAPE program can be used as a template to design programs. This program provides fitness and nutrition coaching, gym memberships, and smoking cessation counseling to improve cardiovascular health in people with serious mental illness.<sup>98</sup>
- **Healthy eating and cooking programs should be available and tailored to the individual and social determinant needs.** Establishing healthy eating programs must be done within the context of the social needs of the SMI as many are living in poverty and have resource shortages<sup>39</sup>. Additionally, many with SMI do not have cars and are dependent on public transport or walking by foot as the only means of transport. This limits how far they can travel for food shopping and often means they will end up in neighborhood stores where healthy food choices are limited and food items are more expensive.
  - **Provide** psychoeducational programs to build understanding and skills related to healthy eating.

- Model programs demonstrating evidence-based positive outcomes such as the ACHIEVE program can be used as a template to design healthy eating programs. This program considers the needs of the SMI population and divides information into small components and reinforces skills repeatedly.<sup>99</sup> Behavioral recommendations regarding healthy eating should be manageable and focused. Daumit and colleagues recommend 5 behavioral strategies including: (1) Drinking water and no “sugar” drinks; (2) eating five total servings of fruits and vegetables daily, (3) choosing smaller portions (4) refraining from junk food, and (5) choosing smart snacks.<sup>10</sup> This basic approach has been associated with similar weight loss outcomes as more complex.<sup>100</sup>
- Group homes and community-based programs should examine nutritional options and make changes to create a culture of healthy eating.

### ***Implications for Policy***

- ***Advocate for health plans to reimburse for exercise and nutrition programs for the SMI.*** In light of the significant health disparities and the financial cost associated with care of persons with chronic illness, health plans should support coverage for health promotion programs that include exercise and healthy eating. CMS covers brief weight-loss counseling, not the comprehensive counseling needed for sustained engagement in this population.
- ***Advocate for increased federal funding for social services.*** The U.S. spends more per capita on health care than all similar high income countries yet has the lowest life expectancy and some of the worst health outcomes. Many contend that a reason for this is the lack of spending on social services. The U.S. spends the least on social services and in fact is the only of the high-income countries where health care spending accounts for a greater share of the gross domestic product than social services spending.<sup>101</sup> The SMI is a population with significant social needs and health disparities. Advocating for greater funding for social services is a critical population health strategy.

### **Implication for Education:**

Findings from the study support ongoing stigma, lack of respect for persons with SMI, and lack of knowledge about the challenges that SMI persons face when trying to engage in healthy lifestyle behaviors. To this end curricular as well as professional development approaches need to be considered to minimize this gap.

- **Changing Education Curriculum:**
  - The revision of the curriculum of professional health institutions should be advocated for, to include the most recent guidelines and evidenced - based practices in the care of the SMI, as this will reduce the level of fear and ignorance, both of whom are the roots of stigma on the part of the providers.



- Mental health education should be advocated as part of early childhood education in all public schools in the country. Currently only two States (New York & Virginia) have mental health curriculum in their public schools. It will increase general awareness and possibly uproot fear and ignorance. As Paul Gionfriddo, president and CEO of Mental Health America, rightfully stated that “by educating children of all ages about mental health, the hope is that they will learn how to recognize early symptoms in themselves and their friends and seek help before a crisis develops”.<sup>70</sup>

#### **Implications for Research:**

- ConQual results show *high level of certainty* in Synthesis 3, “Physical activity enhances enjoyment in life and well-being and can positively impact mental health symptoms”. Programs need to capitalize on this strength and design and test programs that use expectancy theory to highlight the positive outcomes associated with physical activity as a motivator for initiation and continued engagement in physical activity.
- ConQual results of the 3 synthesized findings capturing barriers and facilitators showed *low level of confidence*. This calls for the need for more research using interpretive methodologies such as phenomenology, grounded theory and ethnography that will have stronger dependability.
- There was a difference between qualitative findings of persons with SMI and clinicians caring for those with SMI. There is a need research that explores clinicians and the population served to examine similarity or difference in perceptions.
- This review examined persons in the community. For many with SMI, they have transitioned across the care continuum. There is a need for qualitative research to examine health promotion programs across the continuum and whether there is coordination of these programs or goals across sites.

### **Knowledge Translation: Facility Evaluation Specific to Healthy Eating and Activity for Persons with Serious Mental Illness:**

This systematic review reinforced the value of healthy eating and activity for persons with serious mental illness and provided insight into barriers, facilitators and program structure that may be beneficial. To identify congruency between actual practice and recommendations from this review, an assessment form was developed addressing whether physical activity and healthy eating was incorporated into the program, whether staff were comfortable serving in the role of mentors for physical activity and healthy eating, whether the majority of patients in the facility are aware of the physical comorbidities associated with the side effects of medication, unhealthy diets and lack of physical activity, whether family were included in order to provide support for healthy eating and physical activity and if goals are set specific to healthy eating and physical activity. Each question is scored as Yes or No and if the answer was “Yes”, the respondent is asked to provide details. A “Yes” response indicates a more holistic program that is inclusive of health promotion specific to healthy eating and activity. The survey is meant to be a self-report by providers in the organization and as such is open to personal bias.

#### **Questions:**

1. What are the institution specific approaches to healthy eating and activity for persons with serious mental illness being treated in an outpatient program?
2. What is the congruency between institution specific programs and recommendations made emerging from this systematic review?

#### **Context:**

NSBH is an outpatient program for psychiatric / behavioral health and addiction services located in North Jersey. Most of the patient are highly functional but have been battling chronic serious mental illness and substance use disorder for a very long time. There are day and evening appointments to accommodate those that are employed. They do not have a partial care program which is for people whose level of functioning is very low. NSBH is a medium sized facility with about 15 employees that includes 3 psychiatrists, an APN, a lawyer, 3 three clerical staff and 7 social workers / therapists.

#### **Distribution of Questionnaires:**

Twelve (12) packets of questionnaires were handed out to the employees by the office manager and were asked to be returned directly to the manager by the end of the work day. Seven packets were completed and returned for a 58% response rate.

#### **Results**

Aggregate data is reported below.

Questions	Total "Yes"	Total "No"	# Comments	Comments
1. Does your organization have any programs designed to promote physical activity for persons with SMI?	4	3	3	<ul style="list-style-type: none"> <li>➤ Encourage healthy diets; gym or walking activities</li> <li>➤ Stretching -mind/body/soul.</li> <li>➤ Mindfulness &amp; stretching activities to reduce symptomatology</li> </ul>
2. Does your organization have any programs designed to promote healthy eating for persons with SMI?	4	3	3	<ul style="list-style-type: none"> <li>➤ Encourage but don't have a partial care program</li> <li>➤ Mental health IOP addresses health related goals.</li> <li>➤ MIOP – include topics related to healthy eating</li> </ul>
3. Are your Clinical staff / healthcare providers comfortable with serving as coaches, mentors or educators in working with clients and their family on the role of physical activity in preventing illness and in actually assisting individuals with activity?	5	2	5	<ul style="list-style-type: none"> <li>➤ Comfortable educating clients but not assisting (no physical contact)</li> <li>➤ NO, not this setting.</li> <li>➤ Most clients sufficiently knowledgeable about the topic</li> <li>➤ Exercise to reduce symptoms of anxiety. Referrals and education regarding local resources</li> <li>➤ NO, not for this setting</li> </ul>
4. Are your Clinical staff / providers comfortable with serving as coaches, mentors or educators in working with clients and their family on strategies for healthy eating in preventing illness and in actually assisting individuals with strategies?	4	3	1	<ul style="list-style-type: none"> <li>➤ NO, contact, not a partial care facility where hands on treatment is needed.</li> </ul>
5. Do you think that the majority of your patients are aware of the physical comorbidities associated with the side effects of medication, unhealthy diets and lack of physical activity?	5	2	4	<ul style="list-style-type: none"> <li>➤ YES, in discussion sessions.</li> <li>➤ YES, psychoeducation</li> <li>➤ YES, encourages walking in normal spring.</li> <li>➤ YES, Med management education handouts</li> </ul>
6. How does your program include family participation, support and education specific to facilitating patients' physical activity?	5	2	4	<ul style="list-style-type: none"> <li>➤ YES. only when appropriate.</li> <li>➤ YES, encouraged family outing including PA</li> <li>➤ YES, during family sessions.</li> <li>➤ YES, during family sessions</li> </ul>
7. Does your program have a routine to set "health" goals specific to physical activity?	5	2	3	<ul style="list-style-type: none"> <li>➤ YES. Only when appropriate.</li> <li>➤ YES, discussed w&amp; reviewed in treatment plan(TP).</li> <li>➤ YES, specific to each client in their TP.</li> </ul>
8. Does your program have a routine to set "health" goals specific to healthy diets?	4	3	0	
Totals	36	20	23	

Percentage %	64.3%	35.7%		
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## Discussion

There were a total of 36 “YES” (64.3%) responses and 20 “NO” (35.7%) responses out of a total 56 questions that were answered. Of note is the variability in responses. All surveys were from the same program such that one would anticipate more consistent results. The variability as well as the comments suggests the possibility that the interventions are more likely suggestions rather than structured interventions.

The 64.3% is a low score and some of the comments to questions such as “Not appropriate for this setting -IOP”; “When appropriate”; and “only included in the treatment plan” seem to underscore some flawed assumptions in the institution’s approach to wellness care. IOP offers a structured setting generally targeting overcoming symptoms of mental health, behavioral health, and/or substance abuse concerns, and allows persons to receive thorough treatment in a less restrictive environment than occurs in a partial hospitalization program, inpatient treatment or residential care.<sup>102</sup> Although perhaps more functional than those attending a partial hospitalization program, persons participating in IOP will still experience the symptoms of mental illness and side effects of antipsychotic medications which lead to metabolic syndrome and difficulties with exercise and healthy eating. A “thorough” program should incorporate health promotion.

## Action

A fact sheet summarizing the findings of this systematic review will be developed and presented to the facility staff as part of a continuing education program.

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## Appendix I: Search Strategy

Database	Search Terms
Generic keyword search	("healthy diet" OR "active lifestyle" OR exercise OR "physical activity") AND ("serious mental illness" OR "severe mental illness" OR schizophrenia OR "bipolar disorder" OR "refractory depression" OR "schizoaffective disorder" OR "major depressive disorder") AND (qualitative OR "grounded theory" OR ethnography OR descriptive OR phenomenology OR "action research" OR "case study")
PubMed	<p>("Healthy Diet"[Mesh] OR healthy diet OR "Exercise"[Mesh] OR active lifestyle OR exercise OR physical activity) AND ("Mental Disorders"[Mesh] OR serious mental illness OR severe mental illness OR schizophrenia OR bipolar disorder OR refractory depression OR schizoaffective disorder OR major depressive disorder) AND ("Adult"[Mesh] OR adult) AND ("Qualitative Research"[Mesh] OR "Grounded Theory"[Mesh] OR "Anthropology, Cultural"[Mesh] OR "Health Services Research"[Mesh] OR qualitative OR grounded theory OR ethnography OR descriptive OR phenomenology OR action research OR case study OR "Case Reports" [Publication Type])</p> <p>1569 results, English limit, July 30, 2018</p>
CINAHL	<p>(MH "Diet, Reducing" OR "healthy diet" OR MH "Exercise" OR "active lifestyle" OR exercise OR "physical activity") AND (MH "Mental Disorders" OR "serious mental illness" OR "severe mental illness" OR schizophrenia OR "bipolar disorder" OR "refractory depression" OR "schizoaffective disorder" OR "major depressive disorder") AND (MH "Qualitative Studies" OR qualitative OR "grounded theory" OR ethnography OR descriptive OR phenomenology OR "action research" OR "case study")</p> <p>194 results, Limits of English and All adults, July 30, 2018</p>
Scopus	<p>( TITLE-ABS-KEY ( ( "healthy diet" OR "active lifestyle" OR exercise OR "physical activity" ) ) AND TITLE-ABS-KEY ( ( "serious mental illness" OR "severe mental illness" OR schizophrenia OR "bipolar disorder" OR "refractory depression" OR "schizoaffective disorder" OR "major depressive disorder" ) ) AND TITLE-ABS-KEY ( ( qualitative OR "grounded theory" OR ethnography OR descriptive OR phenomenology OR "action research" OR "case study" ) ) AND TITLE-ABS-KEY ( ( adult OR adults ) ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) )</p> <p>115 results. Limit of English, August 2, 2018</p>
Web of Science	You searched for: TOPIC: (("healthy diet" OR "active lifestyle" OR exercise OR "physical activity")) AND TOPIC: (("serious mental illness" OR "severe mental illness" OR schizophrenia OR "bipolar disorder" OR "refractory depression" OR "schizoaffective disorder" OR "major depressive disorder"))

	<p>AND TOPIC: ((qualitative OR "grounded theory" OR ethnography OR descriptive OR phenomenology OR "action research" OR "case study"))</p> <p>AND TOPIC: ((adult OR adults))</p> <p>Refined by: LANGUAGES: (ENGLISH)</p> <p>Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&amp;HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC.</p> <p>39 results, Limit English, August 2, 2018</p>		
PsycINFO	<b>#</b>	<b>Searches</b>	<b>Results</b>
	1	exp EXERCISE/	23865
	2	("healthy diet" or "active lifestyle" or exercise or "physical activity").mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	73997
	3	1 or 2	75453
	4	exp Schizophrenia/	85124
	5	exp BIPOLAR DISORDER/	25110
	6	exp Major Depression/	118841
	7	("serious mental illness" or "severe mental illness" or schizophrenia or "bipolar disorder" or "refractory depression" or "schizoaffective disorder" or "major depressive disorder").mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	164335
	8	exp SCHIZOAFFECTIVE DISORDER/	2939
	9	4 or 5 or 6 or 7 or 8	258669
	10	exp QUALITATIVE RESEARCH/	7883
	11	exp Grounded Theory/	3362
	12	exp ETHNOGRAPHY/	7938
	13	exp PHENOMENOLOGY/	12650
	14	exp Action Research/	2247
	15	exp Case Report/	22831
	16	(qualitative or "grounded theory" or ethnography or descriptive or phenomenology or "action research" or "case study").mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	285393
	17	10 or 11 or 12 or 13 or 14 or 15 or 16	304708
	18	3 and 9 and 17	201
	19	limit 18 to (adulthood <18+ years> and english)	135
		135 results, limits of English and Adult, August 2, 2018	

## Appendix II: Table of excluded articles

Citation	Excluded before critical appraisal		Reason for exclusion
	Yes	No	
Armstrong K, Edwards H. The effectiveness of a pram-walking exercise programme in reducing depressive symptomatology for postnatal women. <i>Int J Nurs Pract.</i> 2004;10(4):177-94.	X		Does not meet the inclusion criteria for population.
Aschbrenner K, Carpenter-Song E, Mueser K, Kinney A, Pratt S, Bartels S. A qualitative study of social facilitators and barriers to health behavior change among persons with serious mental illness. <i>Community Ment Health J.</i> 2013;49(2):207-12.	X		Sample are people with depression from a primary care practice-Some having just started antidepressants and others just off them...Does not qualify for SMI.
Azar D, Ball K, Salmon J, Cleland VJ. Physical activity correlates in young women with depressive symptoms: A qualitative study. <i>Int J Behav Nutr Phys Act.</i> Vol 7 2010, ArtID 3. 2010;7.	X		Sample does not differentiate depression as major depressive disorders (SMI)
Bassilios B, Judd F, Pattison P. Why don't people diagnosed with schizophrenia spectrum disorders (SSDs) get enough exercise? <i>Australas Psychiatry.</i> 2014;22(1):71-7.		X	Inadequate participants voices.
Bezyak JL, Chan F, Lee E-J, Catalano D, Chiu C-Y. Physical activity in individuals with severe mental illness: client versus case manager ratings. <i>Rehabil Couns Bull.</i> 2012;56(1):62-4.	X		Quantitative methodology
Blanner Kristiansen C, Juel A, Vinther Hansen M, Hansen AM, Kilian R, Hjorth P. Promoting physical health in severe mental illness: Patient and staff perspective. <i>Acta Psychiatr Scand.</i> 2015;132(6):470-8.	X		Sample includes both SMI and substance use. Results do not differentiate between the groups.
Blue FR. Aerobic running as a treatment for moderate depression. <i>Percept Mot</i>	X		Quantitative methodology.

