Promoting physical activity among individuals diagnosed with schizophrenia and related disorders: testing a skills-based curriculum

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PROMOTING PHYSICAL ACTIVITY AMONG INDIVIDUALS
DIAGNOSED WITH SCHIZOPHRENIA AND RELATED DISORDERS:
TESTING A SKILLS-BASED CURRICULUM

by

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DEDICATION

This dissertation is dedicated to all of my friends and family

who have supported me in pursuit of my dream

and especially my husband,

Alex Coleman,

who has been a cheerleader, counselor,
teacher and friend in his love and support throughout this journey.
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ABSTRACT

Individuals diagnosed with serious mental illnesses die, on average, 25 years earlier than the general population. This early mortality rate is attributed to negative symptoms that make healthy behaviors, such as exercise, difficult, as well as to antipsychotic medications that carry significant physical side effects. Exercise has been shown to improve life expectancy and studies have shown that even chronically mentally ill individuals are capable of participating in physical exercise with support.

Mental skills such as goal setting, visualization, self-talk, and energy management have been taught to the general population to improve exercise behavior. These skills have also been taught successfully to individuals diagnosed with serious mental illnesses for the purpose of symptom management. This, however, is the first study to examine the effects of teaching these mental skills to people diagnosed with serious mental illnesses for the purpose of promoting exercise.

This dissertation examines a six-week skills-based curriculum highlighting the benefits of exercise as well as teaching a set of mental skills described above. Ten individuals participated, most were in their early twenties and all carried a diagnosis of...
schizophrenia or a related disorder. Participants were assessed at baseline, immediately following the intervention, six weeks after the intervention, and 12 weeks after the intervention.

Measures included the Rapid Assessment of Physical Activity (RAPA), a semi-structured interview inquiring about the different mental skills and a quality of life questionnaire. Participants also completed helping alliance and consumer satisfaction surveys at the end of the intervention.

A 73% attendance rate was noted and statistically significant differences were seen in physical activity and mental skills knowledge between baseline and immediately following the intervention and between baseline and 6 weeks post-intervention. No quality of life change was indicated. These results indicate that the intervention was acceptable to the population as evidenced by an adequate attendance rate and that further research is warranted due to the statistically significant improvements in two outcome areas.

These findings indicate that a skills-based curriculum teaching motivational skills to individuals diagnosed with serious mental illnesses is an intervention worth exploring further with larger and more diverse samples.
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INTRODUCTION

1.1 Rationale for the study

Individuals diagnosed with serious mental illnesses (SMIs) are at an increased risk for physical illness and mortality compared to the general population (Viron, Baggett, Hill, & Freudenreich, 2012). On average, people in the United States living with a SMI die 25 years earlier than people who are not living with these disorders (Viron et al., 2012). Schizophrenia and related disorders are considered SMIs and are characterized by negative symptoms such as a lack of motivation, restriction of thinking, and withdrawal from social connections in addition to the more commonly recognized positive symptoms - delusions and hallucinations. These negative symptoms contribute to the poor health of individuals diagnosed with schizophrenia and related disorders (Viron et al., 2012; van Os & Kapur, 2009). Side effects of the medications used to treat these symptoms also contribute to the poor health of these individuals; they include rapid weight gain, fatigue, and muscle rigidity (Viron et al., 2012). For these reasons, it is difficult for individuals diagnosed with these disorders to engage in healthy behaviors, particularly exercise, which contributes to the disparity in life expectancy seen between individuals living with these disorders and those who are not (Viron et al., 2012). This dissertation examines a curriculum that aims to help individuals diagnosed with schizophrenia and related disorders overcome these barriers and participate in exercise regularly.

Research has shown that regular exercise can protect against disease development, strengthen muscles and bones, and prolong one’s life expectancy (CDC,
In addition to these physiological benefits, exercise has also been shown to reduce symptoms of anxiety and depression while improving quality of life as measured by self-reports (Walsh, 2011). Since individuals diagnosed with SMIs are at an increased risk for physical illness and early mortality, it is important that exercise be incorporated into their treatment plans (Dixon et al., 2009).

Given the known benefits of exercise and the risks associated with SMIs, interventions have been developed to engage individuals diagnosed with SMIs in exercise regimens. Many of these interventions have been successful, boasting adherence rates of 73–80%, while showing improvements in BMI, weight, body-image, and quality of life (Holley, Crone, Tyson, & Lovell, 2010). The success of these interventions proves that it is feasible for this population to participate in exercise programs.

When participating in exercise intervention studies, those participants diagnosed with SMIs attend sessions regularly, but it is unknown whether these individuals continue to exercise when the studies close. Even when individuals diagnosed with SMIs were given free access and transportation to a local fitness facility, 90% of them dropped out of the study after six months. When members of the general population were given the same opportunity, only 50% of participants dropped out after six months (Warren et al., 2011).

Though there is a clear disparity between the dropout rates of individuals diagnosed with a SMI (90%) and members of the general population (50%), both groups lost a significant number of people after six months. Research has been conducted to identify the barriers specific to each of these groups to inform interventions designed to
promote exercise among these populations (Sherwood & Jeffery, 2000; Brawley, Rejeski, & King, 2003). Across populations, structured interventions focused on skill development have been most successful in promoting healthy behaviors, such as exercise (Sherwood & Jeffery, 2000; Brawley et al., 2003; Bartels & Desilets, 2012).

Successful interventions promoting exercise in the general population have focused on goal-setting, visualization, arousal regulation and self-talk (Saelens, Sallis, Calfas, Sarkin, & Caparose, 2000; Andersson & Moss, 2010). These same mental skills have also been successfully taught to individuals diagnosed with SMIs (Goldberg, Wheeler, Lubinsky, & Van Exan, 2007; Casallas, 2004). Based on these facts, I contend that these mental skills - goal-setting, self-talk, arousal regulation, and visualization - can be taught to individuals diagnosed with SMIs to increase and maintain their participation in physical activity.

1.2 Specific research questions

Since individuals diagnosed with SMIs, including schizophrenia and related disorders, are at an increased risk for disease and early mortality, it is important that they engage in healthy behaviors such as exercise. This skills-based curriculum aims to promote physical activity engagement among individuals diagnosed with schizophrenia and related disorders, receiving outpatient treatment at the Massachusetts Mental Health Center.

The curriculum focuses on mental skills (goal-setting, self-talk, visualization, and arousal regulation) and the benefits of exercise, while also providing information regarding exercise resources. Each session is designed to last one hour and sessions are
conducted using PowerPoint presentations, handouts, worksheets, in-session activities, and group discussions. Data collection from beginning to end spanned six months. Data was collected at baseline; prior to the intervention, immediately following the last intervention session, and at six, and 12 weeks after the last intervention session.

The study was designed to answer the following questions:

Do participants show an increase in physical activity?

Do participants who engage in a skills-based intervention show improvement in their knowledge of and ability to apply mental skills?

Do participants show an improvement in quality of life?

1.3 Significance of study

Individuals diagnosed with SMIs, including schizophrenia and related disorders, face many physical health problems that may be mediated by exercise (Viron et al., 2012). The literature also indicates that exercise yields psychological benefits including symptom reduction – most notably anxiety and depression, better functioning and improved quality of life (Walsh, 2011; Wolff et al., 2011; Holley et al., 2010). Despite the benefits of exercise for individuals diagnosed with SMIs, commitment to regular exercise for this population tends to be very low (Warren et al., 2011). The purpose of this intervention is to increase physical activity participation among individuals diagnosed with schizophrenia or related disorder, by teaching them skills for self-motivation. It is the intention of this intervention to increase physical activity participation among this population to aid individuals in mediating the physical health risks associated with schizophrenia and related disorders.
RELEVANT PREVIOUS RESEARCH

This section examines what is known about the connection between mental health and exercise; the benefits and importance of exercise for individuals diagnosed with SMIs; factors contributing to the success of exercise programs developed for individuals diagnosed with SMIs; factors contributing to the success of health promotion programs with different populations; factors and relevant theory on increasing engagement in physical activity; and how the skills incorporated in this curriculum have been used successfully to promote physical and mental health in the past.

Serious Mental Illnesses

SMIs, according to the National Alliance on Mental Illness, include bipolar disorder, schizophrenia, major depression, post-traumatic stress disorder, obsessive-compulsive disorder, panic disorder, and borderline personality disorder (NAMI, 2013). The literature reviewed here focuses on the research surrounding bipolar disorder, major depression, and schizophrenia, as these three disorders are characterized by three common symptoms: lack of motivation, isolating behavior, restricted thinking, withdrawal from social situations, and an inability to derive pleasure from experiences that were once pleasurable. Such symptoms make it difficult for individuals to engage in many self-care behaviors, including exercise.

SMIs and Exercise

Exercise is especially essential for individuals diagnosed with SMIs as they are at an increased risk for cardiovascular disease, respiratory diseases, and early mortality, largely due to obesity (Viron et al., 2012). Individuals diagnosed with schizophrenia
have also been shown to exhibit reduced lung function when compared to healthy controls (Vancampfort et al., 2011). Compounding these conditions are the side effects of the medications employed to treat symptoms of schizophrenia and other SMIs. These side effects, most notably weight gain, fatigue, and muscle rigidity, tend to increase these individuals’ risk for disease (Vancampfort et al., 2011).

Furthermore, individuals with SMIs – schizophrenia in particular – frequently manifest metabolic problems. For reasons not well understood, the problems appears to be linked to both the cure and the condition: not only are they often associated with the anti-psychotic medications used to treat symptoms, but some studies have also found individuals experience metabolic problems even before the treatment is initiated. One such problem in particular, Metabolic Syndrome, is a symptom cluster known to emerge in people diagnosed with schizophrenia. It includes abdominal obesity/increased waist circumference, high blood pressure, high cholesterol, and glucose abnormalities (Harris et al., 2012).

Such symptoms, in individuals with or without SMIs, can often be mediated by increased physical activity. Yet the research suggests that SMI-afflicted individuals may be particularly unlikely to exercise. One study, for example, found that although Metabolic Syndrome symptoms can be reduced by modifying eating and exercise behaviors, only 25.7% of individuals diagnosed with schizophrenia meet the minimum public health recommendation regarding exercise (150 min/week), compared to 52% of the general population (Vancampfort et al., 2010; CDC, 2013). For Metabolic Syndrome and other SMI-related conditions, the grim combination of symptoms and side effects
makes exercise all the more valuable and simultaneously more difficult to pursue.

**Physiological and Psychological Benefits of Exercise**

It is widely accepted that exercise is beneficial for physical and psychological well-being. The physiological benefits of exercise include disease prevention, the strengthening of muscles and bones, prolonged life expectancy, and more (CDC, 2013). Moreover, research has indicated that regular exercise can affect the brain. For example, one study found that regular exercise over the course of three months increased brain volume in the hippocampal regions. This was true not just for healthy control subjects, but for matched individuals diagnosed with schizophrenia. Individuals who had earlier exhibited smaller hippocampal regions that medications showed increased volume as the result of exercise, despite the fact that medications had previously not been helpful in this way (Harris et al., 2012). This finding indicates that exercise is capable of positively affecting the brain from a physiological standpoint, not just psychological. Indeed, multiple studies testing the effects of exercise on patients diagnosed with SMIs have identified one or both kinds of benefits. Studies conducted with overweight individuals diagnosed with SMIs have also been evaluated for their impact on BMI and body fat (Wolff et al., 2011). Several have indicated statistically significant decreases in BMI and body fat, both of which increase one’s risk for heart disease (Wolff et al., 2011). This is yet another way in which regular exercise can yield physiological benefits.

In an in-depth review of the literature pertaining to the mental health benefits of exercise for individuals diagnosed with SMI, 15 studies were reviewed (Holley, Crone, Tyson, & Lovell, 2011). A statistically significant improvement in mental health/general
psychological well-being was noted as defined and measured by the attributes of competence, social interest, and self-image (Holley et al., 2011). This finding was replicated in all 12 studies that measured this outcome area (Holley et al., 2011). Though the studies examined were extremely diverse in terms of intervention, size, and population, it is notable that all twelve studies examining general psychological wellbeing yielded significant results in that outcome area. The review emphasizes the specific benefits of exercise for individuals diagnosed with SMIs.

Significant anxiety reduction was also seen across the studies reviewed, which aligns with research conducted by Vancampfort et al. (2011) (Holley et al., 2011). Their research examined the effects of yoga and aerobic exercise on individuals diagnosed with schizophrenia. A statistically significant improvement in subjective well-being was also indicated by both exercise groups compared to the control group and no significant difference between the two exercise groups was noted (Vancampfort et al., 2011).

Because anxiety and stress contribute to increased symptoms in individuals diagnosed with SMIs, it is extremely valuable that both can be mediated by exercise in this population.

Most research on the connections between exercise and mental health consists of quantitative studies that allow for objective measurement of improvements in a variety of outcome areas. Yet it is also important to consider how the individuals impacted most by the research feel about the interventions being implemented.

A qualitative study conducted by David Careless and Andrew Sparkes examined how three individuals diagnosed with SMIs view physical activity in terms of their
quality of life and treatment (2008). The themes that emerged from this research included happy childhood memories of physical activity - playing sports and games with friends, social support, and distraction from symptoms. All of the participants were coping with SMIs, yet all mentioned that participating in physical activity now brought up happy memories, allowed them to feel supported by peers and staff, and allowed them to spend time not thinking about their symptoms or problems (Carless & Sparkes, 2008).

Exercise yields many benefits, physiological and psychological, for individuals diagnosed with SMIs. Increased participation in physical activity reduces the risk of disease development and early mortality, which is especially important for individuals diagnosed with SMIs.

**Feasibility of Exercise for Individuals Diagnosed with SMIs**

Though the importance of individuals diagnosed with SMIs participating in exercise is accepted, it is important to consider whether or not these individuals are capable of participating in physical activity. An important area of the literature addresses the actual feasibility of this population participating in exercise programs and the factors that promote adherence to such programs.

In reviewing the literature several studies explored the feasibility of exercise programs for individuals diagnosed with SMI. Three studies in particular boasted relatively high adherence rates, between 64% and 82%. The exercise routines focused mostly on walking sessions though one study incorporated strength training with a personal trainer as well. In all three studies the adherence rates indicate that the individuals participating in the studies were capable of participating in exercise routines
on a regular basis.