Skills. 1979;48(1):228.			
Brennan J, Long JV. A running therapy. J Psychedelic Drugs. 1979;11(3):243-5.	X		Case study of an individual with opioid addiction on methadone. The study focused on psychotherapy treatment.
Buchanan AM, Miedema B, Frey GC. Parents' perspectives of physical activity in their adult children with autism spectrum disorder: a social-ecological approach. Adapt Phys Activ Q. 2017;34(4):401-20.	X		Qualitative study with a focus on component of social support and not on barriers and facilitators. Population is focused on autism.
Carless D, Douglas K. Social support for and through exercise and sport in a sample of men with serious mental illness. Issues Ment Health Nurs. 2008;29(11):1179-99.	X		Qualitative study but the focus is on components of social support and did not look at the barriers and facilitators.
Carney R, Cotter J, Bradshaw T, Yung AR. Examining the physical health and lifestyle of young people at ultra-high risk for psychosis: a qualitative study involving service users, parents and clinicians. Psychiatry Res. 2017;255:87-93.	X		The population is those at risk for psychosis. This does not meet the criteria of SMI.
Chen, M-D., Kuo, Y-H, Chang, Y-C, Hsu, S-T, Kuo, C-C & Chang, J-J. Influences of aerobic dance on cognitive performance in adults with schizophrenia. Occup. Ther. Int. 2016;23:346–356.	X		Quantitative methodology
Connell J, O'Cathain A, Brazier J. Measuring quality of life in mental health: are we asking the right questions? Soc Sci Med. 2014;120:12-20.	X		Systematic review on dimensions of QOL.
Crone D. Walking back to health: a qualitative investigation into service users' experiences of a walking project. Issues Ment Health Nurs. 2007;28(2):167-83.	X		Population is not specified.
Crone D, Guy H. 'I know it is only exercise, but to me it is something that keeps me going': a qualitative approach	X		Does not describe the population-only that they were

to understanding mental health service users' experiences of sports therapy. Int J Ment Health Nurs. 2008;17(3):197-207.			participants in the trust.
Faulkner G, Biddle S. Mental health nursing and the promotion of physical activity. J Psychiatr Ment Health Nurs. 2002;9(6):659-65.	X		Sample drawn from an acute inpatient setting.
Faulkner G, Taylor A, Munro S, Selby P, Gee C. The acceptability of physical activity programming within a smoking cessation service for individuals with severe mental illness. Patient Educ Couns. 2007;66(1):123-6.	X		Quantitative methodology
Fogarty M, Happell B, Pinikahana J. The benefits of an exercise program for people with schizophrenia: a pilot study. Psychiatr Rehabil J. 2004;28(2):173-6.	X		Sample drawn from an acute inpatient setting.
Fogarty M, Happell B. Exploring the benefits of an exercise program for people with schizophrenia: a qualitative study. Issues Ment Health Nurs. 2005;26(3):341-51.		X	Unable to reach authors or the head of department to clarify that samples were drawn from the community setting.
Glover CM, Ferron JC, Whitley R. Barriers to exercise among people with severe mental illnesses. Psychiatr Rehabil J. 2013;36(1):45-7.		X	Inadequate participants voices.
Glowacki K, Duncan MJ, Gainforth H, Faulkner G. Barriers and facilitators to physical activity and exercise among adults with depression: a scoping review. Ment Health Phys Act. 2017;13:108-19.	X		Population focuses on depression.
Graham C, Rollings C, de Leeuw S, Anderson L, Griffiths B, Long N. A qualitative study exploring facilitators for improved health behaviors and health behavior programs: mental health service users' perspectives. ScientificWorldJournal. 2014;2014:870497.	X		There are no clear inclusion criteria for participation-drew sample from a psychosocial rehabilitation center... A variety of diagnoses including cognitive disorders, cannot separate out the findings based on diagnosis.
Hedlund L, Gyllensten AL. The physiotherapists' experience of basic body awareness therapy in patients with	X		Focus is on basic body awareness versus physical



schizophrenia and schizophrenia spectrum disorders. J Bodyw Mov Ther. b013;17(2):169-76.			activity.
Holley J, Crone D, Tyson P, Lovell G. The effects of physical activity on psychological well-being for those with schizophrenia: a systematic review. Abbreviation: Br J Clin Psychol. 2011;50(1):84-105.	X		Quantitative systematic review.
Hsieh S, Lee H, Kane I. Physical activity, motives for exercise, and stress in Schizophrenia. Commun Nurs Res. 2011;44:417	X		Quantitative methodology.
Huck GE, Finnicum C, Morrison B, Kaseroff A, Umucu E. Consumer perspectives on physical activity interventions within assertive community treatment programs. Psychiatr Rehabil J. 2018;41(4):312-8.		X	Inadequate participants voices.
Jimenez DE, Burrows K, Aschbrenner K, Barre LK, Pratt SI, Alegría M, et al. Health behavior change benefits: perspectives of Latinos with serious mental illness. Transcult Psychiatry. 2016;53(3):313-29.	X		Same study published in a different journal.
Kathol RG, Butler M, McAlpine DD, Kane RL. Barriers to physical and mental condition integrated service delivery. Psychosom Med. 2010;72(6):511-8.	X		Does not examine phenomenon of interest.
Kinnafick FE, Papathomas A, Regoczi D. Promoting exercise behaviour in a secure mental health setting: healthcare assistant perspectives. Int J Ment Health Nurs. 2018.	X		Secure mental health setting.
Lee H, Jolley C, Kane I, Schepp KG. Physical activity adherence and patterns of adults with schizophrenia. Commun Nurs Res. 2011;44:414.	X		Quantitative methodology
Lee H, Kane I. Adherence to physical activity in adults with serious mental illness. Commun Nurs Res. 2013;46:319.	X		Quantitative methodology

Leutwyler H, Hubbard EM, Jeste DV, Vinogradov S. "We're not just sitting on the periphery": a staff perspective of physical activity in older adults with schizophrenia. <i>Gerontologist</i> . 2013;53(3):474-83.	X		Sample includes acute as well as community setting. Results do not differentiate between the groups.
Linke SE, Noble M, Hurst S, Strong DR, Redwine L, Norman SB, et al. An exercise-based program for veterans with substance use disorders: formative research. <i>J Psychoactive Drugs</i> . 2015;47(3):248-57.	X		Population is persons with substance use disorders.
Mahy J, Shields N, Taylor NF, Dodd KJ. Identifying facilitators and barriers to physical activity for adults with Down syndrome. <i>J Intellect Disabil Res</i> . 2010;54(9):795-805.	X		Population is persons with Downs Syndrome.
McDevitt J, Wilbur J. Exercise and people with serious, persistent mental illness. <i>Am J Nurs</i> . 2006;106(4):50-4.	X		Not a research study
O'Hara K, Stefancic A, Cabassa LJ. Developing a peer-based healthy lifestyle program for people with serious mental illness in supportive housing. <i>Transl Behav Med</i> . 2017;7(4):793-803.	X		No participant voices
O'Kelly JG, Piper WE, Kerber R, Fowler J. Exercise groups in an insight-oriented, evening treatment program. <i>Int J Group Psychother</i> . 1998;48(1):85-98.	X		No participant voices
Owens C, Crone D, Kilgour L, El Ansari W. The place and promotion of well-being in mental health services: a qualitative investigation. <i>J Psychiatr Ment Health Nurs</i> . 2010;17(1):1-8.	X		Sample is not described. The only information is that they participated in the mental health trust.
Pelletier JR, Nguyen M, Bradley K, Johnsen M, McKay C. A study of a structured exercise program with members of an ICCD Certified Clubhouse: program design, benefits, and implications for feasibility. <i>Psychiatr Rehabil J</i> . 2005;29(2):89-96.	X		Mixed methods study however, qualitative component does not provide adequate patient voice.

Pickett K, Kendrick T, Yardley L. "A forward movement into life": a qualitative study of how, why and when physical activity may benefit depression. Ment Health Phys Act. 2017;12:100-9.	X		Sample does not include serious mentally ill.
Rezaie L, Shafaroodi N, Philips D. The barriers to participation in leisure time physical activities among Iranian women with severe mental illness: a qualitative study. Ment Health Phys Act. 2017;13:171-7.	X		Secure mental health setting.
Roberts SH, Bailey JE. Incentives and barriers to lifestyle interventions for people with severe mental illness: a narrative synthesis of quantitative, qualitative and mixed methods studies. J Adv Nurs. 2011;67(4):690-708.	X		Narrative review article
Searle A, Calnan M, Lewis G, Campbell J, Taylor A, Turner K. Patients' views of physical activity as treatment for depression: a qualitative study. Br J Gen Pract. 2011;61(585):149-56.	X		Sample does not include serious mentally ill.
Searle A, Calnan M, Turner KM, Lawlor DA, Campbell J, Chalder M, et al. General practitioners' beliefs about physical activity for managing depression in primary care. Ment Health Phys Act. 2012;5(1):13-9.	X		Same study published in a different journal.
Searle A, Haase AM, Chalder M, Fox KR, Taylor AH, Lewis G, et al. Participants' experiences of facilitated physical activity for the management of depression in primary care. J Health Psychol. 2014;19(11):1430-42.	X		Same study published in a different journal.
Shor R, Shalev A. Barriers to involvement in physical activities of persons with mental illness. Health Promot Int. 2016;31(1):116-23.	X		Same study published in a different journal.
Taliaferro AR, Hammond L. "I Don't Have Time": Barriers and facilitators to physical activity for adults with intellectual disabilities. Adapt Phys Activ	X		Population is those with intellectual disability.

Q. 2016;33(2):113-33.			
Temple VA, Walkley JW. Perspectives of constraining and enabling factors for health-promoting physical activity by adults with intellectual disability. J Intellect Dev Disabil. 2007;32(1):28-38.	X		Population is those with intellectual disabilities.
Thyer BA, Irvine S, Santa CA. Contingency management of exercise by chronic schizophrenics. Percept Mot Skills. 1984;58(2):419-25.	X		Quantitative methodology
Van de Vliet P, Vanden Auweele Y, Knapen J, Rzewnicki R, Onghena P, Van Coppenolle H. The effect of fitness training on clinically depressed patients: An intra-individual approach. Psychol Sport Exerc. 2004;5(2):153-67.	X		Quantitative methodology



### Appendix III: Characteristics of included studies

Authors/ Year	Methods for data collection & analysis	Phenomenon of interest	Setting/Context/ Culture	Participating in structured exercise or a wellness program?	Clients' Participant characteristics & sample size	Providers' Participant characteristics & sample size	Description of main results
Abed <sup>33</sup> 2010	Qualitative descriptive approach using semi- structured audiotape recorded interviews. Data analysis with thematic analysis.	Factors that affect lifestyle choices of people with schizophrenia related to diet and physical activity	Community dwelling persons living with schizophrenia in Derbyshire, UK.	No	Seven people diagnosed with schizophrenia. Age range from 28-59, years with schizophrenia range from 2- 21 years. All were smokers.	N/A	Four main negative factors that contributes to the lifestyle includes: lack of motivation, psychotic symptoms, lack of knowledge of health-related issues and side- effects of medications.
Aschbrenner <sup>34</sup> 2015	Qualitative descriptive approach with face-to- face, semi- structured audiotape recorded interviews. Thematic data analysis.	Perspectives of personal fitness trainers' serving as health mentors.	Five community mental health agencies (one in Massachusetts and four in New Hampshire, USA).	Yes In SHAPE health promotion program (Health clubs operates multiple locations across California)	N/A	Ten full-time health mentors with one to five years of experience delivering the In SHAPE program. Four with prior experience working in the mental health field and eight	The fitness trainers reported that most participants in the healthy lifestyle program had relatives or significant others who influenced their health behaviors by providing emotional, practical and

						with prior exercise trainers.	mutual support, and modelling of healthy behaviors. They believe that providing knowledge and improving communication could facilitate the ability of participants to achieve their health behavior goals.
Browne <sup>13</sup> 2016	Qualitative descriptive methodology using focus groups. Transcripts were entered and coded using Atlas.ti qualitative analysis software. Constant comparison analysis using both deductive and emerging inductive codes.	Client and clinician perspectives on exercise, exercise intervention and associated barriers in individuals with SMI and the potential for a walking group intervention.	Outpatient clinics in two cities in a U.S. Southeastern state that serves individuals with SMI	No	Participants in client focus groups (n = 12) diagnosis of SMI (schizophrenia spectrum, bipolar disorder, major depression); Gender, male 7 (58.3%); Age, male average 39.7 (range 25-50); Race African-American 7 (58.3%); Education, college	Participants in clinician focus groups (n = 14), Gender, female 9 (64.2%); Age, male average 37.3 (range 24-55); Race, Caucasian 10 (90.9%) with higher than college 13 (92.9%).	Individuals with SMI recognize the physical and psychological health benefits associated with walking but experience barriers (Motivations and physical health conditions) that impede participation. Incentives to walk include group walk, pedometers and rewards. Clinicians viewed walking as the most accessible

					degree 4 (33.3%).		and favorable form of exercise. Clinicians viewed clients as inactive and walking as a means of transportation to and from the clinic. Clinicians viewed similar barriers (physical health, motivation and safety).
Chen <sup>35</sup> 2017	Descriptive qualitative study. Five focus groups with 7-8 people in each group. Funnel-based unstructured interviews. Used ATLAS.ti version 7.0 to organize data. Thematic analysis.	Major facilitators and barriers to physical activity participation in SMI.	Two hospital-based and three community-based mental health centers in Taiwan. Mandarin or Taiwanese speaking.	No	Thirty-nine SMI participants: 31 (79.5%) from community mental health centers and 8 (20.5%) from hospital day wards. 20 (51.3%) were female. Average age of 42 ± 11 years. The main diagnosis was schizophrenia (n =33; 84.6%), followed by	N/A	The current study found five facilitators (Motivation by the health benefits of physical activity, engagement in preferred types of activity, support from family and friends, encouragement from health professionals, convenient access to exercise equipment and physical activity facilities) and five barriers (poor health, low self-efficacy, low



					major depressive disorder (n = 3; 7.7%) and bipolar (n = 3; 7.7%).		support from family and friends, fear of negative societal attitudes toward mental illness and unsupportive physical environment) to physical activity participation that were categorized across the personal, social environment, and physical environment levels.
Cullen <sup>36</sup> 2015	Exploratory qualitative descriptive design using semi-structured audio-tape recorded interviews.  Newell and Burnard's framework for thematic analysis used.	The views and opinions of people diagnosed with serious mental illness in relation to physical activity.	Outpatient Community mental health center and day center in Ireland.	Yes  Physical activity is a components of the day treatment program.	Ten participants from outpatient day center. Majority were Irish (90%), mean age 44 years (range 26-60). 6 (60%) male	N/A	The key findings of the study demonstrated physical activity to be a purposeful and enriching activity providing benefits for participants in terms of physical and mental health including social inclusion and engagement, which can enhance quality of

							life and recovery.
Danielsson <sup>37</sup> 2016	Inductive qualitative content analysis using audio recorded semi-structured interviews.	Physical therapy exercise intervention, as experienced by people with major depression.	Individuals diagnosed with major depression and participating in a structured exercise intervention at a Swedish primary care rehabilitation center.	Yes  Person center exercise developed from two individual sessions with physical therapists and aerobic exercise twice weekly.	Thirteen participants. Median age 37 (range 24-62); Female 11 (84.6%); Single 7 (53.8%); Full-time work 4(30.7%) and part-time work 3 (23%). Depression severity before intervention median 23 (range 2-28) as measured by Montgomery-Asberg Depression Rating Scale (MADRS).	N/A	Four categories emerged: Struggling toward a healthy self, challenging the resistance, feeling alive but not euphoric, and needing someone to be there for you. Participants experienced that although the exercise intervention was hard work, it enhanced the feeling of being alive and made them feel that they were doing something good for themselves. These feelings were a welcome contrast to the numbness and stagnation they experienced during depression.
Graham <sup>38</sup>	Qualitative exploratory	Explore the meaning of a	Psycho-social rehabilitation	No	Twenty-three individuals (14	N/A	Participants perceived a