One of these studies was conducted with eight participants between the ages of 33 and 62 (mean of 45) recruited from a residential psychiatric facility. All participants were diagnosed with chronic schizophrenia and attended one 30-minute walking session and one 30-minute aerobic exercise session weekly for a period of 24 weeks. The aerobic exercise sessions were conducted by a personal trainer and participants were given explicit direction on how to complete the required exercises. The walking sessions were led by residential staff members and took place in the neighborhood surrounding the psychiatric facility. This study was designed, primarily, to determine if chronically mentally ill individuals could tolerate this amount of physical activity. Adherence rates to the program were fairly high at 73% for the exercise sessions and 83% for the walking sessions, even though the number of participants was small. Despite this study being small it indicates that it is possible for even chronically ill individuals diagnosed with a psychotic disorder like schizophrenia can successfully participate in physical activity on a twice-weekly basis (Dodd, Duffy, Stewart, Impey, & Taylor, 2011).

Dodd et al. attributed the relatively high adherence rates to several factors (2011). They first credited the trainer who taught participants how to complete the exercises effectively. This likely allowed the individuals to feel more confident and competent during exercise sessions, which led to few drop-outs/missed sessions. The researchers also credited the involvement of the residential staff members. Because they led the walking group sessions they were able to encourage participants on a daily basis to participate and participants also did not have to leave the premises to meet for the
walking group (Dodd et al., 2011).

It was also discussed that the small group atmosphere led to positive social interactions and peer support throughout the intervention, which may have also contributed to adherence rates. This hypothesis aligns with existing literature that has indicated opportunities for peer support and social interactions are likely to increase attendance (Dodd et al., 2011). Carless and Sparkes (2008) also saw the role of peers and social support emerge during their qualitative study investigating how individuals diagnosed with serious mental health issues feel about physical activity groups (Carless & Sparkes, 2008).

Another study was conducted with 64 obese or overweight Thai participants diagnosed with schizophrenia. Over the course of 12 weeks participants were required to attend five one-hour sessions that involved walking and motivational interviewing. Participants were required to complete walking sessions on their own as well. Pedometers were used in both the group and independent walking sessions to measure participant progress. The purpose of this study was to test the feasibility of an exercise program designed for individuals diagnosed with a SMI. A 64% adherence rate was noted; as in Dodd et al.’s study, Methapatara and Srisurapanont’s results indicate that despite challenging symptoms, individuals diagnosed with SMIs are able to participate in physical activity (Methapatara & Srisurapanont, 2011).

Researchers speculated that the pedometers were helpful to group member adherence but that a walking group outside of the sessions, allowing for more peer support, might have bolstered the number of consistent participants (Methapatara &
Srisurapanont, 2011).

As in the previous studies reviewed in this section, Warren et al.’s study was designed to test the feasibility of an exercise program for individuals diagnosed with a SMI. The program was built around an exercise program based on an end-goal of group members participating in a 5K event. Over the course of ten weeks 17 participants met three times/week to walk/jog together and also attended a weekly healthy behaviors educational session. This study showed an 82% (14/17) adherence rate to the program (Warren et al., 2011).

The authors speculated that the adherence rate was due to motivation associated with the end-goal of the 5K and the overall friendly and supportive program atmosphere. Because of the friendly and supportive atmosphere, there were ample opportunities for socializing which may also have contributed to the success of this intervention. Despite the barriers and difficulties associated with exercise for individuals diagnosed with SMIs, based on the results of this study, individuals diagnosed with a SMI are capable of participating in exercise regimens given adequate supports and encouragement (Warren et al., 2011).

These three interventions were conducted largely with an inpatient population though Warren et al.’s (2012) study also included outpatient participants and Methapatara and Srisurapanont’s (2011) study worked with inpatients due to me discharged in one to two weeks who were identified as only “mildly” ill. No gender or age differences in results were noted. These interventions share two main commonalities. The results indicate that individuals diagnosed with SMIs are capable of, and will participate in
physical activity and that researchers are highly focused on motivational strategies in these exercise interventions. Because so many individuals diagnosed with SMIs struggle to engage in and maintain exercise behaviors, interventions have focused on ways program designs can increase motivation and maintain positive and healthy behaviors.

**Barriers to Exercise**

Despite evidence that individuals diagnosed with SMIs are capable of participating in regular exercise, it can be difficult for many people to commit to regular physical activity. Research has been conducted to determine the specific barriers hindering different populations from participating in regular physical activity. This section will review the literature related to barriers to regular exercise for three different groups: 1) members of the general population; 2) the elderly and disabled who face challenges similar to individuals diagnosed with SMIs; and 3) individuals diagnosed with SMIs. The literature reviewed focuses heavily on the barriers identified by the general population, as these barriers are applicable to everyone.

1. *General Population*

Members of the general population often establish weight loss or health goals related to exercise and yet find themselves having difficulty adhering to their exercise regimens. Research has focused on identifying the barriers to exercise in the general population and exploring the ways in which programs and environments can be altered to support people in participating in more regular physical exercise. For example, not having free time available for exercise nor access to facilities, or areas to exercise, are two very common barriers (Sherwood & Jeffery, 2000).
People lead busy lives and it can be very difficult to carve out time for self-care and exercise in particular. Gym memberships can also be very expensive and depending on where individuals reside, walking or running outside during the times of day one has free, may not be wise. There are no easy solutions offered to combat these barriers but some creative suggestions are reviewed. Specifically, incorporating exercise into family or social time allows an individual to spend time with family and friends while engaging in a healthy behavior (Sherwood & Jeffery, 2000).

Many people struggle with motivation regarding physical activity and/or lack a sense of self-efficacy related to exercise. Researchers suggest helping individuals struggling with motivation to identify the benefit of exercise that is most salient to them. Exercise can help an individual improve psychologically as well as physically but different individuals will feel more strongly about some improvements over others. Helping individuals identify the benefit of exercise in which they are most interested and then focus on and leverage this to inspire participation in physical activity has been successful (Sherwood & Jeffery, 2000).

While it may seem simplistic, addressing the barriers to exercise or helping an individual see past those impediments in favor of focusing on a more important value or goal successfully increases regular physical activity in the lives of those people (Sherwood & Jeffery, 2000).

Another area that seems relatively simple but that shows great promise in the literature is positive thinking and the impact of one’s mindset on his or her exercise behavior. Glazebrook and Brawley examined the impact of positive and negative
thinking on maintaining exercise regimens (2011). They determined, using statistical analyses, that individuals reporting higher levels of positive thinking also reported higher exercise frequency, endorsed more self-regulation skills, and indicated a higher capacity for adaptation. According to their analysis, one’s mindset does make a difference: individuals who tend towards more positive thinking are more likely to maintain their exercise regimens (Glazebrook & Brawley, 2011).

Just as positive thinking has been shown to improve or maintain exercise behavior, an individual’s affective response to exercise is also an important factor in determining whether or not that individual will continue to exercise (Williams, 2008). Research has shown that individuals will control whatever they can during an exercise regimen to maximize pleasure and minimize displeasure and that doing so allows them to experience a positive affective response (Williams, 2008; Cabanac & Lablanc, 1983; Ekkekakis, Backhouse, Gray, & Lind, 2008).

Based on this finding, Williams discusses the value of self-paced exercise. Though self-paced exercise may not result in the burning of as many calories as compared to exercise where a specific pace is imposed, based on previous research regarding pleasure and control in the setting of exercise, individuals may be more likely to pursue and maintain an exercise regimen if they are given control over the pace. According to hedonic theory, people minimize pain, maximize pleasure, and therefore experience positive affect as a result and are more likely to pursue whatever yielded that, in the future. This is something to consider during both exercise promotions and exercise interventions themselves (Williams, 2008).
It is necessary to strike a balance between intensity and pleasure if individuals want to see the health-related results of exercise. It is especially important at the outset when individuals are being asked to begin forming these habits and are participating for the first time. According to Williams, it may be very beneficial to allow them to set their own exercise pace/intensity, in order to develop and maintain a positive relationship with exercise that will keep them on the right track (Williams, 2008).

The barriers reviewed thus far are those encountered by individuals in the general population who would like to participate in regular exercise but who find it difficult to navigate the responsibilities in their lives and carve out time for exercise, not necessarily an enjoyable task.

2. Disabled and Elderly Populations

Individuals with physical disabilities also face a myriad of challenges when it comes to engaging in healthy behaviors such as exercise. Their challenges mirror those faced by members of the geriatric population and by those diagnosed with SMI. It can be difficult for members of all of these groups to find the motivation necessary to engage in physical activity. It can also be difficult for all of these individuals to physically accomplish the tasks of exercise given their symptoms and conditions. Medications can also complicate the picture and make engaging in physical activity even more challenging (Kosma, Cardinal, & Rintala, 2002; Beebe & Smith, 2010).

One study published on the topic of increasing physical activity among individuals with physical disabilities discussed several ways to promote exercise programs among this population. After reviewing several programs the authors suggest
that this population would be more likely to participate in exercise groups that are tailored to their own competencies and abilities and thus education around local resources and opportunities available to these individuals would be beneficial. The authors speculate, based on the data available, that awareness of opportunities is one of the most critical reasons that individuals with disabilities are not participating in more physical activities. It was also discussed that it is critical to educate individuals about the benefits of exercise. It is easy to take for granted that “everyone” knows that exercise is good, but it is important that individuals understand how exercise can benefit them specifically (Kosma et al., 2002).

Another study adapted an intervention initially designed to increase participation in physical activity among elderly individuals. Researchers note, specifically, that the elderly population as well as individuals diagnosed with SMIs face similar challenges when it comes to accessing motivation to participate in exercise. Cognitive difficulties, a lack of understanding around the benefits of exercise, and low motivation were among the shared challenges discussed. Cognition may not immediately seem relevant to exercise and motivation but it is necessary to goal-setting, planning, and execution. Awareness of the benefits of exercise is also important to motivation, as without this knowledge, individuals may not understand the importance of motivating themselves towards this behavior (Beebe & Smith, 2010).

3. Individuals Diagnosed with SMIs

An article published in 2012 examined the additional barriers experienced by individuals diagnosed with SMI that make participating in regular physical activity even
more challenging (Moriarty, Jolley, Callanan, & Garety, 2012). The results of this study brought to light additional barriers unique to individuals diagnosed with SMIs including: symptoms, anxiety, depression, cognitive functioning, internalized stigma, insight, and illness perceptions. Internalized stigma refers to feelings or experiences of discrimination, alienation, social withdrawal, and stereotypes. Using multiple regression analysis, the authors discovered that internalized stigma is significantly associated with lower activity levels. Symptoms such as low motivation, restricted thinking and affect, distress resulting from hallucinations and/or delusions, and a lack of social support also contribute to lower levels of physical activity. These together with internalized stigma were shown to account for 42% of the variance in activity seen in the sample of 50 individuals diagnosed with SMIs (Moriarty et al., 2012).

Therefore, in addition to the barriers to exercise experienced by members of the general population - feeling as if there is not enough time in the day, not feeling well physically, feeling unable to successfully participate in exercise - individuals diagnosed with SMIs also face worries about what others will think of them or how they will treat them. The authors suggest that cognitive behavioral techniques should be incorporated into treatment to help these individuals cope with these negative feelings and fears that prevent them from taking care of themselves physically (Moriarty et al., 2012).

In summary, the barriers specific to individuals diagnosed with SMI as well as those experienced by members of the general population and populations facing challenges similar to those diagnosed with SMIs must be considered when developing exercise interventions or health promotion interventions targeting this group.
Health Promotion Interventions

The previous section discussed barriers to exercise for members of the general population, the elderly, and individuals diagnosed with SMIs. This section will discuss interventions that took these barriers into consideration and were designed to promote healthy behaviors, largely through education and addressing issues of motivation. The literature reviewed here examines the effectiveness of programs in promoting future participation in healthy behaviors for 1) members of the general population and 2) the elderly and those diagnosed with SMIs.

There have been many approaches employed to promote healthy behaviors among reluctant populations. When it comes to healthy behaviors, especially exercise, even the general population is considered to be reluctant (Sherwood & Jeffery, 2000). Individuals with physical disabilities, the elderly, and people diagnosed with mental illnesses also experience much difficulty participating in healthy behavior.

1. General Population

Martins and McNeil (2009) conducted a critical review, examining 37 studies that employed motivational interviewing techniques to promote healthy behaviors in the general population. Motivational Interviewing is defined as “a directive and client-centered counseling style”; the idea is that counselors work with individuals to help the individuals come to their own conclusions regarding areas of their lives in which they might want to see change and how they might behave to bring about such changes (Rollnick & Miller, 1995). The interview process allows individuals to explore their own ambivalence towards exercise and by way of this process they are able to identify their
own priorities and the role their behaviors and decisions play in creating positive change in areas of their lives, important to them. Motivational Interviewing is frequently used in conjunction with cognitive-behavioral therapy, which aids individuals in examining and reframing their thought processes in more helpful or productive ways, related to their goals.

The studies reviewed by Martins and McNeil focused on three domains of healthy behaviors: oral care, diabetes management, and diet and exercise. The results of the review indicate that Motivational Interviewing techniques can be used effectively in all three of these domains (Martins & McNeil, 2009).

Of the 37 studies reviewed, 24 focused on using Motivational Interviewing techniques to promote improvements in diet and exercise. Participants reported an increase in self-efficacy, an increase in physical activity, decreased consumption of calories, and increased fruit and vegetable consumption as a result of the interventions based on Motivational Interviewing techniques aiming at promoting healthy behaviors in the domain of diet and exercise (Martins & McNeil, 2009).

Significant diversity in terms of intervention design was noted. In terms of duration alone, interventions lasted anywhere from four weeks to 52 weeks. The mode of intervention delivery also varied significantly as some studies communicated using the phone or Internet and others, in person. Despite these differences, overall, Motivational Interviewing successfully promoted health behaviors in the domain of diet and exercise in the general population. When compared to “traditional help-giving,” Motivational Interviewing was found to be more effective, 75% of the time (Martins & McNeil, 2009).
Self-management strategies such as goal-setting, self-talk and self-monitoring, fall under the umbrella of Cognitive Behavioral Therapy but look very different and may work for some people, either instead of, or in conjunction with, other techniques such as Motivational Interviewing.

The success of these skills in promoting physical activity among college students in the general population was evaluated via a study titled Project GRAD - Graduate Ready for Activity Daily. Two hundred and fifty-six college students participated. In-person lecture style sessions, small group discussion sessions, telephone sessions, and mailings were all used to educate and promote understanding and application of the skills, and then to cue continued use of the skills and participation in physical activity. Although no difference was seen in the men’s cohort, the skills taught during the intervention significantly impacted physical activity participation among the women throughout the intervention (Saelens et al., 2000)

Few explanations were offered to account for the gender difference. Researchers speculated that if men use skills like self-talk more frequently than women, this difference could account for the variability in intervention effects between the two groups. Despite the gender difference noted, it seems that an intervention focused on educating participants about skills they can apply to promote their own adherence to an exercise regimen is a promising approach to promoting healthy behaviors among the general population (Saelens et al., 2000).