2013	study using focus group. Thematic data analysis.	healthy lifestyle for the SMI and the barriers they experience to healthy living.	program in Northern British Columbia, Canada.		females and 9 males), over 18 years of age (range 21 - 64 years average age 44 years) living with serious mental illness.		healthy lifestyle in broader terms than professional guidelines for exercise and diet. This broad framework included friendship, affordable safe housing, employment, spiritual, and emotional good health, as well as healthy eating and exercise. Barriers identified by participants were poor mental and physical health and stigma (structural, social, and self). An unexpected result was the group problem solving that occurred during the focus groups.
Happell <sup>39</sup> 2012	Qualitative exploratory study using six focus groups.	Explore nurse views on the value of physical	Both inpatient and community services in a remote district of	No	N/A	38 nurses participated in one of six focus groups.	Holism emerged as the main theme from analysis of focus group

	Audio-recorded semi-structured interviews. Thematic data analysis.	activity in the physical health care of people with serious mental illness who are receiving mental health care services.	Australia.			Eleven of the nurse participants reported working in community mental health services, while 17 in the acute inpatient setting, two provided care in both acute and community mental health settings and the remaining six were involved in 'other' forms of care, such as nurse practitioner.	interviews, and physical activity was integral to their holistic view (e.g. as important to physical and mental health).
Hargreaves <sup>40</sup> 2017	Interpretive hermeneutic phenomenology using open-ended semi-structured funneled interviews. Used	Explore individual lived experiences of physical activity to elucidate the behavior change processes of	SMI in recovery in a community psychiatric trust in the United Kingdom.	No	Eight active participants with serious mental illness in recovery with either bipolar disorder or schizophrenia	N/A	One of the novel findings of the current study was that acknowledging the body in existence is central to enabling PA to commence in the

	qualitative data analysis software, NVivo (version 8) to organize data. Thematic data analysis using King's template analysis.	physical activity in people with SMI who are in recovery.			(4 male, and 4 female). Age range 21 - 58). 62.5% engaged in one form of work.		first instance. Without an awareness of the body in existence PA is not deemed possible as participants were consumed by their mind. The environment was also central to engaging people in PA. This includes physical and social space as well as the individual's relationship with the environment.
Jimenez <sup>41</sup> 2015	Qualitative exploratory study using semi-structured audio-recorded, funneled structured interviews. Used NVivo qualitative software program to organize the	Identify facilitators and barriers to engaging in health behavior change and identify exercise preferences among Latino adults with SMI participating in a health	English and Spanish speaking Latinos residing in a metropolitan community in the United States.	Yes,  In SHAPE health promotion program	20 Latinos, 11 men and 9 women age range 22 to 54 with diagnosis of major depression, bipolar disorder or schizoaffective disorder or schizophrenia with a body mass index (BMI) greater	N/A	The primary facilitator identified by participants was having someone (either professional or significant other) to hold them accountable for engaging in healthy behaviors. A major barrier to making lasting health behavior change was

	data. Thematic analysis.	promotion intervention.			than 25. Seventeen participants were single, ten living independently.		cultural influences on food. Participants preferred aerobic exercises set to music that kept their minds occupied in contrast to strenuous activities such as weight lifting.
Johnstone <sup>42</sup> 2009	Qualitative explorative study using digital-recorded semi-structured interviews and interpretive phenomenological data analysis.	Investigate barriers to physical activity uptake in community-based patients in Edinburgh.	Community-based schizophrenic patients in Edinburgh, United Kingdom.	No	Twenty-seven participants age range 27–64 years with diagnosis of schizophrenia for a minimum of one year, receiving antipsychotic medication and stable mentally at time of study. males 16 (59%), and single 19 (70%).	N/A	Four barriers to physical activity uptake were identified: limited experience of physical activity engagement, impact of the illness and effects of medication, effects of anxiety and the influences of support networks.
Lassenius <sup>43</sup> 2013	Qualitative descriptive study audio-	The meanings of lived experiences of	Persons living in residential psychiatric	No	Fourteen persons (nine men and five	N/A	Five themes emerged: Capability for

	recorded interview using interpretive phenomenological-hermeneutical data analysis.	being physically active in persons with psychiatric disabilities.	setting or participating in the daily activities provided by community centers for persons with psychiatric disabilities in Sweden and Swedish speaking.		women) participated in the study. Ages ranged from 27 to 59 years (mean = 47 years). Nine persons lived in residential settings, five persons lived independently		living, liberation from a heavy mind, companionship in being in motion, longing for living one's life and struggling with limitations. The interpreted meaning of being physically active was to be moving toward reclaiming one's life.
McDevitt <sup>44</sup> 2006	Qualitative exploratory study using audio-taped focus group semi-structured interviews. QSR NUD*IST N6 qualitative software supported coding of data Thematic analysis	Explore perceived barriers and benefits to physical activity  in outpatients with SPMI who are undergoing community based psychiatric rehabilitation.	Two community-based psychiatric rehabilitation centers in a large urban area in the midwestern part of the United States.	No	34 participants. 18 women, age range (18–50) from two study sites, 24 were African American, 7 were White, and 3 were Hispanic or of unknown ethnicity.	N/A	Significant barriers to physical activity were: mental illness symptoms, medications, weight gain from medications, fear of discrimination, and safety concerns.
Rastad <sup>45</sup> 2014	Qualitative explorative audio-recorded	Perception of barriers to and incentives for	Three psychiatric outpatient clinics	No	20 informants 13(65%) were men, 19	N/A	Majority of the informants reported positive

	semi-structured interviews analyzed with qualitative content analysis.	physical activity in daily living in patients with schizophrenia as reported by the patients themselves.	in three mid-sized towns in Sweden.		diagnosed with schizophrenia, median age range (22-63) and 17 single civil status.		feelings toward physical activity that could be used to reduce symptoms, however, key barriers related to schizophrenia symptoms, such as feeling mentally unwell, having difficulties initiating activities, or hearing voices with a negative attitude toward physical activity...prevented physical activities.
Shiner <sup>46</sup> 2008	Qualitative descriptive study using appreciative inquiry (AI). Semi-structured audio-taped interviews. Thematic analysis.	Elements of an individualized health-promotion program that persons with SMI perceived to be most influential in helping them achieve physical health	Community mental health Center in New Hampshire, United States.	Yes  In SHAPE health promotion program	Eight participants: three with chronic major depression, two with bipolar disorder and three with a schizophrenia-spectrum disorder; five men. Mean participant	N/A	Three themes emerged, highlighting the importance of: (i) individualized interventions promoting engagement in the program; (ii) relationships with health-promotion program employees and (iii) self-confidence



		improvements.			age 43.0 (+15.3) years. All Caucasian; five participants were living independently, two were living with their families and one was living in a supported setting.		resulting from program participation.
Shor <sup>47</sup> 2013	Qualitative descriptive study using open-ended semi-structured audio-taped interviews. Themes identified using a grounded theory approach	Subjective perception of participants with severe mental illness of the barriers to advance their wellness.	Community residential mental health facilities in Israel offering health promotion groups to persons with mental illness.	Yes  Health promotion program.	Eighty-four persons. Mean age 36.2 (SD = 16.061), age range was 19-69, men (51%), high school graduate (46%) and single or divorced (86%).	N/A	The barriers may include the side effects of medications and/or the results of lack of companionship. In addition, organizational and broader systemic barriers, such as organizational culture and policies that do not support the advancement of wellness, may contribute to an accumulation of barriers.

Sims-Gould <sup>48</sup> 2017	Community based participatory qualitative study one-on-one audio-recorded interviews. NVivo 10 coding software was used to organize codes. Codes grouped into themes.	Understanding of the barriers and facilitators to physical activity for individuals with a mood disorder.	English-speaking community dwellers in Lower-mainland, British Columbia.	No	Twenty-four participants: 66.6% (n=16) female average age 52 years with Major Depressive Disorders (N=18) or Bipolar II depression (N=6);	N/A	The individuals in this study felt that the key features of a physical activity program for individuals with a mood disorder must utilize a social network approach, to account for the preferences of potential participants, and incorporate nature (both green and blue spaces) as a health promotion resource.
Wright <sup>49</sup> 2012	Qualitative interpretive phenomenological approach using semi-structured audio-recorded interviews.	The personal experiences of the relationship between exercise and Bipolar Disorders.	Community dwelling in the United Kingdom.  English proficiency.	No	Twenty-five individuals with diagnosis of Bipolar Disorders. Participants with BD-I (21), with BD-II (3) and other Bipolar Disorders (1); The mean age was 51 (age range 24–71). Ten of the	N/A	Identified three themes that seem particularly pertinent to Bipolar Disorder that seem to capture important aspects of our participants' experiences of exercise: exercise regulation, exercise as a double-edged sword, and

					participants were male.		exercise bringing structure to chaos.
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#### Appendix IV: Findings and illustrations

Abed H. What factors affect the lifestyle choices of people with schizophrenia? Ment Health Rev. 2010;15(2):21-7.	
Finding 1	A general but profound lack of motivation prevented many from exercising. (U)
Illustration	'I just can't get anything done. I can't get motivated to do anything like housework or even going walking outside, I don't want to do it sometimes.' p. 23
Finding 2	A general but profound lack of motivation made it difficult to go shopping and to plan and prepare healthy meals. (U)
Illustration	'The other thing that's stopping me from buying more food is lack of motivation. It takes you about an hour to cook and eat a meal doesn't it really. You know, something substantial like meat and two veg. It just gets too much. I like to just have things that are easy and simple even though it gets boring.' p. 23
Finding 3	Auditory hallucinations were a factor preventing cooking of healthy meals (U)
Illustration	'I've ended up burning stuff and letting pans boil dry because I've got all this going on in my ears and I'm not paying attention to what I'm doing. I can't concentrate on the food when I've got these voices in my ears.' p. 23
Finding 4	Psychotic symptoms made participants afraid to leave the house. (C)
Illustration	Those participants who were troubled by paranoid or persecutory thoughts were often afraid to leave the house, often avoided more crowded places such as supermarkets and gyms. p. 23
Finding 5	Lack of knowledge as to higher risk of developing type 2 diabetes. (U)
Illustration	Question: 'Do you know of any relationship between your illness or your medication and diabetes?' Answer: 'No not at all.' p. 24
Finding 6	Medications made them feel tired or sleepy and this interfered with their ability to function during the day, and made engaging in physical activity difficult. (U)
Illustration	'Well I can get myself motivated, I can gear myself up, but it's like fighting a losing battle with the medication. It just drains you, it tires you out.' p. 24
Finding 7	Subjects felt medications made them gain weight (U)
Illustration	'The hunger is hard to describe. It's an overwhelming urge and you can't get it out of your mind until you eat. In the past I've stopped taking my medication for six to eight months and ended up in a psychiatric hospital. I've managed six to eight months without medication and I've gone down to my normal weight in that time.' p. 24
Aschbrenner K, Mueser K, Bartels S, Carpenter-Song E, Pratt S, Barre L, et al. The other 23 hours: a qualitative study of fitness provider perspectives on social support for health promotion for adults with mental illness. Health Soc Work. 2015;40(2):91-9.	
Finding 1	Participants benefited most when family members either modeled healthy

	behaviors or joined them in changing their eating and exercise behaviors. (U)
Illustration	Mentor I have a participant who is trying to lose weight along with her adult children. She has a son with type II diabetes and two other children who are overweight. They were walking together before the In SHAPE program, but now they are really teaming up to make dietary changes to achieve their weight loss goals. p. 94
Finding 2	Unhealthy behaviors of others made it more difficult for participants to make desired changes. (U)
Illustration	Mentor Although the family member knows the participant is in this program, they don't always make the healthiest food choices, especially if they are eating out at fast food restaurants. It's difficult for participants to eat healthy when they're out to dinner with friends who are eating unhealthy. p. 95
Finding 3	Social support could increase participants' motivation to change their health behaviors. (U)
Illustration	Mentor Meaningful relationships are what really help people flourish and thrive, and the people closest to you should be building you up, not bringing you down. If there were a way for us to positively impact participants' close personal relationships to get them on board with the program, we would see In SHAPE participants be that much more successful. p. 95
Finding 4	Educating family members about the In SHAPE program goals and activities was necessary to increase support for it. (U)
Illustration	Mentor I think it gets back to a basic understanding of what it means to change one's diet. What does it mean to eat low fat, and how to change a portion size . . . understanding why it is important to do different types of exercises and see the connection between day-to-day activity and the In SHAPE program. p. 96 It would be helpful for families to understand how mental health symptoms can get in the way of exercising and how psychiatric medications can cause weight gain. p. 96
Finding 5	Social support for health behavior change could be increased by improving family communication skills. (C)
Illustration	Mentor Health mentors suggested that family members would benefit from learning more effective ways to communicate support for participants' health goals and behaviors, including practicing attentive listening, managing stressful interactions, and using emotional awareness during communication with the participants. p. 96
Finding 6	Setting mutual health goals with a family member or significant other could create a natural support system to help participants reach their health goals (U)
Illustration	Mentor When you see a family member or loved one doing the same thing [eating healthy or exercising], you cheerlead for each other, which in turn builds a greater bond, and then you are holding each other accountable for health goals. If participants and family members have a good relationship, then you hope that they'll carry on with the gains they've made once the program has ended. p. 96
Finding 7	Family emotional support in recognizing efforts and celebrating progress encourage pursuit of health goals. (U)

Illustration	Mentor “The way he [husband] complimented her [wife] in front of me, saying, “I’m just so proud of you for sticking with this program, and I’ve really seen improvements in your mood,” was really nice for her to hear, and me. p. 94
Finding 8	Practical support such as transportation and financial support from family was essential for helping participants access fitness facilities and grocery stores. (U)
Illustration	Mentor One of our participants lives with his aunt and uncle who were paying for his gym membership once the grant ended. The participant did well in the program and his aunt noticed his weight loss and healthier eating habits. She offered to continue paying for the membership if he went at least three times per week. That incentive kept him going. p. 94. “I have a participants whose father brings her to the gym whenever she has an appointment”. p. 94.
Danielsson L, Kihlbom B, Rosberg S. "Crawling Out of the Cocoon": Patients' experiences of a physical therapy exercise intervention in the treatment of major depression. Phys Ther. 2016;96(8):1241-50.	
Finding 1	Participants' experiences that the exercise intervention sparks a sense of being capable, as physically active people, in contrast to feeling entrapped in their depressed state. (U)
Illustration	Since I’ve been exercising, like, always . . . then to suddenly not being able to, . . . it’s like you don’t really know who you are. So it’s this thing about trying to find myself again, I think. p. 1245.
Finding 2	Exercise helped to start crawling out of depression’s “cocoon”. (U)
Illustration	On some level, the exercise Jump-Starts my body. . . . How can I explain? . . . It kind of helps to rip open the cocoon you’re in. It helps me to get the strength to crawl out of it, in a way. p. 1245.
Finding 3	It is not the wanting to do things that is failing, it is the ability to carry them out. (U)
Illustration	Right now, when I’m feeling low, it’s hard, even though people say, “Pull yourself together and just go to the gym. It’s not that hard. Get off your lazy ass.” But if you’ve tried to get off your lazy ass for 6 months, then you just can’t anymore. Doesn’t matter how much people nag you p. 1245.
Finding 4	Even though resistance can be a paramount feeling, the participants said that the concreteness of challenging their bodies in strenuous movements provided a feeling of actually carrying something out. (U)
Illustration	At first, I feel very slow; it takes a while before I get into. . .before I feel any drive at all. I feel like, no, I don’t want to do this. I can’t be bothered. I don’t have trust that my body has the strength. Really, it’s an enormous slowness. But then you get up, you get going, and the body wakes up. I feel good; when I move, I feel much better, I’m doing something that feels great, carrying it out p. 1247.
Finding 5	Participants described a change of increased alertness, softness, mobility, and energy. (U)
Illustration	I notice that my body softens and that I feel more alive in my body, more in contact with my body. If I’m just sitting like this, I don’t really feel my body in the same way; it’s more uncomfortable. But when I start to move, I kind of turn more alert, happy, and strong in a way p.1247. I walk differently, there’s more energy to it. It’s not just about fitness and stamina, but more about how I feel, like the energy inside.

	Because it was totally gone. p.1247.
Finding 6	Feeling more alive but not euphoric; To sense the vigorous, moving body in exercise felt great. (U)
Illustration	I'm really happy with my body, it's like I have a solid foundation, my body responds much quicker than my mind. . . . I have problems with some parts, my inner organs, . . . but my muscles and my skeleton. . .they feel great. . .the very shell of me. . .so great to really sense them. p.1247.
Finding 7	However, some participants were disappointed that exercise did not bring about the strong, euphoric sensations that they had expected. (U)
Illustration	To be honest, I was hoping to feel some moments of euphoria, but there was nothing like that. p.1247. I get absolutely no kick out of exercising! It does nothing for me! Those chemicals, I just have to assume that they're not being released! p.1247.
Finding 8	The physical therapist is an important ally, as a supportive person "setting the pace" and increasing their motivation both by being attentive and by suggesting strategies to come around barriers such as pain. (U)
Illustration	It's not so much that you exercise really hard and perform perfectly. It's rather about the feeling that you're on the way. It doesn't have to be so much, . . . and it helps you, if you're with a PT [physical therapist], it helps you to think not so much about exercise as competition. p.1248.
Finding 9	Participants appreciated training in a group with others who share the same problems. Just knowing that others might feel similar is a nice feeling, according to another participant. (C)
Illustration	Feels great to be in a group here. . . . I don't really know who the others are or what problems they have, but it's easy to imagine that they are like me, think the same way I do, and they don't mind me doing things my way. We're just like everybody else. They wondered where I was if I didn't show up. Sometimes they asked, "Where is she, how is she?" Someone actually cares, and you come here, and you become someone who is cared about by someone else, and that feels pretty great p.1248.
Finding 10	Other participants had opposite feelings about being in a group. (U)
Illustration	I absolutely need support from somebody, but I don't like big groups, don't like to be one of many. I don't like the forced social interplay with people just randomly pushed together. p.1248.
Cullen C, McCann E. Exploring the role of physical activity for people diagnosed with serious mental illness in Ireland. J Psychiatr Ment Health Nurs. 2015;22(1):58-64.	
Finding 1	Endorphins and 'the feel good factor' were reported by participants to be an important feature in being physically active as exercising was beneficial for physical and mental well-being. (U)
Illustration	"Physical activity is real important, the endorphins, I used to jog every morning for an hour, you feel so much better after it and you know it was great – it helps mentally and physically . . . you are meeting people and you have great fun" p.61.

Finding 2	Physical activity benefits positive self-esteem and body image. (U)
Illustration	"I was great then doing the aerobics it was so good it made me so energetic . . . I had high self-esteem then because, I had a good figure and my legs were stronger" p.61.
Finding 3	Majority of participants acknowledged the benefits of physical activity as a distraction from mental health issues and in getting them out of the house as a good way to keep their mind occupied from negative thoughts. (U)
Illustration	"Physical activity keeps your mind active – getting out and having something to do, somewhere to go adds structure and routine to the day. It distracts you" p. 61. Physical activity was a useful distraction in dealing with 'voices'. p. 61.
Finding 4	Physical activity helped with social interaction, as exercising as part of a group and walking with people made participants feel included, which assisted with building new friendships and giving them a feeling of connectivity. (C)
Illustration	Some people said that going with friends to the gym or meeting friends there made it easier to participate in exercise...feeling socially connected and 'felt part of something'. p. 61.
Finding 5	Being 'part of Physical activity something' and being involved in a programme added to 'a sense of achievement' and of feeling empowered. (U)
Illustration	Being part of an activity programme improves your quality of life, physically and mentally, it opens up pathways, you feel better about yourself, and you're sharper mentally p. 62.
Finding 6	Participants found that regular physical activity such as walking and structured exercise programmes, aerobic classes and gym work such as weights and exercise bikes improved their daily life. (U)
Illustration	Physical activity enhances your enjoyment in life you feel part of something and you know that your important p. 62.
Finding 7	The importance of trained gym instructors and nursing staff to support them in participating in physical activities. (U)
Illustration	Support and encouragement is a huge factor in me being physically active and if I didn't have supportive nursing staff that could be a barrier p. 62.
Finding 8	Not having a familiar and safe environment to exercise was a barrier, as exercising outside caused him anxiety and fear. (U)
Illustration	I would feel very worried about going out – I just have to force myself out . . . coming to the centre helps, as I know it is a familiar place and staff p. 62.
Chen MD, Kuo YH, Chang YC, Hsu ST, Kuo CC, Chang JJ. Influences of aerobic dance on cognitive performance in adults with schizophrenia. Occup Ther Int. 2016;23(4):346-56.	
Finding 1	Most participants felt exercise could improve health (e.g., helping to lose weight and reducing physical symptoms of pain and discomfort) and promote mental health (e.g., improving sleep and regulating moods). (U)
Illustration	"In addition to preventing you from getting fat, exercise can lower your odds of getting some diseases. When you lose weight, you will not have some diseases



	related to overweight and obesity". p. 102 "It's just when you regularly do exercise everyday, ....when you've done some exercise, you have a sense of achievement. It lifts your mood afterwards". p. 102
Finding 2	Participants indicated that it is easier to engage in physical activity when the activities were self-chosen or a preferred modality. (U)
Illustration	"I think it depends on what type of activity I can choose - if it's a type of activity that I don't like then I feel tired and don't feel like moving. If it's something that I like, then I feel a lot of interest in it. Sometimes I find that some competitive activities are more interesting" p. 102
Finding 3	Participants agreed that verbal encouragement or accompaniment by friends and family increased their physical activity participation. (U)
Illustration	"Because my father always encourages me to exercise. Without their encouragement I wouldn't feel like doing it" p. 102
Finding 4	Participants found it easier to engage in physical activity when they received encouragement from healthcare professionals. (U)
Illustration	"Although my family would encourage me get more physical activity, I sometime just felt annoyed with what they said. I would rather listen to what the health professionals said" p. 102
Finding 5	Most participants found that it was easier to be active when they had easy access to facilities that enabled activity or had exercise equipment. (U)
Illustration	"If there's a park or a school near my home, then I'm more willing to go out and get some exercise, because it's convenient." p. 103
Finding 6	Participants often indicated that certain physical conditions (i.e., older age, physiological diseases, and psychiatric auditory hallucinations) and side effects of psychiatric medications hindered their physical activity participation. (U)
Illustration	"Because I felt sleepy, I got very tired; because I take medications that make me sleepy." p. 103
Finding 7	Participants indicated that low levels of confidence in engaging in activity limited their physical activity participation and would rather not to perform exercise in order to avoid physical tiredness when and after exercising. (U)
Illustration	"I was interested in tennis. But I am not good at tennis, I was afraid of asking someone to play together" p. 103. "I just felt that I cannot do exercise because I didn't feel confident on my physical stamina and was concerned about the exercise injury due to the poor skills and ability". p. 103.
Finding 8	Lack of support from peers and family became a factor that limited physical activity participation. (U)
Illustration	"But if no one takes me, I feel like I'm doing alone .... it's just boring!" p.103. "I have no friends so I don't want to go doing exercise!". p.103.
Finding 9	Participants indicated they reduced the amount of outdoor physical activities they engaged in because they were worried about unfriendly looks from others and feared being recognized by acquaintances. (U)

Illustration	"If I want to go out jogging I'm afraid of running into acquaintances or my teachers. Because taking psychiatric drugs makes me drag my feet, my footsteps get slower, I'm afraid that other people will find out and wonder if I'm sick." p.104
Finding 10	An unsupportive physical environment, including inclement weather (e.g., rain, too hot, cold) or poor accessibility to physical activity facilities, was also identified as a barrier to physical activity. (U)
Illustration	"I like playing basketball. The problem is, if there isn't an indoor basketball court and if it's raining, how am I going to play basketball? It affects your state of mind and affects you so you get really lazy." p. 104
Finding 11	Participants often indicated that certain physical conditions (i.e., older age, physiological diseases, and psychiatric auditory hallucinations) and side effects of psychiatric medications hindered their physical activity participation (U)
Illustration	"When I wasn't ill, I could play basketball till exhaustion; afterwards because I got diabetes I got scared of the effects of low blood sugar; low blood sugar made me feel sick, so I did less exercise after that." p. 103
Finding 12	Participants often indicated that certain physical conditions (i.e., older age, physiological diseases, and psychiatric auditory hallucinations) and side effects of psychiatric medications hindered their physical activity participation (U)
Illustration	"Before, because I was disturbed by voices [auditory hallucination], when I was walking I felt an invisible pressure squeezing my body; when I was walking in the park I felt like there was nothing I could do to ease that feeling of oppression." p. 103
Graham C, Griffiths B, Tillotson S, Rollings C. Healthy living? By whose standards? Engaging mental health service recipients to understand their perspectives of, and barriers to, healthy living. Psychiatr Rehabil J. 2013;36(3):215-8.	
Finding 1	Friendship was identified as a major component [to a healthy lifestyle] which allowed acceptance, support, and connection to a community. (U)
Illustration	"It really helps to know that you are wanted, you're needed . . . that somebody cares about you." p.216.
Finding 2	Housing was identified as significant to being able to live healthily, with sleep and stress being affected by poor housing. (U)
Illustration	"We have lots of people at the center that are living in unsafe places and they don't get sleep. They're afraid to go to sleep and as a result your mental health is suffering and so is your physical health." p.216.
Finding 3	Having work either volunteer or paid was significant to a healthy lifestyle and gave personal value, confidence. (U)
Illustration	"It's part of being healthy to have an opportunity to find a bit of work, that may build your confidence." p.216
Finding 4	Healthy eating and exercise were recognized as part of a healthy lifestyle. (U)
Illustration	"At first I thought it meant healthy food and eating and then I thought no a healthy lifestyle is more than that, it's exercising and eating right and also looking after your

	mental health, medication, sleep, rest.” p.216.
Finding 5	Spiritual and emotional health were identified as important to a healthy lifestyle. (U)
Illustration	“Spiritual health—healthy mentally, emotionally, physically, and spiritually.” p.216
Finding 6	Mental and physical problems interfered with participants’ ability to live healthily. (U)
Illustration	“Sometimes I can’t get out the house because of my nerves and my head thinking it will be too crowded down there. You shouldn’t have to go hungry because you’re having an anxiety-ridden day.” p.216.
Finding 7	Structural stigma leading to exclusion from healthy lifestyle choices was the most frequently referenced barrier across all focus groups. Inadequate social benefits affected participants’ ability to afford healthy food choices, safe housing, social interaction, and transportation to be able to attain food from stores other than local convenience stores. (U)
Illustration	“That hinders all other aspects of having a healthy lifestyle when you have to choose whether you want to eat or if you want to have a safe, affordable place to live, it’s one or the other.” p.216-217.
Finding 8	Participants identified social stigma-lack of understanding from different large social groups (including health care professionals, social agencies, employers, and landlords) as producing barriers to healthy living. (U)
Illustration	“I went on this medication, I was over three hundred pounds, the doctor’s saying ‘well you’re overweight’; well I wasn’t when I started it . . . if I just stopped taking my medication I’d probably lose a lot of weight. So am I going to be fat and sane or skinny and nuts?” p.217
Finding 9	Participants gave narratives describing the internalized negative effects from their experiences, affecting their ability to live healthy lives. (U)
Illustration	“I’m 240 lbs and everyone else is 120 lbs, like I’m going to join this gym group, yeah right!” p.217.
Finding 10	An unexpected result of the focus groups was that participants began to problem solve many barriers. (C)
Illustration	Participants came up with innovative ideas for organizing peer support around cooking, food preparation, shopping, and exercise to help with motivation. p.217
Finding 11	Mental and physical problems interfered with participants’ ability to live healthily. (U)
Illustration	“Having the energy to function is difficult . . . being on these meds saps your energy.” p.216
Hargreaves J, Lucock M, Rodriguez A. From inactivity to becoming physically active: the experiences of behaviour change in people with serious mental illness. Ment Health Phys Act. 2017;13:83-93.	
Finding 1	Not ready to engage in physical activity; when they perceived their illness to be at its most severe, the needs of the body were neglected... it was as though they were completely consumed in their mind, they were living and existing in their