The use of imagery is another technique that has been examined in the general population with the aim to increase physical activity participation. Exercise motivation,
self-efficacy, motivation, and behavior were all measured at baseline and following an intervention. Fifty participants were randomized to a manipulation of an implementation intention group or to an imagery group. Both groups ultimately yielded positive results, with the imagery group increasing their physical activity level more, though not to a significant degree. There were no differences between the groups regarding exercise self-efficacy or motivation. This study indicates that while both interventions were successful, it is possible that imagery can be used successfully in the health promotion context (Andersson & Moss, 2011).

2. The Elderly and Individuals Diagnosed with SMIs

Since it is accepted that individuals diagnosed with SMI and members of the geriatric population face similar challenges when it comes to participation in exercise programs it makes sense that interventions developed for one population may inform interventions for the other. Specifically, information may be gleaned regarding acceptability to the population, feasibility of implementation, and the potential difficulties that particular interventions may present to these populations. Both groups struggle with symptoms and a lack of motivation, which interfere with participation either directly or indirectly by impacting one’s desire to attend sessions or fear regarding exacerbation of symptoms (Beebe & Smith, 2010).

In discussing the ways in which programs can increase adherence to exercise regimens in the geriatric population, researchers focus on practicality. They recommend concentrating on activities of daily living that involve a physical activity component and encourage individuals to spend time completing those activities on a regular basis. Such
activities include climbing stairs and walking from one location to another, rather than taking transportation of some kind. They also emphasize the importance of recognizing the desires of the population - some people prefer to work out alone rather than in a community setting, so programs that offer instructions on how one can safely engage in physical activity individually, have been successful. The Walk, Address, Learn, and Cue (WALC) intervention may have been successful due to its incorporation of daily living activities that can offer physical activity opportunities (Brawley et al., 2003).

Beebe and Smith (2010) conducted a study to test the effectiveness of an intervention with individuals diagnosed with schizophrenia spectrum disorders. The WALC intervention had been originally developed for use with the elderly population to promote engagement in regular physical activity. The intervention was adapted slightly for the individuals diagnosed with schizophrenia spectrum disorders. Specifically it focused on addressing the cognitive impairments faced by individuals diagnosed with schizophrenia spectrum disorders. The goal of the intervention was to increase physical activity by taking into account these cognitive deficits, especially in the areas of attention and executive functioning. Through education about the benefits of exercise and how to exercise safely, goal-setting, and the development of organizational skills, the WALC intervention aimed to promote physical activity among individuals diagnosed with schizophrenia spectrum disorders. The results of the study indicate that the intervention was successful. Almost half of the group (n=17) attended at least three of the four sessions held (Beebe & Smith, 2010).

The attendance rate was attributed to, in part, the short duration of the
intervention, but also to the “cue” section of the intervention. This portion of the intervention emphasized tangible reminders and strategies to help individuals stay in touch with their goals and stay organized around achieving them (Beebe & Smith, 2010).

Interventions promoting healthy behaviors designed specifically for individuals with SMI have also been investigated. One study conducted with 47 inpatients diagnosed with SMIs examined the effectiveness of a modular behavioral intervention program. The behavioral intervention program implemented, Solutions for Wellness, consisted of eight modules lasting 30 minutes each, and was completed in four weeks. The modules covered topics such as nutrition, exercise, appetite, and food choices via lectures by trained professionals, written materials, and worksheets. The results were promising. Only 14 of the 47 inpatients gained weight during the intervention, and the rest of the participants either maintained or lost weight during this time. No follow-up was conducted to determine if these effects held once inpatients moved to a lower level of care, however (Bushe, McNamara, Haley, McCrossan, & Devitt, 2008).

In a meta-analysis published in 2012, researchers examined 42 studies reporting on health behavior interventions implemented with individuals diagnosed with mental illnesses. Of the studies considered, most were focused on weight management, others emphasized physical activity, smoking cessation, nutrition, and alcohol misuse (Happell, Davies, & Scott, 2012).

Seven of the 42 studies examined aimed to improve physical fitness in participants. The studies differed in terms of intervention design and assessments used. An improvement in the distance walked by participants was noted in two studies and two
studies also reported a significant decrease in body fat when baseline data was compared to post-intervention data. One study also indicated a significant improvement in aerobic capacity for participants. Few details were reported regarding the intervention designs but this review of studies aiming to increase physical fitness in people diagnosed with mental illnesses does indicate that improvements are possible and that individuals can be engaged to attend and complete such programs (Happell, et al., 2012).

An intervention based on skills such as goal-setting, visualization, and self-talk was also successfully implemented with adolescent males receiving treatment at a residential psychiatric facility. The goal of the intervention was to reduce cigarette smoking in this population. The intervention took place over the course of 12 weeks, and though the sample size was small (n=9), all participants reduced their daily cigarette intake by an average of 2.23 cigarettes, over the course of the program (Casallas, 2004). This was a statistically significant finding but perhaps more importantly, a clinically significant improvement. Participants reported smoking an average of eight cigarettes daily at the outset of the program and overall reduced that number to around six cigarettes daily over the course of this 12-week curriculum. Though an overall decrease of two cigarettes, daily, may not seem important, the curriculum used brought about movement/change in a positive direction. This movement in a positive direction is clinically relevant. Casallas (2004) also noted the reduction to be clinically significant as the overall impact of cigarettes on the body is such that a reduction – especially when dealing with smaller numbers – is extremely valuable.

A common thread that runs through the interventions described in this section is
the combination of skills and goal identification involved. Identifying goals and supporting participants as they build and maintain connections to these goals has proven to help individuals move towards positive change. Likewise, providing individuals with tools they can understand and apply easily helps them take action to move towards that desired change.

**The Transtheoretical Model**

While several theories have been used to inform the interventions reviewed here, the most commonly employed framework is the Transtheoretical Model (Prochaska & DiClimente, 1986). Not only does this model offer a general conceptualization of how behavior change occurs but it has also been examined specifically for use in physical activity interventions for individuals diagnosed with mental illnesses.

The Transtheoretical Model assesses individuals based on their level of “readiness for change” (Prochaska & DiClimente, 1986). The model asserts five stages: pre-contemplation, contemplation, preparation, action, and maintenance. Each of those stages is also associated with suggested cognitive behavioral techniques to support the individual at that stage and help them to progress through the remaining stages (Prochaska & DiClimente, 1986; Gorczynski, Faulkner, Greening, & Cohn, 2010). When the effectiveness of this model applied to interventions was examined in the general population, the interventions based on this model were significantly more successful than interventions not based on this model (Gorczynski et al., 2010; Spencer, Adams, Malone, Roy, & Yost, 2006).

The same type of study was then carried out with individuals diagnosed with SMI
and once again the intervention based on this model was effective. The data showed a linear change in self-efficacy, benefits, and barriers, as participants progressed through the stages of change. Self-efficacy and benefits increased while perceived and objective barriers reported decreased. The Transtheoretical Model developed out of an interest in integrating several ideas regarding behavior change, specifically those that were socially and biologically-based. This model allows for individuals to address a variety of problems from several different perspectives, accounting for social and biological strengths and challenges along the way (Gorczynski et al., 2010).

The Transtheoretical Model emphasizes the importance of helping individuals develop skills so that they may move forward and access the next stage on the path towards positive change. It is not surprising that this model was successful with individuals diagnosed with SMI as many of the more successful health promotion interventions and exercise interventions are based on skills- building and meeting clients, “where they are at,” in terms of such skills and their willingness to engage in a behavior. This model provides the theoretical foundation for the intervention described here.

**Skills Promoting Behavior Change**

Though it has been established that teaching tangible skills to individuals diagnosed with SMI is a good strategy to employ when promoting and maintaining healthy behaviors, it is important that the skills taught are those that are both useful and feasible for the target population to learn and apply. Sport Psychology, in fact, espouses four main types of skills that are considered to be helpful to performers and athletes. These skills are very similar in nature to those discussed in the Cognitive-Behavioral
research and include goal-setting, visualization, self-talk, and arousal regulation. These four types of skills, working together, have been shown to help individuals optimize their performance in their chosen areas of focus.

Self-talk is defined many different ways in the psychological literature, but, for the purpose of this piece, will refer to one’s internal dialogue. Self-talk is a skill often emphasized but not directly taught during exercise interventions. Trainers encourage their participants to tell themselves they “can do it,” but no education or training has been documented around how self-talk can be used for motivation during, and outside of, exercise. Though self-talk may seem like a relatively straightforward concept, there are many qualities of self-talk to consider. For example, self-talk can be positive or negative. Negative self-talk has been shown in the sport psychology literature to contribute to poor performances while positive self-talk has been shown to improve performance (Hardy, 2005). These findings align with the study showing that individuals who think more positively are more likely to maintain healthy behaviors such as exercise as compared to individuals who tend to think more negatively (Glazebrook & Brawley, 2011).

Self-talk also varies from person to person in terms of how aware the individual is of what they are choosing to say to themselves. Often self-talk, especially negative self-talk seems to be automatic, as if the individual says something to him or herself without the ability to change it. Much of the work around using self-talk productively involves increasing an individual’s awareness of their self-talk and helping them to, intentionally use the technique to reframe negative thoughts and motivate themselves towards an identified goal. This is a core concept in Cognitive-Behavioral Therapy and there is a
wide range of literature discussing this technique, its development and use. (Hardy, 2006).

Uses of self-talk will also vary depending on the person and situation. Some individuals use self-talk to motivate themselves, and some use it to calm themselves, while others use it to evaluate themselves. When working with individuals around self-talk, it is important to discuss all of these facets. Self-talk is a concept that may seem simple but its effective implementation hinges on an individual’s understanding of it as a technique that is used intentionally to provide both information and motivation (Hardy, 2006).

Goal-setting is another tangible skill that has been used successfully in health promotion interventions. Given the rate at which obesity is increasing in the US, considerable research has been conducted around interventions aiming to increase healthy behaviors, such as exercise and healthy eating, which combat obesity. Goal-setting has been shown to improve productivity in the workplace by helping people break down bigger projects into smaller steps and to approach those projects more efficiently (Shilts, Horowitz, & Townsend, 2004).

A critical review was conducted to examine the effectiveness of goal-setting in studies aiming to promote health behaviors, among adults in the general population. Thirteen studies were found to examine the effectiveness of goal-setting for the purpose of changing exercise and eating behaviors. Of those thirteen studies, eight indicated a statistically significant positive effect on eating behaviors or exercise behaviors, but specific effect sizes and other statistics were not provided. Based on this review it is
recommended that healthy behavior change interventions include education around goal-setting and work to help participants set goals that are meaningful to them (Shilts et al., 2004).

Visualization techniques have also been shown to effectively improve exercise behavior for members of the general population (Andersson & Moss, 2010). Though visualization techniques can be challenging to teach, the effort is worthwhile given the improvement shown in the area of exercise engagement in the general population. While it has not been studied, it is likely, based on the success of similar skills in both the general and mentally ill populations, that visualization techniques may aid in the promotion of healthy behaviors among individuals diagnosed with SMIs.

While all of these skills have successfully been incorporated into health promotion interventions, they have also all been successfully taught to individuals diagnosed with SMIs. Though they were not taught to this population in the sole context of health promotion, the fact that they were taught effectively speaks to the feasibility of applying these skills with individuals diagnosed with SMIs.

A curriculum emphasizing self-talk and arousal regulation aimed to teach individuals different strategies for coping with hallucinations and delusions. Though the population was different, the approach and model of the curriculum was similar to Casalla’s smoking cessation program – short term and skills based. The curriculum proved successful as the skills were taught to, and used by, a group of individuals diagnosed with psychotic disorders (Goldberg et al., 2007). Individuals completed self-report scales related to their symptomatology pre and post intervention. Their responses
post intervention indicated fewer symptom endorsements following the intervention when compared to their responses prior to the intervention.

**Summary**

A thorough review of the literature yields no information regarding an intervention designed to promote exercise among individuals diagnosed with SMIs using skills that have been successfully taught to, and applied by, this population in other contexts (e.g., symptom management, smoking cessation). Given the importance of exercise to this population, it is essential that research focus on increasing exercise behaviors using skills that can be applied by the individuals as they move toward recovery.

**Hypotheses**

Individuals diagnosed with SMIs are at an increased risk of disease and early mortality (Viron et al. 2012). The literature indicates that these individuals are physically able to and will participate in physical activity despite difficult symptoms but that issues of motivation hinder their regular participation (Beebe & Smith, 2010; Viron et al., 2012, van Os & Kapur 2009). The research also reflects the success of skills-based interventions designed for this population, in the context of symptom-management and smoking cessation. As such, we hypothesized that the skills-based curriculum I developed to promote physical activity among individuals diagnosed with SMIs will yield the following results:

**Hypothesis 1:** Individuals would report an increase in physical activity following the completion of the intervention, as measured by their responses
on the RAPA.

Hypothesis 2: Individuals would report an increase in mental skills knowledge following the completion of the intervention, as measured by their responses to the Semi-Structured Interview.

Hypothesis 3: Individuals would report an increase in their quality of life as measured by their responses on the WHO8 questionnaire.
METHODS

Overview

The intervention conducted consisted of a six-week education and skills-based curriculum designed to promote exercise with a group of individuals diagnosed with SMIs. All procedures were approved by the Institutional Review Boards (IRB) of Beth Israel Deaconess Medical Center and the Massachusetts Department of Mental Health. The Boston University IRB ceded authority to the Beth Israel Deaconess Medical Center IRB, as the study was resourced by and implemented on that institution’s property.

The Stage Model of Behavior Therapies was employed to guide the study’s design. This model indicates that once a curriculum based on relevant research is developed, researchers must then conduct a feasibility study; in the model’s language, a Stage 1b Pilot Trial. The model stipulates that an intervention can be deemed successful if it is acceptable to the target audience, as evidenced by attendance rates, and there is significant improvement in at least one outcome area (Rounsaville, Carroll, & Onken, 2001).

3.1 Recruitment

Participants were recruited at Massachusetts Mental Health Center (MMHC), an outpatient clinic serving individuals diagnosed with SMIs, via printed fliers and spoken announcements made during other health and wellness related programming. The fliers indicated the purpose of the study – to determine if teaching mental skills such as goal-setting, self-talk, visualization, and energy regulation positively impacts the physical activity levels of participants – as well as the potential benefits of participating, eligibility
requirements, and how to get in touch with me if they were interested in participating. A sample flier can be found in Appendix B. The announcements made during other wellness programs communicated the same information. The script used for these announcements can be found in Appendix C.