	minds and their bodies were left desolate, rendering PA impossible. (U)
Illustration	"I think I've touched base with all the points of the extremes of it [illness] to the point where I've just let my body ... I've been so wrapped up in my mind that I didn't clean my teeth for a year, didn't wash, just let everything go, I was totally consumed in my mind" p. 86.
Finding 2	PA was driven by the embodied urge to free themselves of some of their perceived negative symptoms and lethargy associated with the medications. (U)
Illustration	"I just seem to like be getting drove mad [by the voices and depression] and it drove me to do exercise ... but it's [PA] definitely not something that has been pushed it's more what hearing the voices has pushed me to do' p. 87.
Finding 3	No matter what the motivation was to be active, this was not sufficient without a PA enabling environment. This included supportive staff, the availability of equipment, safe environment and an opportunity to be active. (U)
Illustration	If you've got someone there that's come on I'll meet you there you know like Sam did, Sam said I'll meet you just get yourself to centre, the first couple of times I was absolutely terrified because I was getting myself down on me own and I was frightened but soon as I got here with Sam, Sam did the class with me and made sure I were Alright. p. 87
Finding 4	Participants at any stages of the illness, some form of pre-exercise routine appeared to take place. (U)
Illustration	"The voice tells you to flick from one sound to another and then eventually after doing that you've got to submerge yourself into all the sounds ... when I played football on Saturday I did the tape before playing so that I started to feel more in the natural world ... it stops that being detached from what's going on, it stops your mind from wandering and it focuses you and on what you're doing" p. 88.
Finding 5	When participants began to recover and experience PA, they described how they began to engage in a real and physical space, which is in contrast to the 'murky hole'. (U)
Illustration	"There's that unreal feeling that you can have when you're poorly, when you're anxious and sport pops that anxiety bubble a little, certainly for that moment when you're doing it and that while after and if you keep doing it, it does pop that anxiety bubble a little bit and things that have looked unreal and flat and maybe a bit darker, become more 3D and more colourful" p. 88.
Finding 6	PA helped them to develop an identity in which they felt 'normal'; for some participants, this was the recognition of a former sporting self, for others it was a recognition of a self without the entrapments of mental illness. In both circumstances, it appeared to help settle the troubled relations in mind and self. (U)
Illustration	I'm actually saying hello to those people in the street, or instead of feeling really shy and anxious and put my head down, I'm actually looking at them or, been cued into how people work so if you notice that they're not looking at you look away p. 88.
Finding 7	Doing PA as therapy; participants described how they purposively used PA as part of their therapy and recovery. However, this was something which they had chosen

	to do and was not necessarily on their care plan. (U)
Illustration	PA was recognised as important to maintaining and improving their self and coping with their illness, and was something which they hoped to maintain throughout their life. p. 89.
Finding 8	A release of stress appeared to be reinforced by the visual and actual felt sensation of sweat and its associated heat. (U)
Illustration	"It's a release of all the negative stuff that I'm thinking ... because I do it, and as I'm going along on the treadmill ... you get hot don't you because you're exercising, you're body's working and it releases those chemicals ... and I just think to myself ahhhhhh [relaxing sound], it's like a stress release" p. 89.
Finding 9	Variety of PA was described which helped individuals distract them from their voices. This included setting goals such as the amount of time on an exercise machine (Ann, Tina), learning a new skill or conducting intense and stimulating PA. (U)
Illustration	"A voice I would be having a bad time with my head but when I was walking and out in nature things calmed down ... the rhythm of walking it's .... my mind was racing at 100 miles per hour where's walking slowed things down, took time to look around see what was going on in nature, took the smallest details watching the bees collecting pollen and things you just get lost in the moment" p. 90.
Finding 10	Participants purposively chose low intensity PA as it provided them with the time and space to work through thoughts (U)
Illustration	"I got in the house and I thought I just want to go to bed ... then I actually got on the treadmill ... I just thought I've had enough I get to the stage where I'm exhausted ... so it's either go to bed or get on the treadmill, so I got on treadmill ... and I'm walking away on treadmill when you start thinking about things and I stood there and I thought 'why did I get myself into such a state it's only a car, you know it can be fixed and so what if you know it's there and they just decided to cause you loads of problems' ...and I just thought 'why, why did I get myself into a state, nobody else is bothered, and after I'd done it I felt quite alright and I weren't upset no more" p.89
Finding 11	No matter what the motivation was to be active, this was not sufficient without a PA enabling environment. This included supportive staff, the availability of equipment, safe environment and an opportunity to be active (U)
Illustration	"I were doing some press-ups actually in hospital and they said you can stop them, you're here to rest, so I stopped doing that and rested up and it just made me worse ... just sinking back into chair ... I was getting depressed, I went really lethargic and I didn't like it one bit" p. 87
Johnstone R, Nicol K, Donaghy M, Lawrie S. Barriers to uptake of physical activity in community-based patients with schizophrenia. J Ment Health. 2009;18(6):523-32.	
Finding 1	Impact of the illness and effects of the medications reduce participant's self-esteem and confidence to participate in physical activities. (U)
Illustration	"Because it's a tremor which happens, it can happen on a bus, it makes me feel very self-conscious. So that is, but if I feel shaky in the morning before I go out I

	might delay it.” p. 527.
Finding 2	Social anxiety including panic attacks and social avoidance emerged as the most prominent barrier [to physical activities]. (U)
Illustration	“The thing that stops me is the voices. Sometimes if I’m in the street I get paranoid that people are watching me and looking at me.” p. 527 “Walking groups means two things – one is the other people in the group being around and also being somewhere I don’t know well.” p. 527.
Finding 3	Support networks provide the structure, encouragement and purpose that many needed. (U)
Illustration	“Once I get that routine sort of thing, it’s not too bad really. The team (Mental Health Team) push a wee bit because they know I dread going out.” p. 527. “I do relaxations stuff here (Community mental health unit) because it’s a lot easier to do it in a group. It focuses your brain and you get courage from everyone else in the group.” p. 527.
Finding 4	Impact of the illness and effects of the medications reduce participant’s self-esteem and confidence to participate in physical activities. (U)
Illustration	“Now when I go to the pool I do one length and I’m “oh, I can’t do this”, I’ve no confidence in myself or motivation to go out and do 20 lengths of the Commonwealth Pool, I used to do that 10 years ago.” p. 527
Happell B, Scott D, Platania-Phung C, Nankivell J. Nurses’ views on physical activity for people with serious mental illness. Ment Health Phys Act. 2012;5(1):4-12.	
Finding 1	Geographic barriers to physical activity were of an environmental kind: long distances involved in rural and remote areas, the climate of the region, and the availability of facilities for physical activities. (C)
Illustration	Providers’ perspective: I think they’ve found it hard in winter to get people motivated early in the morning. Even 10 o’clock’s a bit early for them. So - because it has been colder than usual for us up here.’ p.7
Finding 2	A lot of consumers having no money, and living in poverty and resource shortages. (C)
Illustration	Providers’ perspective: ‘...they can’t access these facilities. And coming into Rocky is not always an option because it’s too far to drive. They don’t have the money, things like that. So - or may not even have a car.’ (Community nurse, focus group 2) p. 8
Finding 3	Physical health problems and associated discomfort was also seen as a barrier for some consumers. (C)
Illustration	Providers’ perspective: ‘It’s difficult, so - because he’s not in a lot of pain, but it’s - its discomfort and we believe it’s actually affecting his mental state because he’s - you know, can’t exercise, he’s - as I say he’s in so much discomfort all the time. So - yeah it is affecting his long-term health.’p. 8.
Finding 4	The reluctance of some health professionals to see consumers [mental health patients] for physical health issues when requested by nurses was attributed to

	stigma by some and pessimism about change. (C)
Illustration	Providers' perspective: 'I think there's that stigma that - I think it would be wonderful if we could have our own dietician, diabetic educator and exercise physiologist.' p. 8.
Finding 5	Efforts by staff to support consumers in lifestyle changes despite what they perceived as low motivation in consumers. (C)
Illustration	Providers' perspective: '...part of their symptomatology is that it is very difficult to motivate them and get them to exercise, and you can talk till you're blue in the face and sometimes they just won't engage with it. I mean, we have had walking groups and swimming groups and you might get four or five people go despite, case managers wanting to pick them up and take them home It's just really, really hard. Case managers work really hard to try and work with the clients; to encourage a healthy lifestyle.' p. 8.
Jimenez DE, Aschbrenner K, Burrows K, Pratt SI, Alegria M, Bartels SJ. Perspectives of overweight Latinos with serious mental illness on barriers and facilitators to health behavior change. J Lat Psychol. 2015;3(1):11-22.	
Finding 1	Preventing negative health consequences motivated participants to make positive changes in health behaviors. (C)
Illustration	"It seems there's a lot of health issues with family and that plays a part in wanting to exercise and lose weight because I'm at severe risk of getting all these things." p. 5.
Finding 2	Participants reported feeling motivated to engage in health behavior change when they received positive reinforcement through clear indicators of progress (i.e., weight loss, fitting in old clothes), and praise and encouragement from family members or friends for specific health behaviors and outcomes. (U)
Illustration	"The scale. It just keeps dropping weight, dropping weight. I weighed 260 when I first started. Now I think I weigh 236." p.6 "She's always saying, 'Oh, you look great! You've been doing so well. I'm so proud of you!' She's really happy that I've been able to take off weight." p.6
Finding 3	The primary facilitator identified by participants was having a support and accountability system in place for engaging in healthy behaviors. (U)
Illustration	"We'll call each other early in the morning. He'll ask, 'Did you go to the gym?' If I say no, he'll say, 'I'm disappointed at you.' But you see, that's all we got, is this friendship. We have nothing, so we make the best of nothing." p.6
Finding 4	The social environment may undermined their goals of maintaining a healthy lifestyle. (U)
Illustration	"I don't really like eating at their [his parents] house because their portion sizes are so big. They tend to make bigger portions than I am used to. When I eat over at their house, I tend to gain more weight. They have a lot of potatoes and starches." p. 7.
Finding 5	A major barrier to changing eating habits was the "traditional" Latino diet including a reliance on rice, meat, and "few vegetables." (C)

Illustration	"Greasy, Hispanic foods, they eat a lot of different food. They're all fried. They taste good and everything but they clog up your veins, clog up your arteries." p. 7.
Finding 6	Being on a fixed income made finances a barrier to making lasting healthy behavior changes. (C)
Illustration	"To have a diet is not easy. Things are very expensive. That's something that stands in my way from getting the good nutrition, from buying nutritious stuff. I don't got the income to do it. Maybe if I had more access to things like fish, had the money to buy fish, to buy my vegetables, fresh fruit; I don't got that. That's the one thing that stops me from getting a diet or sticking to a diet." p. 7.
Finding 7	Most participants exercise outside of the gym [despite free membership through In SHAPE] and preferred non-vigorous aerobic exercises (e.g. dancing, walking) set to music that kept their "minds" occupied in contrast to strenuous activities such as spinning or weight and resistance training. (C)
Illustration	"If, for example, I don't want to go to the gym because I am tired or I don't want to leave the house, ok, I don't go. But then, I do something in the house. I turn the music on. I put on my merengue, and I start to dance. I dance as a form of exercise." p. 8-9.
Browne J, Mihas P, Penn DL. Focus on exercise: client and clinician perspectives on exercise in individuals with serious mental illness. Community Ment Health J. 2016;52(4):387-94.	
Finding 1	Clinicians described their clients as generally inactive except for some that used walking as a form of transportation. (C)
Illustration	Clinician's perspective Some [exercise]. Mostly walking, and then most of our clients don't have transportation, so that is one of the main means of getting around, so they do walk. p. 390
Finding 2	Clinicians believed their clients were aware of the physical health benefits of exercise but rarely engaged in it due to various barriers. (U)
Illustration	Clinician's There are those that are sort of aware that they're [...] overweight and would like to exercise, but say they're living in a group home, the access to a gym is not really available because they don't have the transportation.
Finding 3	Motivation was the most salient obstacle to exercise. (U)
Illustration	Client I have a lot of trouble especially lately motivating myself to exercise, I struggle with depression. Its one of the hardest things is to get yourself going. Motivation! I have that problem with exercise. I just need motivation, so you know groups like this help me talk [...] and seeing other people making [...] efforts to do better with [their] health and stuff. p. 390
Finding 4	Safety was an obstacle [to exercise] that many clients encountered. (U)
Illustration	Client That's the really hard part about walking, You have to go somewhere safe to walk [and then] you have the extra barrier between you and doing the exercise. p. 390
Finding 5	Clinicians believed that physical health complications, symptoms, and transportation were most salient for their clients. (U)



Illustration	Clinician They have some other health complications but obesity I think is probably their biggest health complication. Pre-diabetes, that kind of thing. And exercise wise: I mean, none. They sit at home, watch TV. I think probably the most exercise, the most activity they get is when they come into appointments. p. 390
Finding 6	Symptoms related to SMI (e.g. negative symptoms in schizophrenia spectrum disorders) are a major barrier for clients to exercise. (U)
Illustration	Clinicians' I think they see exercise as important. I think they knows that it's a component of not just weight management but it is a component of their mental health and health and I think they understand it. But there's this negative symptomatology, sort of the avolitional part [that gets in the way]. p. 390
Finding 7	Clients offered several strategies to increase motivation to exercise. (C)
Illustration	Clinician Clients described that walking with a group of individuals would give them "a sense of shared purpose", which would serve as a strong motivator. Additionally, several clients offered the suggestion for using pedometers to track steps, provide rewards for participating, and have time after the walks to share experiences. p. 391
Finding 8	Clinicians recommended pedometers and rewards as the most effective strategies to incentivize clients to exercise. (U)
Illustration	Clinician You could even split the walking into two groups, have teams, use pedometers or something to compete with some sort of a reward. You could tie the number of steps to some [prize like] movie tickets to build and to add some enticing elements to it. p. 391
Finding 9	Clients were most interested in a walking group because of the social interaction component. (U)
Illustration	Client Another thing is, it's nice to go with other people, to meet people, sometimes when you're dealing with depression and things you get isolated, so to combine exercise with socialization is really good. p. 391
Finding 10	Clinicians' thought a walking group would be effective for their clients because it would provide them with the opportunity for social interaction and then they would experience the secondary gain of improved health. (U)
Illustration	Clinician I know our clients crave contact with someone else going through something like them. It's kind of a great idea if you can promote the expectation that the reward is the social connection, the reward is the health benefit. p. 392
Finding 11	Clients described walking primarily for its positive impact on their mood, physical health benefits, and for enjoyment. (U)
Illustration	Client clients reported having depression and described walking during their "witching hour" as a coping skill. p. 390
Lassenius O, Arman M, Söderlund A, Åkerlind I, Wiklund-Gustin L. Moving toward reclaiming life: lived experiences of being physically active among persons with psychiatric disabilities. Issues Ment Health Nurs. 2013;34(10):739-46.	
Finding 1	Daily life was often experienced as empty, and the capacity for being physically active gave participants the chance to create their own meaningful content in life.