3.2 Participants

To be eligible participants had to carry a diagnosis of schizophrenia or a schizophrenia related disorder (e.g., Psychosis NOS, Schizophreniform Disroder, Schizoaffective Disorder), be between 18 and 64 years of age and be competent to give informed consent to participate in the study, with competence being defined as a score of at least 80 on the Wide Range Achievement Test, 4th Edition (WRAT4) Reading and Sentence Comprehension Subtests (Wilkinson & Robertson, 2006). Participants also had to be able to transport themselves or arrange their own transportation to and from the sessions. Each participant received $10 at each data collection point (there were four) to compensate them for their time, and had the opportunity to earn a $20 bonus for completion of all four assessment sessions. As such, participants had the potential to earn $60 over the course of this study.

Fourteen individuals were referred to the study, 11 were screened, and ten enrolled. Of the ten participants, eight were male and two were female and they ranged in age from 20 to 44 years old, the average age being 27. Eight of the ten participants were younger than 30. Eight participants carried Schizophrenia diagnoses while the remaining two were diagnosed with Psychosis NOS. Six participants identified as Black or African American, three identified as White or Caucasian, and one identified as Indian.
Tables 14 and 15 in Appendix G also present this data.

**Measures**

The following measures were used to answer the research questions asked: the Rapid Assessment of Physical Activity (RAPA) (Topolski et al., 2006); and the WHO8:EUROHIS Quality of Life Scale (POWER, 2003). Attendance records, to track retention/attrition rates, and a semi-structured interview created specifically for this study also contributed to the data. See Appendix A for the semi-structured interview guide and Appendix E for additional information about the RAPA and WHO8.

Participants completed the RAPA (Topolski et al., 2006), WHO8: EUROHIS Quality of Life Scale (POWER, 2003), and the semi-structured interview at baseline, immediately following the last intervention session, and at six and twelve weeks after the last intervention session. Participants’ clinicians completed the Clinical Global Impression (Guy (Ed.), 1976) scale or spoke directly with me, to provide this information, at all four assessment points as well to provide further information regarding the participants’ levels of functioning.

The RAPA is a checklist that contains nine items and inquires about an individual’s level of activity during the previous week. Pictures illustrating examples of activities representative of different activity levels are included to ensure that the participant has a good understanding of activities representative of each level of activity. The RAPA was originally designed to assess the older adult population but given the overlap in challenges faced by the older adult population and individuals diagnosed with SMIs, the RAPA has also been deemed appropriate for assessing the physical activity
levels of individuals diagnosed with SMIs (Topolski et al., 2006). The RAPA has been assessed to have adequate convergent validity, good criterion validity, and yields an intraclass correlation coefficient (ICC) greater than 0.75, indicating, "excellent" test-retest reliability (Topolski et al., 2006; Mehta, MacDermid, Richardson, MacIntyre, & Grewal, 2015). The Spanish version of this measure also yields a test-retest reliability coefficient of 0.65 (Vegas-Lopez, Chavez, Farr, & Ainsworth, 2014).

Participants completed the RAPA checklist independently and were then interviewed based on their responses. This method afforded me the opportunity to ask clarifying questions and to collect details specific to each response. For instance if an individual shared that he or she participated in a weekly exercise class, details regarding the time and place of that class were collected so the existence of that class could be confirmed. It also ensured that participant’s accurately completed the checklist in accordance with the physical activity they participated in, and protected against inaccurate responses based on misunderstandings of the checklist and how to complete it.

The World Health Organization’s European Health Interview Survey Quality of Life Scale (WHO8: EUROHIS Quality of Life Scale) is an eight item multiple choice questionnaire, derived from the WHOQOL-BREF, that presents questions pertaining to different areas of life with the goal of determining the degree to which participants are satisfied with these areas (POWER, 2003). It has been validated for use with individuals facing a wide range of physical and mental health conditions (Murphy, Herrman, Hawthorne, Pinzone, & Evert, 2000; da Rocha, Power, Bushnell, and Fleck, 2012). It has good internal consistency as evidenced by a Cronbach’s alpha of .78 and good
convergent validity with its parent questionnaire, particularly on items related to the physical domain as the correlation coefficient for those is 0.73.

A semi-structured interview was also used to gather information about the extent to which participants understood and were able to apply the mental skills taught during the intervention. The semi-structured interview format has been used successfully with individuals diagnosed with SMIs (Carless & Sparkes, 2008). These interviews consisted of straightforward questions regarding mental skills such as, “What do you know about visualization?” and “If a friend wanted to go for a walk every morning but he was having trouble reaching this goal, what advice would you give him?” A complete copy of this interview guide can be found in Appendix A.

The Clinical Global Impressions Scale was used to estimate the participants’ levels of symptom severity throughout the intervention. This is a measure that has been criticized for the lack of research around its reliability and it has been cautioned that it should not be used in instances where the purpose is to detect change in a participants’ clinician. It was also noted, however, that the first item on the scale is still beneficial for gaging where a participant falls in terms of symptom severity. For the purpose of this study, only the first item was used. Clinicians, experienced in working with this population, identified the number corresponding with their clients’ levels of symptom severity at the 4 different assessment points.

During the last assessment session, participants were also asked to complete The Helping Alliance Questionnaire (Luborsky et al., 1996) and the Client Satisfaction Questionnaire (Larsen, Attkisson, Hargreaves, & Nguyen, 1979) to shed light on how the
participants viewed both the intervention leader and the intervention, itself.

The Helping Alliance Questionnaire is a 19 item Likert Scale questionnaire that asks participants about their relationship with the therapist. Scores can range from 19–114. It has shown adequate internal consistency, with a Cronbach’s alpha of .79 and good convergent validity ranging from .59 to .69 (Luborsky et al., 1996). Test-retest reliability coefficients were reported to range between .90 and .93 (Luborsky et al., 1996).

The Consumer Satisfaction Questionnaire is an 8-item Likert Scale questionnaire focused on consumer satisfaction with an intervention. It has good internal consistency, yielding a Cronbach’s alpha of .83 (Larsen, Attkisson, Hargreaves, & Nguyen, 1979). Test-retest reliability was not reported for this measure.

In addition to the specific measures and interviews discussed above, attendance records were collected. Attendance records simply reflect the individuals in attendance at each of the six sessions. All participants were welcomed to each session, regardless of their attendance records. It was important to collect this data as researchers and providers who may consider replicating or implementing this intervention will want to know the rates of attrition/adherence. It is also an essential aspect of the pilot study, according to the Stage Model of Behavioral Therapies (Rounsaville, Carroll, & Onken, 2001).

3.3 Skills Based Intervention

The curriculum focused on mental skills (goal-setting, self-talk, visualization, and arousal regulation) and general education around the benefits of exercise and exercise program and regimen resources. Specifically, information about exercise programs,
classes, and groups was shared with participants as well as information for exercising independently – safe walking routes, how to measure your intensity, etc. Each weekly session lasted one hour and sessions were conducted using PowerPoint presentations, handouts, worksheets, in-session activities, and group discussions. An outline of the intervention session objectives and activities can be found in Appendix D.

Attention was also paid to the importance of capturing the attention of my audience and reducing barriers to learning. The group was designed to be interactive, healthy snacks were provided, and the activities aimed to be fun. Healthy snacks were also provided during each group session. Fruit, vegetables, and low sodium/low fat snacks were made available as the group took place at 3:00pm.

*Intervention Duration*

The intervention was developed to last for six weeks for two reasons. First, the skills targeted in this curriculum are relatively simple and have been successfully taught to individuals diagnosed with SMIs during interventions of similar durations (six to eight weeks) (Goldberg et al., 2007).

### 3.4 Data Analysis

**A. Do participants show an increase in physical activity?**

In order to assess participants’ level of physical activity following this intervention, data was collected at baseline, immediately following the last intervention session and at six and twelve weeks following the last intervention session. The RAPA is a tool that requires individuals to consider various levels of physical activity and endorse whether or not they have engaged in activities featured at each level in the previous week.
The administration was tape recorded to preserve the exact words used by the participants in describing their activities to ensure accurate completion of the measure.

The RAPA score provided quantitative data but the qualitative data gathered via researcher follow-up and clarifying questions was transcribed and reviewed to ensure that the responses on the measure matched the verbal descriptions provided by participants. Systematic open-ended thematic content analysis was also conducted to identify any themes that were present in this data (Schreier, 2012). This is a validated process used to analyze qualitative data that allows researchers to identify themes present in data in a systematic way. First, key words are identified. I recorded key words and phrases present in responses to each of the question categories. Next I grouped those key words into smaller categories of similar words. I was then able to review these smaller categories and identify the underlying themes present in responses related to each question category. Finally I was able to review all of the themes across question categories and identify larger themes connecting the question categories.

The RAPA’s scoring system asks the scorer to note the highest number on the scale that a participant endorsed. The higher the number of the scale of one to seven indicates higher levels of physical activity. The numbers are also associated with labels to indicate where an individual falls on a spectrum ranging from sedentary to active.

All recordings of the RAPA administration were transcribed verbatim. To protect against non-conscious bias on my part and additional coder was recruited to help analyze the data. Laura Yovienne, a doctoral student at UMass Boston and a practicum student at MMHC, and I, reviewed the response content in each interview to confirm accurate
completion of the RAPA checklist. In instances where the participant indicated one level of physical activity on the checklist but negated that level or provided information that made it clear there was an inaccuracy on the checklist, we indicated that this was the case and corrected the form. Using a negotiated agreement approach, we compared our own responses on all of the baseline data to discuss and resolve discrepancies before the post-intervention data was coded (Garrison, Cleveland-Innes, Koole, & Kappelman, 2006; Campbell, Quincy, Osserman, & Pederson, 2013). This procedure was employed throughout all data analysis.

Prior to quantitative analysis the RAPA data first had to be tested for normality. Testing for normality means that the data was examined to determine if it consistent with a normal distribution. A Shapiro-Wilk test was conducted to make this determination (Shapiro & Wilk, 1965). This test was selected as it is appropriate for sample sizes smaller than n=50. The results of this test indicated that the data followed a normal distribution. Thus, a one-way repeated measures ANOVA was run to determine whether differences in means were present across time points – within subject effects.

B. Do participants who engage in an skills-based intervention show improvement in their knowledge of and ability to apply mental skills?

To assess the extent to which the participants showed improvement in both their knowledge of and ability to apply the mental skills taught during the intervention – goal-setting, self-talk, visualization, and energy regulation - the data was collected at baseline, immediately following the intervention, and at six and twelve weeks following the last intervention session, using a semi-structured interview format. I was able to determine
what, if anything, participants knew about the following mental skills: self-talk, goal-setting, visualization, and arousal regulation. The semi-structured interview included questions like:

What can you tell me about “self-talk”?

Sample follow-up: Have you ever used it before? If so, tell me about it.

Sample follow-up: How have you used it or seen it used?

Not every participant was asked all of these questions for each skill. If an individual was not familiar with a skill then the follow-up questions were not posed. These interviews were transcribed and reviewed by myself and Laura, using a systematic open-ended thematic content analysis approach. They were also reviewed and assigned points for different aspects of accurate responses.

Laura was given a list of criteria on which to base points assigned (please consult Appendix E to review the grading criteria followed for point assignation). Following the review of baseline data, we consulted to ensure consistency before moving on to the post-intervention data review.

This quantitative data was then tested for normality. As with the RAPA data, a Shapiro-Wilk test was conducted and it was determined that the interview data was consistent with a normal distribution. As such, a one-way repeated measures ANOVA was run to determine whether differences in means were present across time points.

To complete the thematic content analysis, Laura was given the same instructions as were issued prior to the RAPA coding, to methodically code accurately according to the protocols established to be best practices. After the baseline data had been reviewed,
we once again compared notes to ensure consistency. Because negotiated agreement – a
discussion when discrepancies in coding emerged – was used, inter-rater reliability
coefficients are not reported, as all disagreements were ultimately resolved.

C. Do participants show an improvement in quality of life?

To assess whether or not there was an improvement in the quality of life of
participants, the WHO8: EUROHIS Quality of Life Scale (WHO8) was administered at
baseline, immediately following the last intervention session, and at six and twelve weeks
following the last intervention session. Participants’ scores were examined to determine
if a difference in means was seen between data collection points. The data were
determined to follow a normal distribution and one way repeated measures ANOVA was
conducted to determine whether a statistically significant difference was indicated.

D. Additional Measures

Pearson Product Moment Correlations were also conducted to identify potential
relationships between variables and the results of these will be discussed further in the
Results section.

The Helping Alliance Questionnaire (Luborsky et al., 1996) and the Client
Satisfaction Questionnaire (Larsen et al., 1979) were the final measures used in this study
and they were only administered once, during the final session, 12 weeks after the last
intervention session. These questionnaires are designed to elicit information from
participants about their relationship to the intervention leader and their experience of the
intervention overall. Descriptive statistics were used to conceptualize participants’
responses to this measure.
RESULTS

4.1 Data Screening

Quantitative Data

Before proceeding with data analysis, all data were carefully screened for missing data points, outliers, and normality. The following variables, “RAPA,” “Interview,” “WHO8,” “Group Attendance,” “Helping Alliance (HAQ),” and “Consumer Satisfaction,” were examined throughout the analyses. One participant was unable to attend the 6-week post intervention data collection meeting and therefore there is one data point missing from the third time point examined across all variables. A Pairwise data analysis method was employed to allow for the inclusion of this participant’s data in the instances it was available as he completed 3/4 assessment sessions.

The Shapiro-Wilk test was conducted and Q-Q plots were examined to assess the data for normality. All variables: RAPA, Interview, WHO8, Group Attendance, and Consumer Satisfaction failed to reach significance (p > .05) in the Shapiro-Wilk test, indicating that the assumptions of normality were not violated and thus normal distributions were present across all data collected. Please refer to Appendix G to view Figures 1–14, that depict the Q-Q plots. Below, Tables 1–5 also illustrate these results.
### Table 1

*Tests of Normality*

<table>
<thead>
<tr>
<th></th>
<th>Shapiro-Wilk Statistic</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAPA1</td>
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<td>.124</td>
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<td>.924</td>
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<td>.394</td>
</tr>
<tr>
<td>RAPA3</td>
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<td>.756</td>
</tr>
<tr>
<td>RAPA4</td>
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<td>.481</td>
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### Table 2

*Tests of Normality*

<table>
<thead>
<tr>
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<th>Sig.</th>
</tr>
</thead>
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<tr>
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<td>.466</td>
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<tr>
<td>Interview2</td>
<td>.859</td>
<td>10</td>
<td>.075</td>
</tr>
<tr>
<td>Interview3</td>
<td>.873</td>
<td>9</td>
<td>.131</td>
</tr>
<tr>
<td>Interview4</td>
<td>.887</td>
<td>10</td>
<td>.159</td>
</tr>
</tbody>
</table>

### Table 3

*Tests of Normality*

<table>
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<tr>
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<th>Sig.</th>
</tr>
</thead>
<tbody>
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<td>.668</td>
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<td>WHO83</td>
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<td>WHO84</td>
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<td>.371</td>
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</table>
Table 4

<table>
<thead>
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<th>Shapiro-Wilk Statistic</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups Attended</td>
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<td>9</td>
<td>.062</td>
</tr>
</tbody>
</table>

Table 5

<table>
<thead>
<tr>
<th>Tests of Normality</th>
<th>Shapiro-Wilk Statistic</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Satisfaction Questionnaire</td>
<td>.906</td>
<td>9</td>
<td>.288</td>
</tr>
</tbody>
</table>

Variable skewness was present in the Interview and WHO8 data but not in the RAPA data and there was a slight positive skewness present in the CSQ data while a negative skewness was apparent in the Group Attendance data.

Outliers were determined to be present only in the “Interview” variable at time points 3 and 4 (6 and 12 weeks post intervention) and in the “WHO8” variable at baseline. To determine whether these data would significantly impact the analyses, a one-way repeated measures ANOVA was conducted twice - once with these data points included and once without them. This analysis revealed that keeping these data points did not affect the overall results of the analysis.

The data were also examined for sphericity – the concept that the variability between differences are equal across groups. This is a necessary assumption for situations where a repeated measures ANOVA is indicated to examine differences in
means over time. Only the Interview data violated this assumption. To account for this violation a Greenhouse-Geisser Correction was employed (Box, 1954).

4.2 Data Analyses

Quantitative Data

The Statistical Package for the Social Sciences, Version 22.0 supported all quantitative analyses (IBM Corp., 2013). The analyses conducted were both descriptive and inferential in nature. For the latter a two-tailed alpha level of 0.05 was selected to discern statistical significance, as this level of significance is most apt to protect against false positives, also known as the Type One Error.

Descriptive statistics were used to discuss trends present in the “Group Attendance” and “Consumer Satisfaction” variables. Pearson Product Moment Correlations were employed to examine relationships between variables, and one-way repeated measures ANOVA were conducted to detect changes in the variables “RAPA,” “Interview,” and “WHO8,” (physical activity, skills knowledge, and quality of life, respectively).

Descriptive Statistics

Group Attendance, Helper Alliance, and Consumer Satisfaction data were examined using descriptive statistics. On average, participants attended 4.4 (out of 6) group sessions. Over half of the participants (seven) attended at least four groups and four participants attended all six sessions. Descriptive statistics are shown in the table below. Participants reported scores on the Helper Alliance Questionnaire ranging from 51 to 104, out of a possible 114. The average score was 86. Participants omitted an
average of three questions (18 points possible) per questionnaire, as they did not see them as applicable to their experience with the group leader. Scores on the Client Satisfaction Questionnaire, out of a possible 32, ranged from 25–31. The average score was 27.2, the mode was 27.6 and the median was 27.5.

Table 6

<table>
<thead>
<tr>
<th>Description</th>
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<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
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<td>31.00</td>
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<td></td>
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<td>Helping Alliance Questionnaire</td>
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<td>104.00</td>
<td>86.00</td>
<td>16.06</td>
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<tr>
<td>(max. 32)</td>
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<td></td>
<td></td>
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<tr>
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<td>6.00</td>
<td>4.40</td>
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<tr>
<td>(max. 6)</td>
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<td></td>
</tr>
</tbody>
</table>

Hypotheses

Hypothesis 1: An increase in physical activity reported by participants will occur.

To examine this hypothesis, a one-way repeated measures ANOVA was conducted to examine reported physical activity of participants, as indicated by the RAPA variable, across time points (pre-intervention, post, 6 weeks post, 12 weeks post).

The results of this test show that the group intervention yielded a statistically significant change in means across the RAPA variable, over time, $F(3,24) = 4.635$, $p = .011$. A Medium Effect Size was also noted, ($\varepsilon = .367$), as shown in Table 7.
Table 7

Tests of Within-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAPA</td>
<td>Sphericity Assumed</td>
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<td>10.546</td>
<td>4.635</td>
<td>.011</td>
<td>.367</td>
</tr>
</tbody>
</table>

Between time points 1 and 2 (pre and post) an increase in RAPA scores was indicated, (M = 4.333, 6.667, SD = .782, 95% CI [.531, 4.136], p = .017). An increase was also seen between time points 1 and 3 (M = 4.333, 6.556, SD = .741, 95% CI [.513, 3.931], p = .017). No significant differences were noted between any other time points. Thus Hypothesis I is supported by these results. These results are presented in Table 8.

Individual participants' scores across time points are illustrated in Figure 15, in Appendix G.

Table 8

Pairwise Comparisons

<table>
<thead>
<tr>
<th>(I) RAPA</th>
<th>(J) RAPA</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>-2.333*</td>
<td>.782</td>
<td>.017</td>
<td>-4.136</td>
<td>-.531</td>
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<td>4</td>
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<td>.064</td>
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<td>.135</td>
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<tr>
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<td>2</td>
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<td>.782</td>
<td>.017</td>
<td>.531</td>
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<td>2</td>
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<td>.017</td>
<td>.513</td>
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<td>3</td>
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</tr>
<tr>
<td>4</td>
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<td>.466</td>
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<td>1.782</td>
</tr>
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<td>.064</td>
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<td>3.691</td>
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<td>4</td>
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<td>.508</td>
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<td>-.444</td>
<td>.580</td>
<td>.466</td>
<td>-1.782</td>
<td>.893</td>
</tr>
</tbody>
</table>

Based on estimated marginal means

* The mean difference is significant at the .05 level
Hypothesis II: Participants will show an improvement in mental skills knowledge.

To examine this hypothesis, a one-way repeated measures ANOVA was conducted to examine the mental skills knowledge of participants, as measured by the Interview variable, across time points (pre-intervention, post, 6 weeks post, 12 weeks post). Two outliers were identified within the Interview variable at the 6 weeks post-intervention time point. Both outliers indicated higher scores on the Interview. Two outliers were also identified within the Interview variable at the 12 weeks post-intervention time point. One of these outliers was higher than the majority of Interview scores and one was significantly lower. The former was created by one of the same participants who created the outlier during the 6 weeks post-intervention time point.

After correcting for the sphericity violation, the results of the one-way repeated measures ANOVA indicated that the group intervention yielded a statistically significant difference between means, as measured by the variable Interview, over time, \( F(1.949, 15.596) = 4.117, p = .038 \). A Medium Effect Size was also indicated, \((\eta^2 = .340)\), as shown in Table 9.

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Greenhouse-Geisser</td>
<td>58.778</td>
<td>1.949</td>
<td>30.150</td>
<td>4.117</td>
<td>.038</td>
</tr>
</tbody>
</table>

A statistically significant increase in mental skills knowledge as measured by the Skills Interview was seen between time points 1 and 2 (pre and post), \((M = 5.8889,\)
9.4444, SD = .988, 95% CI [1.278, 5.833], p = .007). Statistically significant improvement was also noted between time points 1 and 3 (pre and 6 weeks post), (M = 5.8889, SD = .539, 95% CI [.647, 3.131], p = .008). No significant differences were noted between any other time points. Thus Hypothesis II is supported by these results. These results are also presented in Table 10. Individual participants’ scores across time points are illustrated in Figure 16, in Appendix G.

Table 10
Pairwise Comparisons

<table>
<thead>
<tr>
<th>(I) Interview</th>
<th>(J) Interview</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval for Difference</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>-3.556*</td>
<td>.988</td>
<td>.007</td>
<td>-5.833 - 1.278</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
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<td>.539</td>
<td>.008</td>
<td>-3.131 - .647</td>
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<tr>
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<td>.063</td>
<td>-4.824 .157</td>
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<td></td>
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<tr>
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<td>3</td>
<td>3.556*</td>
<td>.988</td>
<td>.007</td>
<td>1.278 5.833</td>
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<tr>
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<td>.647 3.131</td>
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<td>-.157 4.824</td>
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<td>2</td>
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<tr>
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<td></td>
<td>.444</td>
<td>1.002</td>
<td>.669</td>
<td>-1.865 2.754</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on estimated marginal means

* The mean difference is significant at the .05 level
Hypothesis III: An improvement in “quality of life” as measured by the WHO8 will occur.

To examine this hypothesis, a one-way repeated measures ANOVA was conducted to examine reported quality of life of participants, as measured by the WHO8 variable, across time points (pre-intervention, post, 6 weeks post, 12 weeks post).

The results of this test show that there were no statistically significant differences between means in the quality of life variable, F(3,24) = .233, p = .872. The results of this test indicate that the null hypothesis, stating that there would be no improvement in quality of life as measured by the WHO8, should be accepted. Therefore this hypothesis is not supported. Tables 11 and 12 present these results. Individual participants’ scores across time points are illustrated in Figure 17, in Appendix G.

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
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</thead>
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<tr>
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<td>0.024</td>
<td>0.233</td>
<td>0.872</td>
<td>0.028</td>
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</table>
Table 12

Pairwise Comparisons

<table>
<thead>
<tr>
<th>(I) WH08</th>
<th>(J) WH08</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval for Difference</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>.521</td>
<td>-.547</td>
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<td>.744</td>
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<td>.195</td>
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<td>.107</td>
<td>.533</td>
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<td>.127</td>
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<td>2</td>
<td>.030</td>
<td>.120</td>
<td>.809</td>
<td>-.246</td>
</tr>
</tbody>
</table>

Based on estimated marginal means

Additional Analyses

Pearson Product Moment correlations were conducted to examine potential relationships between variables. The results of this test indicate a statistically significant positive correlation between the variable Interview 2, the variable associated with mental skills knowledge (post-intervention), and the variable RAPA 2, \( r(9) = .693, p = .026 \). The Pearson Product Moment correlation also indicates a positive relationship between Interview 2 and the variable RAPA 3, \( r(9) = .753, p = .019 \). This result indicates that as participants’ scores on Interview 2 increased, so too did their scores on RAPA 2 and RAPA 3.

Significantly negative correlations were noted between WHO81 and RAPA2 (\( r(9) \))
= -.646, p = .044); WHO82 and RAPA4 (r(9) = -.671, p = .034); and WHO83 and RAPA4 (r(9) = -.735, p = .024). Table 13 presents the statistical details of the significant correlations. A more comprehensive table (Table 16) showing all of the correlation numbers can be found in Appendix G.

Table 13

<table>
<thead>
<tr>
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<th>RAPA2</th>
<th>RAPA3</th>
<th>Interview2</th>
</tr>
</thead>
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<td>.693*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.019</td>
<td>.026</td>
</tr>
<tr>
<td>N</td>
<td>10</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Pearson Correlation</td>
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<td>.753*</td>
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<tr>
<td>RAPA3</td>
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<tr>
<td>Sig. (2-tailed)</td>
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<td>.753*</td>
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<tr>
<td>Sig. (2-tailed)</td>
<td>.026</td>
<td>.019</td>
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<td>N</td>
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* Correlation is significant at the .05 level (2-tailed).

4.3 Data Analysis

Qualitative Data

The qualitative data were analyzed using Qualitative Content Analysis (QCA) (Mayring, 2000). Grounded Theory (Glaser & Strauss, 1967) was considered when reviewing the analysis options but ultimately rejected because the questions being posed were derived from the curriculum used in the intervention and, as such, were too directive. Grounded Theory is only indicated when theory will emerge from the data. In this case, the interview questions were derived from theory and therefore QCA was the more appropriate choice (Cho & Lee, 2014).
An open-ended systematic thematic content analysis approach was applied, using the following, data-driven categories: goal-setting, visualization, self-talk, and energy management. Using this method, the qualitative data were reviewed and themes were identified.

Laura was also recruited to protect against any bias and to ensure that the data were represented accurately. Prior to the coding process Laura and I reviewed the coding method to be employed. After the first round of data was reviewed, Laura and I then reviewed the results to ensure that there was no procedural confusion or difficulty. None was indicated and coding moved forward as planned. The following section describes the themes that emerged from the qualitative data.

**Overview of Results**

A progression of participant responses was noted within each category. While baseline responses were vague or indicated uncertainty, this changed over time. In subsequent interviews participants’ responses were presented with more confidence both in terms of strict definitions and the depth and breadth of examples offered. This confidence was demonstrated by quick responses, a decrease in processing time prior to answering, and responses anchored to the intervention itself. Respondents often referred to the group or referenced me saying something during the intervention that they remembered. If they struggled to recall an answer they expressed that they knew there was a “correct” answer and that they were just searching for it. Additionally participants began discussing examples related to goals in other areas of their lives (aside from fitness) in later interviews. Rather than offering examples strictly related to fitness or
exercise goals, several participants discussed the benefits of using mental skills in relation to symptom management and academics as well. These results indicate that not only did participants retain and understand how to apply their knowledge in the domain discussed in the intervention, but they also used these skills in other areas of their lives as well. The following sections will offer specific evidence to support these overarching themes within each category.

**Goal-Setting – What does goal-setting mean to you?**

At baseline most participants described goal-setting broadly and touched on the concept of planning. Responses included: “just like making a plan” “setting something to accomplish” and “a plan that you’re trying to reach”. Largely these responses ignored specific aspects of goal-setting. Rather than describing particular criteria associated with well-formed goals, most participants spoke generally about something they wanted to achieve but did not speak to a plan of action for achievement of that goal.

Immediately following the intervention participants were more intentional in their responses. They referred to specific criteria and a directed plan of action. This round of interviews included responses that acknowledged the importance of “attainable and realistic” goals as well as the importance of breaking large goals into smaller steps. Responses supporting these themes included: “set a goal that’s realistic and attainable” “setting a goal and doing small things to get to it” and “deliberately making a plan and being specific to get the goal.”

Six weeks post-intervention responses emphasized the importance of specific goal identification and active movement towards the identified goal. Responses supporting
this theme included: “setting something in the future and working towards it” and “taking an active approach to life”. Other participants focused on the specifics addressed in the previous round, acknowledging the importance of realistic and attainable goals – “a realistic achievement that you want.”