	(U)
Illustration	I think that it feels good because you fill your days and time with something; it is that feeling that makes me feel good. That there is something that I can do. p.742
Finding 2	The experience of mastering something gave self-confidence and rendered it possible for the individual to be more independent. (U)
Illustration	A tremendous feeling of security. I feel pretty confident about myself so that I dare to go out at almost any time at night, all by myself. Yes, it gives you self-confidence. p.742.
Finding 3	Liberation through being physically active release the person from troublesome thoughts. (U)
Illustration	Yes, I think that you need to exhaust the body because you have nerves and tensions. For me, it's like that. That's the reason I can't handle those thoughts, there's anxiety and so on there, but when you exhaust yourself you don't have the energy to bite your nails or whatever you do. p.742.
Finding 4	Respite for recovery involved physical activity as an opportunity to experience curative milieus for healing. (C)
Illustration	Well, you take a shower and then you go into the swimming pool and . . . it is like entering another world. It feels really good. p.742.
Finding 5	Being physically active enables companionship with others. (U)
Illustration	I seem to get better mentally when I exercise. I notice it on the staff. It is like I'm healthy and sound. . . . To manage the contact with the staff, that's what I do, the healthier I get in my mind. I get healthy in my mind through practicing physical activity. p.742.
Finding 6	Being physically active enables companionship as a connection to oneself. (C)
Illustration	They see you when you come in and they say goodbye when you leave. One is not invisible. . . . Yes, and I recognize the difference in myself. Today, I dare. I dare to talk about myself and my problems, which I did not do before. p.742.
Finding 7	Physical activity generated liveliness and energy. (U)
Illustration	I have more energy and I'm more alert. I don't feel shut in anymore. p.743.
Finding 8	To keep dreams alive gives strength to live. (U)
Illustration	I take my brisk walks, by myself. I look at all the flowers and bushes . . . And I have my dreams . . . that I would have a small place in the country where I could do a little gardening and so on. . . . I was interested in gardening before I got ill. We had a little cottage with a little garden where we lived. There I was busy. Then, when I got ill I lost interest. p.743.
Finding 9	Experiences of the body hindered being physically active. (U)
Illustration	I feel stiff. I have cancer, plague, AIDS, tetanus. The muscles are all gone, I don't have the energy for that. Because of . . . because of all the medicines. I have poisoned blood. p.743.

Finding 10	Feeling ashamed of being mentally ill led to withdrawal and passivity and hindered physical Activity. (C)
Illustration	No, not during the years when one felt most awful, then one didn't exercise. One did just want to hide and not be seen. Yes . . . One was ashamed somehow. p.743.
Finding 11	Lack of companionship was experienced when the support from others felt consuming or demanding rather than nurturing. (U)
Illustration	. . . I feel worse when people are nagging on me all the time. I can't handle the stress that entails. If a person says, "Now we should do that" . . . then it just becomes a hurdle. p.743.
Rastad C, Martin C, Asenlof P. Barriers, benefits, and strategies for physical activity in patients with schizophrenia. Phys Ther. 2014;94(10):1467-79	
Finding 1	Feeling mentally unwell with depressive mood and anxiety or panic attacks were commonly mentioned obstacles to physical activity. (U)
Illustration	"Every-thing depends on how I feel. So if there's a day when I'm feeling well, then it's clear that I'll do it that time. But then it falls through if I'm feeling bad the next week." p. 1472. "others" could have opinions about their physical activity (eg, telling them to stay at home, not go for walks, or not get their heart rate up). "Much of it is that the illness, the paranoia, as I imagine it . . . those who are pursuing me . . . want me to stay at home with my mother. And not be out running somewhere else. They are even against me taking this walk on Sunday morning." p. 1472. "Yes, it can be difficult for me to get down to doing something. And then I need someone to give me a push. It might be that I am anxious or something. I get stuck in my thoughts somehow, I can't do something. . . . I brood too much. . . . But it is not always like that." p. 1472.
Finding 2	The immediate negative outcomes of pain reduced physical activity for some of the informants. (U)
Illustration	"Well, I walked about 45 minutes a day, and then my legs hurt so much I had to rest for 2 to 3 days. I think it was because 45 minutes in one go was too much. I have never walked so much before." p. 1473.
Finding 3	Informants were hesitant to initiate regular physical activity in fear of not getting results, which could make them feel dissatisfied with themselves. (U)
Illustration	"If I go on with it without any results, then I'm only going to make myself unhappy because I'm not succeeding, and then I will feel worse and then . . . well, it's like I am protecting myself from feeling bad, as I see it." p. 1473.
Finding 4	Misconceptions about physical activity. (U)
Illustration	"I understand that the little I do actually has no effect. Such short sessions are pointless, so little. They should be long sessions, I'm sure. If you swim, it ought to be a kilometer, but right now I can't swim more than 25 to 30 m." p. 1473-1474. It is too late to exercise after 50 years of age, and you have to lose weight before you can become more physically active. p.1474.
Finding 5	Lack of resources: Informants who were working had a much better financial situation compared with those without a job. (U)

Illustration	<p>“So one big reason I don’t go to gymnast- tics, which is fun, is my financial situation, of course. I immediately run into financial problems; there’s the cost of the season ticket, and then I also need trainers, which cost a thousand kronor.” p. 1474. “Yes, if I had good shoes and my feet didn’t hurt, perhaps I would take up those Sunday walks again. I’m always in so much of a hurry when I’m buying shoes; I have to get it over with as quickly as possible. I don’t feel comfortable doing it. I go to the cheapest shoe store and buy the cheapest shoes, and as quickly as possible.” p. 1474.</p>
Finding 6	<p>Being physically active was related to increased joie de vivre and feelings of happiness and joy. (U)</p>
Illustration	<p>“You feel better afterwards, you feel lighter, your breathing is better. It’s a bit like yoga, like meditation. You feel better quite simply. You kind of fly in here.” p. 1474.</p>
Finding 7	<p>Being physically active reduced feelings of worthlessness related to inactivity. (U)</p>
Illustration	<p>“It (walking) has been good for my self-confidence—to feel that my body endures despite everything.” p. 1474.</p>
Finding 8	<p>Physical activity was related to feelings of freedom and independence. (U)</p>
Illustration	<p>“Just going for a walk gives you an incredible sense of freedom, and you feel good. You feel free when you are walking.” p. 1474. “I actually become more independent . . . that you have a sense of being independent, that you can decide for yourself what you are going to do.” p. 1474.</p>
Finding 9	<p>Being physically active was an important way to increase alertness and was considered a means to achieve more during the day. (U)</p>
Illustration	<p>“I’m more wide awake and everything if I exercise more and eat well. More alert, if you like, and achieve more during the day.” p. 1474.</p>
Finding 10	<p>Physical activity was a means to make life richer and more stimulating as well as something to look forward to. (U)</p>
Illustration	<p>“I think that exercise does you good, and I think that it is fun, too. You look forward to going to the gym and everything. Yes, perhaps the voices disappear then and other such nonsense.” p. 1474- 1475.</p>
Finding 11	<p>Informants stressed the importance of understanding that your health deteriorates if you are obese and physically inactive. (U)</p>
Illustration	<p>“It’s that you begin to understand that your health deteriorates if you are fat. It’s not good to be obese when you’re going on fifty. So it is a warning and self-insight that you want to live longer.” p. 1475.</p>
Finding 12	<p>Making a firm decision before starting was considered important. (U)</p>
Illustration	<p>“I believe I can succeed if I really make a decision. You have to be mentally and spiritually determined. All this about eating healthily and going for power walks . . . it feels like I’m standing there and hesitating a little, I haven’t made the decision yet, that really fundamental decision.” p. 1475.</p>
Finding 13	<p>Informants stressed that it was important to have someone to sharewith and that it was encouraging and helpful to get positive and affirmative response from others.</p>

	(U)
Illustration	"The only thing they need to do, in fact, is that I should have someone to tell when I have done these things. I have been able to tell my mother after I have been to the gym. She doesn't say anything in particular, but it's nice to have someone to tell." p. 1475.
Finding 14	Informants stressed that it was important to have someone to share with and that it was encouraging and helpful to get positive and affirmative response from others. (U)
Illustration	"Breaking patterns from my side. And it was easier to do when you could talk to others in the group. You sort of exchanged 'this is what I did' and 'this is what I think' and 'I think this.'" p. 1475
Shor R, Shalev A. Identifying Barriers to improving the wellness of persons with severe mental illness in community residential mental health facilities. Soc Work Ment Health. 2013;11(4):334-48.	
Finding 1	The impact of psychiatric medications caused difficulties in regulation of the times of the day at which they eat and the quantity of food they eat. (U)
Illustration	"The medications increase my appetite and I have difficulties in maintaining order in my way of eating"; "Because of the medications, I eat without a break even at night"; "I receive an injection of a psychiatric medication which increases my appetite." p. 341.
Finding 2	Psychiatric medications contributed to physical limitations affecting their ability to become involved in any kind of physical activity. (U)
Illustration	Because of the medications, I can barely climb up two stairs or walk to the bus station in order to get to work"; "I feel like a pregnant woman—I tell myself, I will walk to the bus station, I walk a little bit, but it is very difficult for me to walk because of the medications." p. 341.
Finding 3	Co-morbid health problems including overweight and problems with their legs. (U)
Illustration	"I have difficulties getting involved in physical activities because of problems I have with my legs and weakness in my body." p. 341.
Finding 4	Participants noted that due to their mental health situation what they care about is what tastes good and what helps them to feel good, and not if it is healthy. (U)
Illustration	"There is no need to check for fat; what matters is if I enjoy what I eat." p. 342. "During times that I do not feel well, I feel that I deserve to eat. During such times I'm not doing sports activities and I eat a lot of fattening food and in this way I gained 30 pounds." p. 342.
Finding 5	Participants described their mental health situation including lack of energy and emotional availability as barriers to involvement in physical activities during periods of relapse. (U)
Illustration	"I don't have emotional energy during this period and nothing helps. I'm not involved in physical activities"; "Because of my mental health problems, I'm not motivated to do physical activities. I'm preoccupied with thoughts." p. 342.
Finding 6	Lack of companionship supporting a healthier life-style in their community

	residential mental health facility was mentioned as a barrier to healthier eating as well as to involvement in physical activities. (U)
Illustration	She answered that she is alone and there is no one with whom to share the food activity... "I'm not motivated to invest in myself"... "I'm too lazy to prepare healthy food when I'm alone." p. 343.
Finding 7	They [participants] cited that there was a culture of not doing a lot in the facility, and to cope with this lack of activity, food served as a distraction when feeling bored. (U)
Illustration	"I'm not doing a lot of physical activities since all day long I'm in the residential treatment facility"; "I tend to eat a lot since I'm bored in this facility." p. 344.
Finding 8	It was difficult to adhere to the nutrition principles they were being taught if there were no support to do so and others did not do so. (C)
Illustration	They tended to spend their budget on buying food and, generally, food that is considered unhealthy (e.g., falafel, ice cream). p. 344.
Finding 9	Lack of supporting companionship was a barrier to physical activities. (C)
Illustration	Participants rationalized their inability to do so by mentioning various difficulties, including that they do not have companionship for their walks and walking alone is boring for them, and there is no one else who can encourage them to walk. p. 344.
Finding 10	Co-morbid health problems including overweight and problems with their legs. (U)
Illustration	"It is difficult for me to breathe because I'm overweight, therefore, I'm only walking"; "I eat less than I used to in the past, but I'm still overweight since I take 12 pills each day. . . . I would like to feel as free as I used to be before I started taking medications. Then I used to go hiking around the country with my back pack." p. 341.
Sims-Gould J, Vazirian S, Li N, Remick R, Khan K. Jump step - a community based participatory approach to physical activity & mental wellness. BMC Psychiatry. 2017;17(1):319.	
Finding 1	Family and friends gave them the support, encouragement, and practical help around daily tasks so that they could improve their own health. (U)
Illustration	My husband is very supportive. For a long time he was making almost all the meals and stuff like that. But he has a really busy job, and the advantage of [for] me? I can be at my best, or close to. If I could be fully functioning and doing a bunch of stuff that makes his life better too. p. 4.
Finding 2	Getting involved in social activities with other people, as opposed to spending the day by oneself, was a desired way to improve their own health. (U)
Illustration	Q: Do you see that as a part of your treatment, the exercise? A: Oh, yeah, definitely. Definitely helps. Socializing with people. It helps. Q: And you see socialization as part of your treatment, right? A: Yeah, I think socializing is just a part of life. p. 4.
Finding 3	The mood disorder as a formidable barrier in itself creating a vicious cycle. (U)
Illustration	Getting out of bed is hard. I wake up and I feel almost drugged, and it's sort of...pulling myself out of the swamp. It's a comfortable swamp of semi-

	consciousness. So if I can make myself get up, I'm fine. p. 4.
Finding 4	Disruptions to income and lack of financial means to engaging in activity. (U)
Illustration	A: But– 'cause I was really enjoying going to yoga, but I've taken, like, I've paused my membership because I have no income right now. Q: So finances are definitely– A: Finances are a huge stressor at the moment. p. 4.
Finding 5	Not being confined to the home was very important. (U)
Illustration	Q: What do you believe are the most important things you could be doing to improve your mental health? The most important things. So not everything. Just the most important you could do. A: Just trying to get out. Trying to get out every day probably, trying to put some more structure in without overdoing it, like, without committing to too much. p. 4.
Finding 6	Having a routine with expected activities helped them manage their health. (U)
Illustration	Getting up every day and kind of having a little bit of a plan for what I need to accomplish. And also just, like, having a certain built-in structure of my son goes to school. I can't let my own depression, anxiety, mental health issues affect his life. ...I need to make sure that his day is structured, but because I need to do this, it gives me a structure for my day. p. 4.
Finding 7	Nature calmed their nerves. (U)
Illustration	I love nature. We've got– as I say, we have a mountain cabin. I love being up there. ... Breathing room, fresh air, peace and quiet. And then the types of activities outside, things like for me, chopping wood, building projects, handyman type work. Taking care of the boat, those sorts of things I enjoy. p.5.
Finding 8	Connecting with nature increased the likelihood of engaging in physical activity. (U)
Illustration	But also because quite often when I'm in the outdoors I'm being physically active. Like, I'm not just– I'm not being rolled to a park and sat there or something. So it's usually connected with activity. And just– I find it's very serene to the point where something like a cellphone call or something just seems to disrupt the serenity of– yeah, of the moment. p.5.
Finding 9	The importance of being part of a caring community with encouragement as a central tenet. (U)
Illustration	If there was...if I was part of a group, to see that I'm– or giving me encouragement, whether it be people that you're working out with, or an instructor, coach type thing, positive ... positive reinforcement. p.5.
Finding 10	A program specifically for individuals with a mood disorder would have the potential to create a sense of community and sharing with other people who were "in the same boat". (U)
Illustration	To share the place with other people with the same illness like me. Because they don't go ah, they don't [sic] going to judge me. And I am not going to judge them. So we are in the same boat, and we are trying to get the same reach. p.5.
Finding 11	Walking, yoga, swimming, and weight lifting as the most desired exercise options because they were fun, economically feasible, and activities they had done