Twelve weeks post intervention responses indicated that participants were focused on identifying strategies to increase success. Responses supporting this theme include: “Set measurable goals that you can accomplish like it becomes more easy to complete the goal once you have one set like when you're going to do it and where you're going to do it” “trying to set out a goal, you want to make it as detailed as possible” and “setting a goal um achieving it like as in like maybe you plan it, write it out even…”

Self-Talk – *What can you tell me about self-talk?*

At baseline responses to the self-talk question yielded responses that implied uncertainty, with many participants framing their answers as questions. Most repeated the phrase “self-talk” before offering the following responses: “Talking to yourself?” and “Maybe like talking in your mind?”

Immediately following the intervention, responses were more confident and none were presented in question form. There answers came faster and their tone of voice tended to be stronger. This round of interviews featured responses that also emphasized the different valences associated with self-talk, and indicated that individuals should aim for self-talk that is positive in nature. Responses supporting these themes include: “Trying to say good things about yourself rather than negative” “Little voice in your head that can be positive or negative” and “Helps you change your mind about something”.
Six weeks post-intervention responses featured many examples and less emphasis was placed on regurgitating exactly what was learned during the intervention. Participants demonstrated increased ownership of the material, providing accurate responses in their own words rather than in the exact language of the group. These responses also indicate an increased understanding of skills and examples related to fitness goals. The following are responses offering evidence in this vein: “Other days I’m like “Aww, man! but I’m usually able to talk to myself enough that I end up getting to the gym.” “You can do this – we set a goal, let’s do it” and, “I do little self-check-ins to make sure I plan well for the morning.”

Twelve weeks post-intervention, responses continued to focus on examples and practical applications across domains, not limited to fitness or exercise goals. Responses in support of these themes include: “I do a lot of self-talk for various reasons. When I'm upset I try to self-talk myself into letting it go but there's also a lot of self-talk that goes into working out every day,” and “It can help with anything.” One participant’s clinician reached out to let me know that he had shared all of the skills with her and asked her to help him apply them to his therapy goals.

Visualization – What do you know about visualization?

At baseline responses to the visualization question yielded responses that implied uncertainty, with many participants framing their answers as questions. Some responses were framed as questions or acknowledged to be guesses. In some cases participants processed aloud, noticing that “visual is like vision, so maybe…”

Immediately following the intervention responses were more confident and none
were presented in question form. This round of interviews featured responses that also emphasized the combining of skills in addition to exhibiting increased confidence in the definitions of self-talk offered. Once again this increase in confidence was evident in the response time needed and the tone of voice in which answers were presented. In some cases, body language changed as well with participants sitting up straighter and preparing to answer as the question was being asked. Responses supporting these themes include: “Trying to picture the activity using your senses”, “See yourself doing it before you do the exercise”, and “Seeing the results before you have them – I use self-talk with my visualization”.

Six weeks post-intervention responses featured many examples and less emphasis was placed on strictly defining the concept. These responses also indicate an increased understanding of skills from a functional perspective. The following are responses offering evidence in this vein: “Picturing the activity”, “Trying to picture the activity using your senses”, and “When you picture yourself completing a task it makes it easier to do”.

Twelve weeks post-intervention, responses continued to reflect a clarity of understanding and an increased ability to understand how skills support each other. Responses in support of these themes include: “When you see where you want to be, it’s easier to get there” “I use it when I don’t feel like going to the gym” “Imagining something and I use it with goal-setting”.


Energy Management – What does energy regulation or energy management, mean to you?

At baseline responses to the energy management question yielded responses that implied uncertainty, with many participants framing their answers as questions. Examples included, “I don’t really understand that” “Like what you eat for energy?” and “Eat a lot of carbs?”

Immediately following the intervention responses were more confident and none were presented in question form. This round of interviews featured responses that also emphasized the purpose of energy management techniques in addition to exhibiting increased confidence in the definitions of self-talk offered. Responses supporting these themes include: “Something that helps you get amped”, “Sometimes you need to boost your energy before you can exercise”, and “Making sure you have energy for your blocks of exercise”.

Six weeks post-intervention responses featured many examples and, once again, less emphasis was placed on strictly defining the concept. These responses also indicate an increased understanding of skills from a functional perspective. The following are responses offering evidence in this vein: “Sometimes you need boosters, music is a good booster”, “I listen to music because I have low energy and it gets me excited”, “Doing stuff to get you up and amped”.

Twelve weeks post-intervention, responses continued to reflect a clarity of understanding and concrete examples with functional explanations. These responses were also given in the participants’ own words – relying less on restating the exact phrase
taught during the intervention as the answer. Responses in support of these themes include: “When your energy is low you have to do things to get it up”, “I’m more laid back than most people, I need to boost my energy to exercise”, “A way to get yourself amped to do exercise”.

Advice – If you had a friend who wanted to go for a walk every morning and he was having trouble following through, what advice would you give him?

At baseline, responses to the advice for a friend question yielded responses that emphasized social connections as motivation as well as touching on the notion of rewarding oneself post-exercise. Specific mental skills were not touched upon in these responses. Some responses from this time point included: “Tell him to go with a friend”, “Look forward to something after”, and “Maybe find somebody to go with?”

Immediately following the intervention responses were more focused on mental skills and the benefits of exercise. Responses supporting these themes include: “Remind him about the benefits”, “Tell him to use self-talk, turn squishy goals into better ones”, and “I would give him the advice to use self-talk”.

Six weeks post-intervention responses again featured specific mental skills but more of these skills were discussed than had been previously. The following are responses offering evidence in this vein: “Tell him to use positive self-talk and visualization to push through”, “Stretch and listen to a good song to get ready”, and “Pick a specific day and time and it’ll be much easier”.

Twelve weeks post-intervention, responses continued to emphasize mental skills but participants took more care to elaborate on what these skills mean and how to use
them than they had in previous interviews. Responses in support of these themes include:

“Set a specific time and place”, “Picture yourself going to the gym, get up and go” and,

“Write the goal down and make a plan”. 
DISCUSSION

This study tested the feasibility of a six-week, skills-based curriculum aiming to promote physical activity among individuals diagnosed with schizophrenia and schizophrenia related disorders.

According to the Stage Model of Behavioral Therapies Research, which dictated the design of this protocol, attendance rates, consumer satisfaction, and significant improvement in at least one outcome area were the most important factors to consider in determining feasibility (Rounsaville, Carroll, & Onken, 2001).

Significant improvements were noted in two key outcome areas: mental skills knowledge and physical activity participation. Attendance rates as well as consumer satisfaction were both adequate. Adequacy is determined by the practicality of implementation based on these numbers. Group members averaged attendance at 4.4 group sessions, or 73% of the sessions offered.

This section will discuss the findings, implications, and limitations of this study as well as potential directions for future work.

5.1 Findings

Hypothesis 1: Participants will show an increase in physical activity as measured by the RAPA, following the intervention.

The literature indicates that individuals diagnosed with serious mental illnesses are physically able to engage in exercise but are frequently unable to motivate themselves (Dodd et al., 2011; Warren et al., 2011; Methapatara & Srisurapanont, 2011). The significant increase in RAPA scores between baseline and post/6 weeks post-intervention
indicates that these individuals are able to overcome barriers, motivational or otherwise, to exercise.

Though no study prior to this one had ever specifically examined the relationship between mental skills knowledge and exercise in people diagnosed with serious mental illnesses, these results are consistent with the literature that explores health behavior promotion among individuals in the general population (Saelens et al., 2000; Andersson & Moss, 2010).

The consistency in these results indicates that the same skills that have been taught to the general population for the purpose of health behavior promotion, can successfully be taught to individuals diagnosed with schizophrenia and related disorders. This implies that researchers, perhaps, do not have to reinvent the wheel to serve the schizophrenia and related disorder population and that, in fact, many of the techniques used in the general population may be effective in promoting health behaviors among individuals diagnosed with schizophrenia and related disorders.

Hypothesis 2: Participants will show an increase in mental skills knowledge as measured by a semi-structured interview, following the intervention.

Consistent with the literature, significant improvement in mental skills knowledge, as measured by Interview scores, between baseline and post-intervention and 6 weeks post-intervention was noted. The literature suggests that these mental skills have been successfully taught to individuals diagnosed with psychotic disorders for other purposes and that these individuals have been able to apply these skills. Research also shows that teaching of these mental skills in other contexts, both within this population
and in the general population, has been successful (Casallas, 2004; Saelens et al., 2000). Consistent with the literature, significant improvement in mental skills knowledge, as measured by Interview scores, between baseline and post-intervention and 6 weeks post-intervention was noted.

This increase in scores indicates that participants, overall, improved in the area of mental skills retention and application. Given that there was no control group, and that this was a feasibility study, I cannot make the statement that this increase in knowledge was the direct result of the group. I can, however, suggest that the improvement in this domain demonstrates that this skill set is acceptable and accessible to this population and that they are able to recall and apply this information independently. Thus, this skill set is one worthy of further exploration, perhaps with an emphasis on determining the most effective presentation of this information.

Hypothesis 3: Participants will show an increase in quality of life as measured by the WHO8, following the intervention.

This hypothesis was not supported by the results. Despite the fact that no significant change was noted here, several participants spontaneously shared general feelings about themselves such as “I’ve been feeling good,” “Going to the gym makes me like myself more,” and “My mood seems a little better and I snap less with more exercise.” While the WHO8 did not indicate any significant changes in quality of life, some participants did endorse more positive feelings related to their self-concept over the course of the intervention and attributed these feelings to exercise.

It may be the case that the WHO8, derived from the WHOQOL-100 was too brief
to fully capture changes in quality of life related to the social realm and that the aspects of life that were positively impacted, were not included in this measure. In a study examining the WHOQOL-BREF, it was determined that the shorter versions of the WHOQOL-100 may be less sensitive to change in these areas (O’Carroll, Smith, Couston, Cossar, & Hayes, 2000). Participants did not specifically mention relationships or social interactions in their expressions of satisfaction with themselves relative to the intervention and increased exercise but a measure that was designed to pull for that data may have yielded more informative results.

It also may be the case that participants had not yet reaped the more obvious benefits of their increased participation in exercise, such as weight loss or increased muscle tone, because they simply had not been exercising consistently enough for a long enough duration to see those changes.

Summary of Findings

The Stage Model of Behavior Therapies indicates that a successful Stage 1b Pilot Trial must demonstrate adequate attendance rates and consumer satisfaction scores as well as significant improvement in at least one outcome area.

This study met those criteria. Group attendance was 73%, which the literature indicates to be above what is considered “acceptable” in this area of the field. Consumer satisfaction scores came in at 84%, a number also considered adequate by this body of literature’s standards. Significant improvements were also noted in two outcome areas, mental skills knowledge and physical activity participation.

Taken together, these results indicate that further research is warranted to explore
the effectiveness of this curriculum among individuals diagnosed with schizophrenia and related disorders. While the outcome area improvements suggest that this curriculum may have been effective, without a control group it is impossible to make that determination. The results do indicate, however, that the skill set presented is acceptable to this population and the attendance rates imply that the modalities of teaching used in the group were acceptable to the participants.

The qualitative data also shed light on several additional concepts not captured by the hypotheses. For instance, participant responses did not just improve in terms of accuracy across assessment sessions, but in depth and application. Baseline responses indicated guesses and uncertainty before the next assessment session showed that participants were attempting to directly recall information. The last two assessment sessions produced results more indicative of a comfort with the material, and the sense that participants had really taken it and made it their own as they used their own language and examples rather than those presented in group sessions.

The growth these responses exhibited over time indicates not only an acceptability of the skill set presented but an ability to access those skills, practically, very soon after encountering them for the first time. This is particularly notable because participants naturally began applying these skills to areas outside of physical activity. They were quick to provide examples of themselves using these skills to motivate themselves in academic work and employment, or even in managing their symptoms - and this broader application was not directly discussed during the curriculum.

The qualitative data also emphasized a theme of self-efficacy. While the quality
of life measure failed to capture any significant changes, participants made spontaneous statements across group sessions commenting on how they were feeling after successfully completing a weekly physical activity goal. Comments supporting this themes included, “My mood seems a little better and I snap less with more exercise” and “Going to the gym makes me like myself more.” These comments indicate a sense of control or empowerment that was potentially reinforcing and this result should be explored further in future research.

5.2 Limitations

While the results indicated by this study are promising, it is important to recognize several limitations. The sample size is small, the age range is limited, as the majority of participants were under the age of 30, self-report measures are inherently susceptible to bias, and the group leader filled many roles throughout the implementation and analysis processes. Also, due to this being a feasibility study, there was no control group and therefore any changes in variables cannot be attributed to the curriculum.

Sample Size

Despite the fact that pilot studies are not designed for the purpose of generalizing to a broader population, a larger sample may have benefited the results by providing more information regarding variable relationships and trends (Leon, Davis, & Kraemer, 2012).

Sample Diversity

Most individuals who participated in the study were in their early twenties. One participant was in his late thirties and another in her early forties. The fact that many of
the participants were relatively young, in age and diagnosis, may have affected the data. Younger individuals diagnosed with psychotic disorders have been medicated for a shorter period of time and therefore have not experienced medication side effects for as long as older individuals diagnosed similarly. They have also likely been contending with the negative symptoms of the disorder that significantly impact motivation, for shorter periods of time than older individuals carrying the same diagnoses. This younger sample may also be in better physical condition and not face as many physical barriers to physical activity participation.

Additionally, in this sample the younger participants have benefited from treatment early in their disorder’s course, which may have protected against more severe symptomatology and primed these participants for success in a skills-based group setting. A wider age range represented in the sample would have been able to provide more information regarding relationships between age and key variables.

**Self-Report Measures**

Self-report methodology is a limitation that plagues research in this area of the field, as there are few other ways to gather information about personal habits. In an effort to improve the reliability of these self-reports, certain procedures were followed. The RAPA (Topolski et al., 2006) is a checklist that participants completed before then being interviewed based on their responses. This administration procedure was employed to gather substantiating qualitative data to accompany the yes or no responses endorsed on the questionnaire and to ensure that the participants’ verbal reports matched the responses given on the measure.
Information regarding knowledge and understanding of mental skills was collected via interview to better assess participants’ understanding of the skills and how they can be employed. The interview format allowed for the posing of hypothetical scenarios and questions and I was able to observe participants moving through their repertoire of knowledge and logic to apply mental skills to specific situations in the moment. Interviews are also more likely than written tests of knowledge to capture misunderstandings. A written test may just yield an incorrect response but an interview yields richer and more detailed data so any common misconceptions about the material are more likely to surface.

I observed, for instance, that when individuals gave incorrect responses regarding energy management, many of them emphasized the role of nutrition. While nutrition is obviously important to our energy resources, energy management as defined in the intervention refers to mentally preparing for exercise. Those participants who responded correctly, sometimes also focused on nutrition in addition to the correct answer as well. Those who were able to remember the correct details of the technique without offering additional incorrect information, focused on the phrase “energy boosters”. This phrase was evidently helpful and perhaps more self-explanatory when revisited than “energy management.” In the future it might be helpful to teach this skill under the name “energy boosting” as it seemed to be more easily understood and recalled by participants.

Lack of Control Condition

This study was designed in accordance with The Stage Model for Behavior Therapies, as a Stage 1b Pilot Trial. As such, its purpose was to determine if there were
significant improvements in any outcome area and whether the curriculum was acceptable to the target audience as evidenced by consumer satisfaction ratings and attendance rates. No control group was included.

The lack of a control group is important to acknowledge because it means that while significant improvement was seen in two outcome areas, and the presence of this improvement indicates that future research is warranted, that improvement cannot be attributed to the intervention. Without a control group a myriad of other factors may have been responsible for the increases in physical activity and mental skills knowledge. Participants may have enjoyed better weather that coincided with the group and that may have accounted for the increase in physical activity. Perhaps there was an ad campaign encouraging people to use self-talk. Without a control group it is impossible to know whether the curriculum was responsible for any of the improvements seen and that is why the improvements can only indicate that future research is warranted, not that the intervention was effective.

*Group Leader as Rater*

In this study I served both as the group leader and as one of two raters for the data. While an additional rater also worked with the data to protect against rater bias, it is important to acknowledge that this dual role may have impacted the data analysis and perhaps even the data collection. I was also the individual conducting the assessment sessions with the participants and this may have impacted the effort they put forth in answering questions. My presence might have even supported their ability to recall information simply due to environmental cues associated with learning. In the future it
would likely be helpful to have the roles of group leader, data collector, and rater, filled by different individuals to protect against any bias or influence.

5.3 Clinical Considerations

The following section is included to support providers who may consider implementing this curriculum in other locations. There were unique benefits associated with piloting this study in Boston, MA and these must be acknowledged to best prepare providers looking to implement this or a similar curriculum elsewhere.

Sample Access to Intervention Site

It is important to note that the individuals participating in this study were recruited at the same site where the study was conducted. This is crucial to emphasize as these individuals were already familiar with and comfortable in the setting in which they attended the intervention groups. They were also already comfortable (and used to) navigating to and from this location. Boston is also a city that prides itself on the availability of public transportation. This ease of access to, and familiarity with, the intervention site is unique and may have skewed results. If the location was not as accessible/comfortable, group attendance, and perhaps consumer satisfaction would have been impacted.

Sample Level/Quality of Care

The fact that this study was conducted in Massachusetts, which is a reasonably well-resourced state in terms of mental health services, is another important point to consider. According to a 2009 NAMI report titled “Grading the States” the national average “grade” regarding mental health resources is a “D” (NAMI, 2009).
Massachusetts earned a B, along with only 5 other states (NAMI, 2009). The remaining 45 states and Washington D.C. all received grades lower than a B (NAMI, 2009). As such, the level and quality of care available to the participants in this study may also have resulted in data supporting the hypothesis.

Recruitment took place at the Massachusetts Mental Health Center, which serves individuals diagnosed with major mental illnesses in an outpatient setting. 7/10 (70%) of the clients who participated in the study are currently attending PREP (Prevention and Recovery in Early Psychosis), an affiliate program of MMHC that offers individual therapy, group therapy, case management, assessment, and psychiatry, twice weekly. That level and quality of care is somewhat unique and therefore is an important factor to consider when examining the results of this study, their implications, and directions for future research.

*Incentive Money*

Incentive money was also offered at each of the four assessment sessions. Participants received $10 at the completion of each of these sessions with the opportunity to earn a $20 bonus for perfect attendance at all group and intervention sessions. The money was not referenced during the group sessions often. A few clarifying statements were made during the very first group session, making sure that the money was only associated with assessment sessions and one client referenced the money as incentivizing during the last group session. She made the statement that she had not felt like making the trek to MMHC following a difficult morning but that she used self-talk to remind herself that she would ruin her perfect attendance and lose the $20 bonus if she did not
persevere. The absence of discussion was notable as $10 is a significant amount of money for most of the group members. While all were pleased, as demonstrated by spoken gratitude and smiles, to receive the money, participants did not note this as a primary source of motivation to attend groups. This may have been because it was tied only to the assessment sessions and therefore was not immediate enough an incentive to motivate attendance at the group sessions.

### 5.3 Future Work

While this study yielded significant results future work is essential to determining whether these results are generalizable to a larger, more diverse, population and discerning the most efficacious implementation of the intervention.

This study was designed to satisfy the requirements of a Stage 1b: Pilot Trial, according to the Stage Model of Behavioral Therapies Research (Rounsaville, Carroll, & Onken, 2001). This model dictates that following curriculum development, researchers must first test the feasibility of their intervention in the context of a pilot trial. When this trial is successful in terms of acceptance, recruitment, practicality, and significant improvement is noted in a key outcome area, the model suggests that a Stage II study should be conducted.

A Stage II study requires a randomized clinical trial and this is the next indicated step in exploring the effects of this intervention. A larger and more diverse sample is recommended to ensure that the effects noted hold with this more representative sample. It would be especially interesting and informative to recruit individuals accessing different types of treatment, despite a similar level of functioning to determine if any
differences in intervention effects are noted when that is the case. Individuals attending comprehensive outpatient treatment, for instance, might be primed to benefit from an intervention of this type due to the fact that they perhaps attend many skills-based groups. Whether individuals less familiar with this format benefit similarly should be explored.

Improvements in mental skills knowledge and physical activity were indicated between baseline, and immediately following the intervention as well as between baseline and six weeks post-intervention. At 12 weeks post-intervention, significant results were no longer found. This is important for future studies and interventions. Based on this information, future studies may wish to include and evaluate the effectiveness of “booster” sessions after six weeks following the intervention to refresh participants’ knowledge of mental skills and facilitate discussions to help them acknowledge the importance of their goals. These are commonly seen in skills-based groups that have been developed beyond the pilot study stage (Bearss, Johnson, Handen, Smith, & Scahill, 2013; Farrell, Meyer, & White, 2010).

A significant relationship was also noted between post-intervention mental skills knowledge and physical activity post-intervention and six weeks post-intervention. This indicates that the participants who truly gained an understanding of mental skills over the course of the intervention were likely able to apply these skills and continue to do so even after the intervention ended. This correlation further necessitates the examination of the effects of a booster review session.

Although there was no significant improvement in quality of life as measured by the WHO8, individuals spontaneously shared that they felt better about themselves.
Future studies may consider the addition of a self-efficacy measure and perhaps even including the full WHO-QoL measure to better capture the variety of factors that contribute to quality of life. A self-efficacy measure may be more sensitive to the intervention given that self-efficacy may be more directly related to the intervention material than a general life quality assessment.

5.4 Implications

According to the literature, individuals diagnosed with schizophrenia and related disorders, die up to 25 years earlier than the general population (Viron et al., 2012). They are at an increased risk for early mortality due to the negative symptoms associated with their illnesses and the harmful side effects caused by many antipsychotic medications (Viron et al., 2012). As such, it is critical that these individuals develop and maintain healthy exercise habits. The results of this study indicate that individuals diagnosed with psychotic disorders can learn, retain, and apply knowledge of mental skills and use these to motivate themselves to engage in physical activity.

The results of this study support the rationale for teaching and incorporating these mental skills should be taught and incorporated throughout clients’ mental and physical health treatment. Individuals diagnosed with SMIs have successfully applied these skills to symptom management so it stands to reason that these skills should be taught consistently in mental and physical health settings whether the goals are physical, mental, academic, or occupational. These skills were taught over the course of the present intervention and discussed in the context of fitness goals. However, participants were eager to apply them to different areas of their lives as well, as demonstrated by their
comments.

This may be the case because the skills are relatively simple and easy to grasp or because they are based in accessible, everyday language rather than “therapy” language. Whatever the reason, participants were able to understand the concepts relatively easily and were quick to apply them to other areas of their lives. This natural tendency implies that increased incorporation of these skills in treatment may yield increased positive outcomes (i.e., success in academics, employment, relationships, etc.) for this population. This is also a curriculum that could be easily implemented in a variety of settings and at different levels of care. Because it is only 6 weeks long and sessions are designed to run for only one hour, it could be included in inpatient settings, day programs, partial hospitalization programs, schools, and/or intensive outpatient programs.

Given that this study was small and designed to determine whether or not an intervention of this kind is feasible, it is important to consider not only retention and satisfaction rates but also the factors that contributed to these. Attendance across sessions was good, 66% on average across sessions with the majority of participants attending over half of the sessions and no fewer than 7 participants present at each session. Participants’ responses on the CSQ (ranging from 25–31/32) indicate a high level of satisfaction with the group.

The activities designed for this group also promoted positive social interaction among participants. As they became more comfortable with each other and with working together, I observed more cross-talking and group members interacted with each other more frequently and easily as the sessions progressed. Based on these observations and
the success of this study, interventions aiming to teach skills and promote physical activity should aim to foster a similar feeling of community within the group as it likely increased attendance rates and satisfaction among group members.

Making food available decreased the likelihood that hunger would prevent participants from learning during group sessions but it also brought people together. Often conversations started around the snack options and developed into more in depth discussions about food in general, childhood snacks, and preferences in other areas. It would be speculative to state that participants attended the group for access to these snacks but they did likely contribute to the comfortable atmosphere of the group and helped eliminate hunger as a barrier to learning. An awareness of group timing, physical needs of participants, and simple opportunities for social connection should all be promoted to optimize attendance and retention rates.

Incentive money was also offered at each of the four assessment sessions. Participants received $10 at the completion of each of these sessions with the opportunity to earn a $20 bonus for perfect attendance at all group and intervention sessions. The money was not referenced during the group sessions often. A few clarifying statements were made during the very first group session, making sure that the money was only associated with assessment sessions and one client referenced the money as incentivizing during the last group session. She made the statement that she had not felt like making the trek to MMHC following a difficult morning but that she used self-talk to remind herself that she would ruin her perfect attendance and lose the $20 bonus if she did not persevere. The absence of discussion was notable as $10 is a significant amount of
money for most of the group members. While all were pleased, as demonstrated by spoken gratitude and smiles, to receive the money, I did not get the impression that the money motivated most of the participants. This may have been because it was tied only to the assessment sessions and therefore was not immediate enough an incentive to motivate attendance at the group sessions.

Emphasis on participant enjoyment and engagement is also critical. In this intervention, each session opened with a check-in followed by a short PowerPoint presentation and an activity that allowed participants to apply their newly acquired knowledge. The presentations always incorporated cartoon characters and were written in casual font and accessible language. The activities ranged from teams building towers using office supplies to an in-classroom version of basketball, and an exercise emphasizing the use of funny voices, silly walks, and laughter.

Groups then ended with another brief check-in focused on identifying goals and strategies for the next week. This format seemed to work well for the group. Participants were able to stay focused throughout sessions, possibly because the sessions did not rely on one modality of teaching for more than 15-minute increments. The frequent transitions may have made it easier for participants to stay present in the session and therefore they had fewer opportunities to feel bored or to disengage. Based on the attendance rates in this study, such a format may be particularly successful in working with this population.

It is also important to note that this intervention is extremely accessible not only for participants but for potential group leaders. Each session is assigned certain
objectives, uses a PowerPoint presentation and videos (linked within the presentation) to guide the brief lecture aspect of the group, and the activities are well developed and described. This intervention was designed with dissemination to other providers in mind, and the awareness that many group leaders would appreciate an opportunity to lead a group that is already fully designed and prepared. At present, other than securing space and materials, clinicians would need almost no preparation time to conduct the group successfully.

This intervention also costs very little. The materials needed for the activities are easily found in most offices or at discount stores. It can also be implemented almost anywhere. A computer with an Internet connection and enough space for group members are the main requirements. If an individual lacks Internet access, only the videos would be missing and the presentations can stand without these. However, this was not specifically examined in this study.

In sum, this is an intervention that has been indicated to promote physical activity among individuals diagnosed with SMIs that is low cost, effective, and easily accessible to group leaders and participants alike.
APPENDICES

Appendix A

Semi-Structured Interview Guide

1. What does goal-setting mean to you?
2. What can you tell me about self-talk?
3. What do you know about visualization?
4. What does energy regulation mean to you?
5. If you had a friend who wanted to go for a walk every morning and he was having trouble following through, what advice would you give him?
Appendix B

Exercise is good for us but making ourselves do it can be REALLY difficult!

If you are diagnosed with schizophrenia, schizoaffective disorder, psychotic disorder not otherwise specified, or schizophreniform disorder and would like to learn about different ways to motivate yourself to get more physically active, you may be interested in this research project!

What does it involve?
Attendance at six weekly, 60 minutes sessions to learn about different ways you can motivate yourself to exercise and meet your fitness goals.

4 assessment meetings with the Co-Investigator to complete paper and pencil questionnaires and answer some questions about your physical activity. After each of these 4 assessment meetings you will receive $10, cash and if you attend all four sessions, you will receive a $20 bonus. In total, you can earn up to $60 by participating in this study.

This study is being conducted at the Massachusetts Mental Health Center under the supervision of Beth-Israel Deaconess Medical Center.

What’s the point?
This project is looking at the effect of these groups on the physical activity levels of participants.

What’s in it for me? Are there risks?
You’ll learn new skills to help you get moving! This is a minimal risk study. You may be uncomfortable answering questions and speaking out in a group, but you will always have the opportunity to “pass” in these situations. You may also feel out of breath or experience achy muscles during the 6 minutes of walking assessments.

What do I do if I’m interested in participating?
Contact Lynn Coleman at 724-816-5506 or LynnColeman125@gmail.com to set up a meeting to learn more.
Appendix C

Good morning! My name is Lynn Coleman and I’m here to talk to you briefly about a research opportunity. I’m talking to you because you’re attending this health and wellness class focusing on nutrition and physical health and the research opportunity I’m going to talk about is related to health and wellness as well.

Starting in June a class focusing on building skills to motivate people to participate in exercise is going to be held here at the Center. The purpose of this class is to increase the amount of physical activity people are engaging in by teaching them skills they can use to motivate themselves.