	previously. (U)
Illustration	Yeah, you can't pigeonhole people into something. Doesn't work. If you try to get somebody who doesn't like working out, working out to try and find out if it's going to improve their mental health, they're going to tell you...why are you making me do this? I don't want to do in the first place. p.5.
Finding 12	Availability of a free or low-cost program would go a long way to ensuring program success. The ideal scenario is that a program would be offered free-of-charge. (U)
Illustration	I mean, if it was set up on a six-month program at a fairly reasonable cost to get me started, something like that. Money is always a barrier, but in my case, it's a— it might be a barrier, but it's not an excuse. p.6.
Wright K, Armstrong T, Taylor A, Dean S. 'It's a double edged sword': a qualitative analysis of the experiences of exercise amongst people with Bipolar Disorder. J Affect Disord. 2012;136(3):634-42.	
Finding 1	Some reported consistently regulating their exercise patterns and unequivocally finding exercise to be a useful tool in symptom management... talked about exercise as a means of extending euthymic periods, but also as a means of reducing the intensity of depressive or hypomanic episodes. (U)
Illustration	"when you're down it can actually lift it [the mood], you know, even just, even just a little bit and that can be enough to just keep things ticking over, and then at the other end [when I'm feeling high]...doing something incredibly sweaty for any period of time, it literally burns off some of the energy". p. 638.
Finding 2	Participants discussed positive and negative effects of exercising when hypomanic or manic. These effects often involved an initial feeling of calm following by an increase in symptoms of mania. (U)
Illustration	"calm down the thoughts", "take you slightly higher"... "it's a double edged sword I think, umm, it's taking you a little bit higher but it's also relaxing you at the same time, which allows you then to come back down again." p. 638.
Finding 3	Some did not consider exercise to be a useful tool for symptom management...This opinion was particularly strong in relation to the impact of exercise upon mania. (U)
Illustration	"like a route March really, powerwalking, you really can't stop yourself, you just have to...it's like pressurised speech it is not good for—you at all...you actually are winding yourself up further." p. 638.
Finding 4	Exercise was viewed as having the potential to be both helpful and harmful at the same time. (U)
Illustration	whilst exercise can "calm down the thoughts", it does also "take you slightly higher". He elaborated "it's a double edged sword I think, umm, it's taking you a little bit higher but it's also relaxing you at the same time, which allows you then to come back down again." p. 638. "If the depression isn't too severe it can break that "cycle and make, you know, the depression lift. It is when I am at either extreme that it's non beneficial when I am particularly depressed or particularly high, when I'm at the spectrum in between, you know, mildly depressed or mildly hyper it can sometimes turn the mood." p. 638.



Finding 5	Exercise can provide structure to one's daily routine. (U)
Illustration	"You tend not to do anything and it's just a horrible unstructured day, whereas when I'm exercising, when I'm out in the mornings I'm out most of the morning until maybe lunchtime and it sort of, you know, it breaks the day up." p. 638.
Finding 6	Exercise can have an internal structure or an inherent rhythm. (U)
Illustration	"There's something about the rhythmicity of pacing and walking that is really, really useful, and in fact what I notice about all the sports I do, and have done a lot of, they are all very rhythmical so I swim, I cycle, I walk, I row, you know, I have played squash but I have never really gotten into it...and I have played tennis but...it doesn't really grab me, kind of, the thing of like running here, running there...and then I used to run as well...and I think that that kind of rhythmicalness is quite, err...there's something settling about it." p. 639.
Finding 7	Engaging in regular exercise can have calming effects both during and in between episodes of depression and mania. (U)
Illustration	"just calms me down". Sharon explained: "If I am hypomanic it [exercise] calms me down....If my husband thinks I am having trouble breathing he will go and stick me on the treadmill." Thus Sharon uses the very rhythmic exercise of treadmill running to help calm her down. p. 639.
Finding 8	Regular exercise may facilitate clear thinking. (U)
Illustration	Alice explained that whilst feeling high: "I certainly do feel that my thoughts are a bit chaotic...I think that the rhythmicity of the kind of exercise I do, I think it helps actually settle down, settle down the thoughts." p.639. When exercising during an episode of depression, Belinda finds that "the fog kind of lifts from my brain, and I can think a bit more clearly. I mean I can't always function at the level I'd like to, but it just helps me to, you know, get up and out, and think clearly". p.639.
Finding 9	Many expressed fear that exercise may introduce further chaos into their lives. (U)
Illustration	"[if I exercise] I suppose I feel as though something will trigger in the back of my head that says 'carry on'. In the past remissions have lasted one or two years this one is the longest it has gone on and I don't really want to stop what work I have done so far." p.639 "Sometimes I know with depression that I'm fighting a losing battle and I need to reserve all my energy to get better" p.639.
Shiner B, Whitley R, Van Citters AD, Pratt SI, Bartels SJ. Learning what matters for patients: qualitative evaluation of a health promotion program for those with serious mental illness. Health Promot Int. 2008;23(3):275-82.	
Finding 1	Prompting by a primary care physician or mental health provider was the most common reason cited by participants for changing eating habits and exercising. (U)
Illustration	The reason I was encouraged so much to join In Shape is because I have diabetes, and at that particular time they were saying if you don't straighten out you are going to be put on insulin. So that was one of the motivating factors to get me started, and I went on the exercise routine two or three days a week, plus I went on a low-carb diet . . . and the pounds just came right off. p. 278
Finding 2	Open access to fitness facilities helped them engage in exercise and the presence of a health mentor at the gym enabled them to feel comfortable going to the gym, a

	place they had found intimidating in the past. (U)
Illustration	... having somebody to report to. . .it makes me feel good to say 'Shirley, I went to the gym three times this week', and she's proud of me because I did it. That's important to me, having somebody to say I did it, I went three times this week or I went twice this week, or I increased my reps, I increased my weights you know, that's important to me. p. 278
Finding 3	Successful adaptation of healthy dietary practices require a combination of easily understandable suggestions and modelling. (U)
Illustration	Trying new foods, that's very hard for me. I don't like vegetables. I like peas and asparagus you know. [My health mentor] got me to try like sweet potatoes, disgusting. She got me to try salmon, I love it. . .I love it. Oh my gosh—I sauté it in a little bit of olive oil with some garlic and oh my gosh. Same with scallops, she got me to try those. The salmon was really. . .I tell you it took me about 5 minutes to put that first bite in my mouth, it just looked so funky but yeah I love it. . .I'm going to be trying spaghetti squash this week. . .So you know she's like 'You've got to change your attitude woman about new foods.' She's really great. p. 279
Finding 4	Kindness of the IN SHAPE Staff was an important facet of the program. Most described their health mentors as 'friends', they were quick to point out that the health mentors were different than other people in their lives, noting that they were supportive and non-stigmatizing. (U)
Illustration	Just make sure you have people that care about others, that aren't going to make them feel like they are just dust under their feet or whatever, or that they are better than other people; that doesn't go over very well, and then people don't want to come back. I know I wouldn't. It means a lot when people take the time to care and to work with you and others. p. 279
Finding 5	By gaining control over aspects of their health through diet and exercise, participants gained self-confidence as they developed new social skills and healthy behaviors and an enhanced sense of self-efficacy. (U)
Illustration	I was just determined because I saw myself as being very fat. Someone who is determined to lose the weight. . . Cause you see yourself as really being obese, and you don't really like yourself, so it kind of gives you an incentive to lose the weight so now I look better. p. 280
Finding 6	The integration of the exercise program into community-based gyms seemed to foster a sense of normalcy. (U)
Illustration	It was just cool when I worked out, and I broke down those barriers that I should go. . .Even if it was just 10 minutes at a time, it was a good 10 minutes, and then it kind of grew into a larger space and started cascading into it like into a real deal where I was actually really ok. . .it was like teaching you that you can be kind of weird, not weird, but you can live a normal life, and you're a good person too you know. . .it was just like getting out in another part of recovery, it was another part of my deal. p. 280
McDevitt J, Snyder M, Miller A, Wilbur J. Perceptions of barriers and benefits to physical activity among outpatients in psychiatric rehabilitation. J Nurs Scholarsh. 2006;38(1):50-5.	

Finding 1	The effect of the mental illness itself [is a barrier to physical activity]... that could include profound avolition, or lack of initiative, that is a defining symptom of psychotic and affective disorders. (U)
Illustration	Once you experience some trauma, you've been depressed, you feel like you're carrying the weight of the world on your shoulders. You can't even find yourself getting up out of bed, let alone going to exercise. p. 52
Finding 2	A Common experience directly affecting activity was the side effects of sedation when a new medication was started...finding the right medications could take months. (U)
Illustration	"makes you so lethargic and like so out of it and drained." p. 52
Finding 3	The weight gain associated with many of the medications was a serious, long-term problem that affected their physical activities. (U)
Illustration	I'm not trying to sound judgmental, but you look around and all of us have gained. . . I used to be overweight, but a lot of us have gained weight because of our medication that we're on. It makes you want to eat. It's hard to exercise when you're really overweight. p. 52
Finding 4	The structure of rehabilitation (life-skill building, vocational training, expectations for personal responsibility, and recreational activities) created a community of belonging, structure, and support., yet this very structure also created a context in which participants viewed the program staff as being in charge. (U)
Illustration	It depends, it's kind of the personality of the staff . . . . If the staff is a little lazy, likes to eat, we'll be spending the day inside, 'cause we just got satellite installed. So we're going to be sitting at home watching TV. p. 52
Finding 5	Feeling vulnerable and unsafe when out in public...This feeling was related not only to the low-income neighborhoods in which they lived, but also to fear of being identified as a person with a mental disorder. (C)
Illustration	"Everybody's putting you in a category without even thinking about it." Even worse, the participants were aware that being physically attacked had happened to other clients, and it could happen to them. p. 53
Finding 6	Physical activity helped some participants to feel more energetic, less stressed, and to sleep better. (U)
Illustration	Certain days I wake up and when I start walking, I get that spirit in me and it's a happy feeling. When I go to sleep at night, I can have a real nice rest. I feel good about myself. p. 53. It gives me a sense of release where I don't have to deal with the struggles going on in the world. Like the pain or hardship, I don't really have to deal with. Just for that little bit of time, I'm free. p. 53
Finding 7	Participants broadened the meaning of physical activity to include working, volunteering, or even just doing crossword puzzles. (U)
Illustration	Working in the kitchen is beneficial. It's doing some activity other than sitting in the lounge all day doing nothing. You're gaining some skills like being on time. Skills are important for a job, so you can be there. p. 53

Finding 8	Being active was identified as a key to recovery from mental illness. (U)
Illustration	You have to really get involved in something in order not to give in to the depression. And I don't want to and then I will maybe slide deeper in laziness. I start doing more, and I then become more involved in my life. p. 53

## Appendix V: Synthesized finding One - categories and findings

<b>Meta-synthesis 1: Social barriers—stigma and access are significant barriers to healthy eating and physical activity.</b>	
<b>Findings</b>	<b>Categories</b>
Participants indicated they reduced the amount of outdoor physical activities they engaged in because they were worried about unfriendly looks from others and feared being recognized by acquaintances. (U)	Stigma
The reluctance of some health professionals to see consumers [mental health patients] for physical health issues when requested by nurses was attributed to stigma by some and pessimism about change. (C)	
Participants gave narratives describing the internalized negative effects from their experiences, affecting their ability to live healthy lives. (U)	
Feeling ashamed of being mentally ill led to withdrawal and passivity and hindered physical Activity. (C)	
Structural stigma leading to exclusion from healthy lifestyle choices was the most frequently referenced barrier across all focus groups. Inadequate social benefits affected participants' ability to afford healthy food choices, safe housing, social interaction, and transportation to be able to attain food from stores other than local convenience stores. (U)	
Availability of a free or low-cost program would go a long way to ensuring program success. The ideal scenario is that a program would be offered free-of-charge. (U)	Lack of access to safe and affordable options for healthy eating and activity.
Most participants found that it was easier to be active when they had easy access to facilities that enabled activity or had exercise equipment. (U)	
Clinicians believed their clients were aware of the physical health benefits of exercise but rarely engaged in it due to various barriers. (U)	
Geographic barriers to physical activity were of an environmental kind: long distances involved in rural and remote areas, the climate of the region, and the availability of facilities for physical activities. (C)	

Safety was an obstacle [to exercise] that many clients encountered. (U)	
Feeling vulnerable and unsafe when out in public...This feeling was related not only to the low-income neighborhoods in which they lived, but also to fear of being identified as a person with a mental disorder. (C)	
A lot of consumers having no money, and living in poverty and resource shortages. (C)	
Not having a familiar and safe environment to exercise was a barrier, as exercising outside caused him anxiety and fear. (U)	
Housing was identified as significant to being able to live healthily, with sleep and stress being affected by poor housing. (U)	
An unsupportive physical environment, including inclement weather (e.g., rain, too hot, cold) or poor accessibility to physical activity facilities, was also identified as a barrier to physical activity. (U)	
Clinicians believed that physical health complications, symptoms, and transportation were most salient for their clients. (U)	
No matter what the motivation was to be active, this was not sufficient without a PA enabling environment. This included supportive staff, the availability of equipment, safe environment and an opportunity to be active. (U)	
Disruptions to income and lack of financial means to engaging in activity. (U)	
Being on a fixed income made finances a barrier to making lasting healthy behavior changes. (C)	
Lack of resources: Informants who were working had a much better financial situation compared with those without a job. (U)	
Clinicians described their clients as generally inactive except for some that used walking as a form of transportation. (C)	