I’m looking for people who would be willing to take the class, six 60 minute sessions, and meet with me four additional times to complete a short exercise assessment, an interview about mental skills, and a few brief questionnaires. While you will receive no compensation for the six classroom sessions, you will receive $10 for meeting with me the four additional times to complete the assessments.

The information I gather from these meetings will be confidential. I will code your materials to keep your identity anonymous. When I write the report to talk about the study results, your identity will remain private.

Whether or not you participate in this study will not affect the treatment you receive at MMHC. If you decide to attend the class but not participate in the research study, that’s perfectly fine. If you decide to skip the class and the research, that’s also fine. If you decide to attend the class and participate in the research project, that’s also perfectly fine. Your decision about this project will not change the care you receive at
MMHC. Also if you decide to participate in the research and change your mind at any point, I will simply destroy the materials associated with your private code and remove you from the study but you will still be welcome to participate in the class if you choose.

If anyone is interested in learning more about participating in the study you can talk to me after this session or you can reach me via email or phone at LynnColeman125@gmail.com or 724-816-5506.

Thanks so much for listening!
Appendix D

Session Objectives and Activities

MMHC Group #1 Intro Presentation

- Group members will understand the purpose of this group – to help them identify fitness goals IMPORTANT TO THEM and to help them learn ways to motivate themselves towards those goals (goal-setting, visualization, self-talk, and energy management)

- Group members will learn, via discussion of the “tower activity” how to think about the resources they have available and how they relate to their goals

*Games: Tower Activity – group members will work together to create the tallest structure possible with the materials given (yarn, paper towel rolls, jars, markers, etc.)

MMHC Group #2 Goal-Setting

- Group members will identify a goal that is important to them that is also SMART
- Group members will learn to distinguish between “SMART” and “squishy” (inadequate) goals
- Group members will begin to understand how to look at a big (long-term) goal and break it down into smaller pieces (what can you do this week?)

*Games: Play Dough/SMART Cards – group leader identifies different goals and in response, group members squash their play dough or hold up a SMART card, depending on whether the goal is SMART or squishy
  - Balloon with squishy goals written on it – balloon is batted between group members while music plays, when the music sops, the last person to touch the balloon picks a goal and changes the goal so it can be SMART-er

MMHC Group #3 Visualization

- Group members will learn how to use their senses to recall experiences related to their goals
- Group members will learn that visualization can be used to help them recall positive feelings but also to predict and plan for obstacles (i.e., I know I won’t feel like going to the gym in the morning – my bed will be warm and comfy, I’ll feel sleepy – so when I wake up, the first thing I’ll do is reach out from my bed and turn on the light…)
*Games: Lego ID, group members familiarize themselves with a Lego piece, using their sense of touch, before putting it back into a bag and trying to relocate it without looking
  o Scene Recall, group members take 1–2 minutes, to look at various scenes displayed in the PowerPoint presentation and are then asked to recall as many details as they can from the picture, anchoring themselves by their senses

MMHC Group #4 Self-Talk

- Group members will learn to distinguish between helpful thoughts/unhelpful thoughts
- Group members will practice clobbering unhelpful thoughts by focusing on realistic and true but more helpful thoughts
- Group members will identify a helpful thought that speaks to them and commit to using it when they encounter unhelpful thought

*Games: Basketball, write unhelpful thoughts on sheets of paper, group members take turns reading the unhelpful thoughts, clobbering them with more helpful thoughts, then crumpling the paper and shooting it into the trash can

  o BINGO, distribute BINGO cards with unhelpful thoughts written in each box, each time an unhelpful thought is called by the group leader, group members mark that box and take turns clobbering it with a more helpful thought
  o Paper Pass, Unhelpful thoughts are written at the tops of sheets of paper, group members each start with one sheet and write down the thought they would use to clobber the unhelpful thoughts, group members then pass the paper to the left or right and the next group member contributes – in the end the group has generated a list of more helpful thoughts to clobber several common unhelpful thoughts
    • To emphasize this point even more, the group leader can add the helpful thoughts generated by the group into a Fortune Teller to hand out the following week so group members have a tangible reminder of the helpful thoughts they worked together to generate
MMHC Group #5 Energy Management

- Group members will recognize how some of the other skills taught (visualization and self-talk) can be used to boost their energy
- Group members will learn different ways to boost their energy levels when it’s time to exercise

* Games: Scene Search, group members together look at a cartoon scene and identify, based what they see in the picture, different ways the cartoon character could use his resources to boost his energy
  - Paper Airplanes, group members work together to follow directions and build paper airplanes, thus “engaging their brains” and hopefully “smiling and laughing” which are two different ways to boost energy
  - Laughing Activity, group leader prompts group members to do different silly things – introduce themselves in funny voices, develop a signature silly laugh and try to imitate the silly laughs of others, silly walks, and trying to make the noise a dolphin makes – all to demonstrate how laughter can boost energy

MMHC Group #6 Skills Review

- Group members will review each skill learned throughout the group series (goal-setting, visualization, self-talk, and energy management

* Games: Group leaders can choose games from each of the skill sessions above; additionally Fitness Pictionary is great for Visualization
Appendix E - Interview Scoring Guide

Goal-Setting

*SMART components: specific, measurable, attainable, relevant, time specific

*Definition of a goal or Goal-Setting: something a person is trying to do or achieve; identifying an objective and establishing a plan to reach it

Definition of a goal or Goal-Setting – 1
Example of a goal – 1
Referencing a SMART component – 1
Referencing the SMART concept itself – 1

Self-Talk

*Self-talk definition: the ongoing internal conversation with ourselves, which influences how we feel and behave

Definition – 1
Example of self-talk – 1
Differentiating between helpful/unhelpful (+/-) – 1

Visualization

*Visualization definition: the process of creating a mental image or intention of what you want to happen or feel)

Definition – 1
Example of visualization – 1
Explanation of how to use the technique by focusing on senses – 1
Explanation of how to use the technique in terms of different purposes – 1
Energy Management

*Energy management/regulation definition: bringing your energy up (or down) to the level that is going to allow you to be most successful – to function optimally

*Examples: listen to music to get motivated; chew gum to feel more awake; stretch to get your blood flowing/energy up

Definition – 1

Energy management example - 1

Advice

*Abstractly: offers an example of self-talk, visualization, etc. but doesn’t name it as such (e.g., I would tell him to tell himself that he’ll feel better afterwards)

*Specifically: names one of the above strategies (e.g., I would tell him to use self-talk)

Understands question and aims to help struggling individual – 1

References 1 of the above strategies abstractly – 1

References 1 of the above strategies specifically – 1
Appendix F – Additional Measure Information

1) Rapid Assessment of Physical Activity (RAPA)

References:


2) World Health Organization, 8, Quality of Life Scale (WHO8)

References:


http://www.euro.who.int/__data/assets/pdf_file/0015/101193/WA9502003EU.pdf
Appendix G

Figure 1. RAPA Q-Q Plot, Assessment Point 1

Figure 2. RAPA Q-Q Plot, Assessment Point 2
Figure 3. RAPA Q-Q Plot, Assessment Point 3

Figure 4. RAPA Q-Q Plot, Assessment Point 4
Figure 5. Interview Q-Q Plot, Assessment Point 1

Figure 6. Interview Q-Q Plot, Assessment Point 2
Figure 7. Interview Q-Q Plot, Assessment Point 3

Figure 8. Interview Q-Q Plot, Assessment Point 4
Figure 9. WHO8 Q-Q Plot, Assessment Point 1

Figure 10. WHO8 Q-Q Plot, Assessment Point 2
Figure 11. WHO8 Q-Q Plot, Assessment Point 3

Figure 12. WHO8 Q-Q Plot, Assessment Point 4
Figure 13. Group Attendance Q-Q Plot

Figure 14. Consumer Satisfaction Q-Q Plot
Figure 15. RAPA Scores Per Participant Over Time
Figure 16. Interview Scores Per Participant Over Time
Figure 17. WHO8 Scores Per Participant Over Time
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*Note: R – RAPA; I – Interview; W – WHO8; C – CGI; *denotes significance at .05 level; **denotes significance at the .001 level
REFERENCES


Rehabilitation. 9(1), 121–124.


CURRICULUM VITAE

Lynn Lemcke Coleman

Personal Information
Home Address:
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Education
Ed.D., Counseling Psychology, 2010-2015, Boston University, Boston, MA
Dissertation Title: Promoting Physical Activity Among Individuals Diagnosed with Serious Mental Illnesses: Testing a Skills-Based Curriculum
Advisor: Steven N. Broder, Ph.D.
M.A., Counseling Psychology, 2010, Boston College, Chestnut Hill, MA
B.A., Psychology, 2008, Northeastern University, Boston, MA
    Major: Psychology, Minor: Political Science

Honors
2004-2008    Northeastern University’s Dean’s Scholarship Recipient
2008-2010    Boston College’s Merit Based Scholarship Recipient
2010-2013    Boston University’s Merit Based Scholarship Recipient
01/2014      Graduate Research and Scholarship Award Recipient
11/2014      National Psychologist Training Register Credentialing Scholarship Recipient

Clinical and Research Interests
Clinical interests include children, adolescents, and families facing a wide range of challenges including but not limited to adjustment struggles, sexual identity difficulties, anxiety, depression, PTSD, disordered eating, substance abuse problems, relationship troubles, self-injury, organizational/time management problems, academic difficulties, and social skills challenges.

Current research interests include healthy behavior promotion and the therapeutic benefits of exercise.

Clinical Experience
August 2014-Present
Psychology Intern at the Will County Health Department. The Acute Community Services department offers individual therapy as well as psychiatry to unfunded individuals recently discharged from psychiatric hospitalizations. Interns at WCHD also provide support to the Federally Qualified Community Health Center associated with the county by offering brief individual therapy to referred patients, assessing patients for safety when physicians are concerned about their stability, and connecting these patients to resources in the community. WCHD Interns also conduct screenings in local emergency rooms for unfunded individuals in
need of assessment to determine if hospitalization is necessary and to coordinate their continued care regarding the disposition. Psychological testing is also conducted by Interns. Referrals for testing come from Child and Adolescent Services, Forensic Services, and Adult Behavioral Services. Supervisor: Anthony DeJoseph, PsyD.

**July 2013-June 2014**  
Psychology Extern on the Community Based Acute Treatment Unit at Franciscan Hospital for Children. Individual and group therapy are provided to children and adolescents (ages 4-15) who are stepping up from the community or down from an inpatient hospitalization for stabilization, family work, and coping skill development. Cognitive Behavioral Therapy and Play Therapy are the most common treatment modalities employed. The majority of the patients have significant trauma histories; aggressive out of control behaviors; and/or suicidal/homicidal ideation. Supervisor: Kristine Hodshon, PsyD.

**July 2012-June 2013**  
Psychology Trainee at the Prevention and Recovery in Early Psychosis (PREP) Clinic. PREP is a comprehensive outpatient treatment center that provides individual and group therapy as well as case management, psychiatry, and family work. Clients are between the ages of 16 and 25 and have recently experience their first episode of psychosis. Cognitive Behavioral Therapy and Acceptance and Commitment Therapy were the primary orientations. Testing experience includes the administration of the MATRICS (Measurement and Treatment Research to Improve Cognition in Schizophrenia) battery and several diagnostic measures. Supervisors: Jude Leung, Ph.D. and Michelle Friedman-Yakoobian, Ph.D.

**Oct. 2010-June 2013**  
Therapeutic Mentor for Vive Family Support Program, working with adolescents and adults ages 12-35 struggling with a variety of difficulties including but not limited to adjustment to college, substance abuse, anxiety, time management, effective communication, and social skills. Both individual and family therapy were conducted. Supervisor: Josh Carpenter, Ed.D.

**Dec. 2008-June 2010**  
School Adjustment Counselor Intern at the Dr. Robert G. O’Donnell Middle School (OMS) in Stoughton, Massachusetts. This public middle school serves a diverse population in terms of socioeconomic status and ethnicities. Individual and group therapy were provided, as well as consultation with teachers, the Student Support Team, and the disciplinary team. Supervisor: Daniel Hoy, Ed.D
Professional Academic Experience
Jan. 2012-May 2013 Graduate Assistant to the Practicum Coordinator for the Master’s Counseling Psychology Program. This position was developed to establish relationships with local mental health providers and provide supervision to Master’s students as they applied to and completed their pre-practicum and practicum experiences. Supervisor: Jan Parson, M.A. and Kimberly Howard, Ph.D.

Dec. 2011-Feb. 2012 Boston University Faculty Search Committee Student Member. This position was developed to serve as a liaison between the student body and the administration by participating in search committee meetings and interviews with potential new faculty members.

Research Experience
Jan. 2009-Dec. 2009 Research Assistant at Consumer Quality Initiatives (CQI). CQI is a research, evaluation, and quality improvement organization based in Massachusetts. CQI works to improve mental health resources for consumers by speaking directly with consumers of those services and advocating for changes based on this research. Supervisor: Jon Delman, Ph.D., J.D., MPH

Relevant Work Experience
Sept. 2007-Dec. 2008 Castle School Teacher’s Aid and Residential Counselor. The Castle School was a therapeutic residential high school serving adolescents diagnosed with major mental illnesses. The Teacher’s Aid supported students in the classroom, mediated conflicts, and taught occasional lessons. The Residential Counselor maintained the daily schedule of the school, provided assistance in crisis situations, and worked with students on symptom management.

June 2007-Jan. 2008 Mental Health Specialist on the Dialectical Behavior Therapy Unit for Adolescent Girls diagnosed with Borderline Personality Disorder. The Mental Health Specialist supported patients in practicing DBT skills on the unit and in the community, encouraged positive interactions between patients and staff, collaborated with clinicians to execute safety and behavioral plans, and documented patient behavior in accordance with unit protocols.

Service Experience
July 2006-June 2008 Group Leader on the Acute Residential Treatment Unit for Adolescent Girls at McLean Hospital. This position was developed to provide the patients with therapeutic and stimulating activities in the evening when groups for the day were over. In this case, that activity was a weekly Journal Group in which the
patients responded to writing and drawing prompts, shared their ideas, and focused on their strengths.

July 2006-June 2008 LoveLane Therapeutic Horseback Riding Aid. LoveLane serves children and adolescents struggling with physical and mental impairments through horseback riding. The Aid provides support to both the student and instructor throughout the lesson.

**Noteworthy Skills**
Trauma Focused Cognitive Behavioral Therapy (TF-CBT) Certified; Child and Adolescent Needs and Strengths (CANS) Certified; First Aid/CPR Certified

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Stoughton, MA 02072
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