## Appendix VI: Synthesized finding two - categories and findings

<b>Meta-synthesis 2: The disabling physical and psychological symptoms of mental illness, medication side effects and accompanying co-morbid conditions are significant barriers to health eating and physical activity.</b>	
<b>Findings</b>	<b>Categories</b>
Some did not consider exercise to be a useful tool for symptom management...This opinion was particularly strong in relation to the impact of exercise upon mania. (U)	Physical exercise can be a double-edge sword
Exercise was viewed as having the potential to be both helpful and harmful at the same time. (U)	
Many expressed fear that exercise may introduce further chaos into their lives. (U)	
Clinicians believed that physical health complications, symptoms, and transportation were most salient for their clients. (U)	Comorbid conditions and discomfort are a barrier to physical activity.
Participants often indicated that certain physical conditions (i.e., older age, physiological diseases, and psychiatric auditory hallucinations) and side effects of psychiatric medications hindered their physical activity participation. (U)	
Physical health problems and associated discomfort was also seen as a barrier for some consumers. (C)	
Co-morbid health problems including overweight and problems with their legs. (U)	
Impact of the illness and effects of the medications reduce participant's self-esteem and confidence to participate in physical activities. (U)	Medication side effects are a common and disabling barrier to healthy eating and physical activity.
Participants noted that due to their mental health situation what they care about is what tastes good and what helps them to feel good, and not if it is healthy. (U)	
Medications made them feel tired or sleepy and this interfered with their ability to function during the day, and made engaging in physical activity difficult. (U)	
Psychiatric medications contributed to physical limitations affecting their ability to become involved in any kind of physical activity. (U)	
The weight gain associated with many of the medications was a serious, long-term problem that affected their physical activities. (U)	
A Common experience directly affecting activity was the side effects of	

sedation when a new medication was started...finding the right medications could take months. (U)	
Subjects felt medications made them gain weight (U)	
Mental and physical problems interfered with participants' ability to live healthily. (U)	
Co-morbid health problems including overweight and problems with their legs. (U)	
Participants often indicated that certain physical conditions (i.e., older age, physiological diseases, and psychiatric auditory hallucinations) and side effects of psychiatric medications hindered their physical activity participation. (U)	
Participants identified social stigma-lack of understanding from different large social groups (including health care professionals, social agencies, employers, and landlords) as producing barriers to healthy living. (U)	
The impact of psychiatric medications caused difficulties in regulation of the times of the day at which they eat and the quantity of food they eat. (U)	
Experiences of the body hindered being physically active. (U)	
A general but profound lack of motivation prevented many from exercising. (U)	Symptoms of severe mental illness are a barrier to healthy eating and physical activity.
It is not the wanting to do things that is failing, it is the ability to carry them out. (U)	
Motivation was the most salient obstacle to exercise. (U)	
Psychotic symptoms made participants afraid to leave the house. (C)	
Efforts by staff to support consumers in lifestyle changes despite what they perceived as low motivation in consumers. (C)	
Participants described their mental health situation including lack of energy and emotional availability as barriers to involvement in physical activities during periods of relapse. (U)	
Informants were hesitant to initiate regular physical activity in fear of not getting results, which could make them feel dissatisfied with themselves. (U)	
Not ready to engage in physical activity; when they perceived their illness to be at its most severe, the needs of the body were neglected... it was as though they were completely consumed in their mind, they were living and existing in their minds and their bodies were left desolate, rendering PA	



impossible. (U)	
PA was driven by the embodied urge to free themselves of some of their perceived negative symptoms and lethargy associated with the medications. (U)	
Participants often indicated that certain physical conditions (i.e., older age, physiological diseases, and psychiatric auditory hallucinations) and side effects of psychiatric medications hindered their physical activity participation. (U)	
Symptoms related to SMI (e.g. negative symptoms in schizophrenia spectrum disorders) are a major barrier for clients to exercise. (U)	
The effect of the mental illness itself [is a barrier to physical activity]... that could include profound avolition, or lack of initiative, that is a defining symptom of psychotic and affective disorders. (U)	
Feeling mentally unwell with depressive mood and anxiety or panic attacks were commonly mentioned obstacles to physical activity. (U)	
The mood disorder as a formidable barrier in itself creating a vicious cycle. (U)	
Auditory hallucinations were a factor preventing cooking of healthy meals (U)	
Psychotic symptoms made participants afraid to leave the house. (C)	
A general but profound lack of motivation made it difficult to go shopping and to plan and prepare healthy meals. (U)	
Impact of the illness and effects of the medications reduce participant's self-esteem and confidence to participate in physical activities. (U)	
Mental and physical problems interfered with participants' ability to live healthily. (U)	
Social anxiety including panic attacks and social avoidance emerged as the most prominent barrier [to physical activities]. (U)	

## Appendix VII: Synthesized finding three - categories and findings

<b>Meta-synthesis 3: Structured wellness/health promotion programs that include provider and family support and the opportunity to establish connections with others facilitate accomplishment of healthy eating and physical activity.</b>	
<b>Findings</b>	<b>Categories</b>
Participants found it easier to engage in physical activity when they received encouragement from healthcare professionals. (U)	Program and providers need to support clients to reach health behavioral goals.
The physical therapist is an important ally, as a supportive person “setting the pace” and increasing their motivation both by being attentive and by suggesting strategies to come around barriers such as pain. (U)	
Open access to fitness facilities helped them engage in exercise and the presence of a health mentor at the gym enabled them to feel comfortable going to the gym, a place they had found intimidating in the past. (U)	
Prompting by a primary care physician or mental health provider was the most common reason cited by participants for changing eating habits and exercising. (U)	
Kindness of the IN SHAPE Staff was an important facet of the program. Most described their health mentors as ‘friends’, they were quick to point out that the health mentors were different than other people in their lives, noting that they were supportive and non-stigmatizing. (U)	
Successful adaptation of healthy dietary practices require a combination of easily understandable suggestions and modelling. (U)	
Support networks provide the structure, encouragement and purpose that many needed. (U)	
The importance of trained gym instructors and nursing staff to support them in participating in physical activities. (U)	
Clients offered several strategies to increase motivation to exercise. (C)	
Clinicians recommended pedometers and rewards as the most effective strategies to incentivize clients to exercise. (U)	
Participants indicated that it is easier to engage in physical activity when the activities were self-chosen or a preferred modality. (U)	
Participants at any stages of the illness, some form of pre-exercise routine appeared to take place. (U)	

Participants broadened the meaning of physical activity to include working, volunteering, or even just doing crossword puzzles. (U)	
Most participants exercise outside of the gym [despite free membership through In SHAPE] and preferred non-vigorous aerobic exercises (e.g. dancing, walking) set to music that kept their “minds” occupied in contrast to strenuous activities such as spinning or weight and resistance training. (C)	
Walking, yoga, swimming, and weight lifting as the most desired exercise options because they were fun, economically feasible, and activities they had done previously. (U)	
Other participants had opposite feelings about being in a group. (U)	
Doing PA as therapy; participants described how they purposively used PA as part of their therapy and recovery. However, this was something which they had chosen to do and was not necessarily on their care plan. (U)	
Not being confined to the home was very important. (U)	
Nature calmed their nerves. (U)	
Exercise can have an internal structure or an inherent rhythm. (U)	
Participants appreciated training in a group with others who share the same problems. Just knowing that others might feel similar is a nice feeling, according to another participant. (C)	
A program specifically for individuals with a mood disorder would have the potential to create a sense of community and sharing with other people who were “in the same boat”. (U)	
They [participants] cited that there was a culture of not doing a lot in the facility, and to cope with this lack of activity, food served as a distraction when feeling bored. (U)	
The structure of rehabilitation (life-skill building, vocational training, expectations for personal responsibility, and recreational activities) created a community of belonging, structure, and support., yet this very structure also created a context in which participants viewed the program staff as being in charge. (U)	
Family emotional support in recognizing efforts and celebrating progress encourage pursuit of health goals. (U)	Family support and positive role modeling is needed to facilitate healthy eating and physical activity.
Practical support such as transportation and financial support from family was essential for helping participants access fitness facilities and grocery stores. (U)	

Participants benefited most when family members either modeled healthy behaviors or joined them in changing their eating and exercise behaviors. (U)	
Social support for health behavior change could be increased by improving family communication skills. (C)	
Setting mutual health goals with a family member or significant other could create a natural support system to help participants reach their health goals (U)	
Participants agreed that verbal encouragement or accompaniment by friends and family increased their physical activity participation. (U)	
Participants reported feeling motivated to engage in health behavior change when they received positive reinforcement through clear indicators of progress (i.e., weight loss, fitting in old clothes), and praise and encouragement from family members or friends for specific health behaviors and outcomes. (U)	
Informants stressed that it was important to have someone to share with and that it was encouraging and helpful to get positive and affirmative response from others. (U)	
Family and friends gave them the support, encouragement, and practical help around daily tasks so that they could improve their own health. (U)	
Lack of companionship was experienced when the support from others felt consuming or demanding rather than nurturing. (U)	
It was difficult to adhere to the nutrition principles they were being taught if there were no support to do so and others did not do so. (C)	
Unhealthy behaviors of others made it more difficult for participants to make desired changes. (U)	
The social environment may undermined their goals of maintaining a healthy lifestyle. (U)	
Educating family members about the In SHAPE program goals and activities was necessary to increase support for it. (U)	
Informants stressed that it was important to have someone to share with and that it was encouraging and helpful to get positive and affirmative response from others. (U)	Group activities promote healthy behavior through establishing connectedness.
The primary facilitator identified by participants was having a support and accountability system in place for engaging in healthy behaviors. (U)	

Getting involved in social activities with other people, as opposed to spending the day by oneself, was a desired way to improve their own health. (U)	
Clients offered several strategies to increase motivation to exercise. (C)	
Clients were most interested in a walking group because of the social interaction component. (U)	
Clinicians' thought a walking group would be effective for their clients because it would provide them with the opportunity for social interaction and then they would experience the secondary gain of improved health. (U)	
An unexpected result of the focus groups was that participants began to problem solve many barriers. (C)	
The importance of being part of a caring community with encouragement as a central tenet. (U)	
Physical activity helped with social interaction, as exercising as part of a group and walking with people made participants feel included, which assisted with building new friendships and giving them a feeling of connectivity. (C)	
Friendship was identified as a major component [to a healthy lifestyle] which allowed acceptance, support, and connection to a community. (U)	
Being physically active enables companionship with others. (U)	
Connecting with nature increased the likelihood of engaging in physical activity. (U)	
Being physically active enables companionship as a connection to oneself. (C)	
Social support could increase participants' motivation to change their health behaviors. (U)	
Lack of support from peers and family became a factor that limited physical activity participation. (U)	
Lack of companionship supporting a healthier life-style in their community residential mental health facility was mentioned as a barrier to healthier eating as well as to involvement in physical activities. (U)	
Lack of supporting companionship was a barrier to physical activities. (C)	
No matter what the motivation was to be active, this was not sufficient without a PA enabling environment. This included supportive staff, the	

availability of equipment, safe environment and an opportunity to be active. (U)	
Most participants felt exercise could improve health (e.g., helping to lose weight and reducing physical symptoms of pain and discomfort) and promote mental health (e.g., improving sleep and regulating moods). (U)	A general awareness that physical activity and healthy eating prevent disease motivated some to act.
Informants stressed the importance of understanding that your health deteriorates if you are obese and physically inactive. (U)	
Preventing negative health consequences motivated participants to make positive changes in health behaviors. (C)	
Spiritual and emotional health were identified as important to a healthy lifestyle. (U)	
Healthy eating and exercise were recognized as part of a healthy lifestyle. (U)	
By gaining control over aspects of their health through diet and exercise, participants gained self-confidence as they developed new social skills and healthy behaviors and an enhanced sense of self-efficacy. (U)	
Having work either volunteer or paid was significant to a healthy lifestyle and gave personal value, confidence. (U)	
Lack of knowledge as to higher risk of developing type 2 diabetes. (U)	
Participants indicated that low levels of confidence in engaging in activity limited their physical activity participation and would rather not to perform exercise in order to avoid physical tiredness when and after exercising. (U)	
However, some participants were disappointed that exercise did not bring about the strong, euphoric sensations that they had expected. (U)	
A major barrier to changing eating habits was the “traditional” Latino diet including a reliance on rice, meat, and “few vegetables.” (C)	
Misconceptions about physical activity. (U)	
Lack of resources: Informants who were working had a much better financial situation compared with those without a job. (U)	
Making a firm decision before starting was considered important. (U)	
The immediate negative outcomes of pain reduced physical activity for some of the informants. (U)	

## Appendix VIII: Synthesized finding four - categories and findings

<b>Meta-synthesis 4: Physical activity enhances enjoyment in life and well-being and can positively impact mental health symptoms.</b>	
<b>Findings</b>	<b>Categories</b>
Endorphins and 'the feel good factor' were reported by participants to be an important feature in being physically active as exercising was beneficial for physical and mental well-being. (U)	Physical activity enhances enjoyment in life and wellbeing.
Physical activity benefits positive self-esteem and body image. (U)	
Even though resistance can be a paramount feeling, the participants said that the concreteness of challenging their bodies in strenuous movements provided a feeling of actually carrying something out. (U)	
Participants described a change of increased alertness, softness, mobility, and energy. (U)	
Being physically active was related to increased joie de vivre and feelings of happiness and joy. (U)	
Physical activity helped some participants to feel more energetic, less stressed, and to sleep better. (U)	
Being physically active was an important way to increase alertness and was considered a means to achieve more during the day. (U)	
Feeling more alive but not euphoric; To sense the vigorous, moving body in exercise felt great. (U)	
Physical activity was related to feelings of freedom and independence. (U)	
Exercise can provide structure to one's daily routine. (U)	
The integration of the exercise program into community-based gyms seemed to foster a sense of normalcy. (U)	
Most participants felt exercise could improve health (e.g., helping to lose weight and reducing physical symptoms of pain and discomfort) and promote mental health (e.g., improving sleep and regulating moods). (U)	
Being 'part of Physical activity something' and being involved in a programme added to 'a sense of achievement' and of feeling empowered. (U)	
The experience of mastering something gave self-confidence and rendered it possible for the individual to be more independent. (U)	

Being physically active reduced feelings of worthlessness related to inactivity. (U)	Physical activity decreases mental health symptoms by calming, distracting, and improving one's mood.
To keep dreams alive gives strength to live. (U)	
Participants found that regular physical activity such as walking and structured exercise programmes, aerobic classes and gym work such as weights and exercise bikes improved their daily life. (U)	
Respite for recovery involved physical activity as an opportunity to experience curative milieus for healing. (C)	
Being active was identified as a key to recovery from mental illness. (U)	
Clients described walking primarily for its positive impact on their mood, physical health benefits, and for enjoyment. (U)	
Participants discussed positive and negative effects of exercising when hypomanic or manic. These effects often involved an initial feeling of calm following by an increase in symptoms of mania. (U)	
A release of stress appeared to be reinforced by the visual and actual felt sensation of sweat and its associated heat. (U)	
Participants' experiences that the exercise intervention sparks a sense of being capable, as physically active people, in contrast to feeling entrapped in their depressed state. (U)	
Physical activity was a means to make life richer and more stimulating as well as something to look forward to. (U)	
Variety of PA was described which helped individuals distract them from their voices. This included setting goals such as the amount of time on an exercise machine (Ann, Tina), learning a new skill or conducting intense and stimulating PA. (U)	
Having a routine with expected activities helped them manage their health. (U)	
Majority of participants acknowledged the benefits of physical activity as a distraction from mental health issues and in getting them out of the house as a good way to keep their mind occupied from negative thoughts. (U)	
Daily life was often experienced as empty, and the capacity for being physically active gave participants the chance to create their own meaningful content in life. (U)	
Participants purposively chose low intensity PA as it provided them with the time and space to work through thoughts (U)	
Liberation through being physically active release the person from	



troublesome thoughts. (U)	
When participants began to recover and experience PA, they described how they began to engage in a real and physical space, which is in contrast to the 'murky hole'. (U)	
PA helped them to develop an identity in which they felt 'normal'; for some participants, this was the recognition of a former sporting self, for others it was a recognition of a self without the entrapments of mental illness. In both circumstances, it appeared to help settle the troubled relations in mind and self. (U)	
Exercise helped to start crawling out of depression's "cocoon". (U)	
Physical activity generated liveliness and energy. (U)	
Engaging in regular exercise can have calming effects both during and in between episodes of depression and mania. (U)	
Some reported consistently regulating their exercise patterns and unequivocally finding exercise to be a useful tool in symptom management... talked about exercise as a means of extending euthymic periods, but also as a means of reducing the intensity of depressive or hypomanic episodes. (U)	
Regular exercise may facilitate clear thinking. (U)	