MOTIVATION AND ADHERENCE TO EXERCISE IN COLLEGE STUDENTS WITH SCHIZOPHRENIA

A Thesis
Submitted to the
Temple University Graduate Board

In partial fulfillment
Of the requirements for the degree
MASTER OF SCIENCE

By
Haley Knotts
Diploma Date December 2018

Thesis Approvals:
Dr. Michael Sachs, Thesis Advisor, Department of Kinesiology
Dr. Lois Butcher-Poffley, Department of Kinesiology
Dr. Gretchen Snethen, Department of Rehabilitation Sci

ABSTRACT

The purpose of this study was to explore and define the behavioral and thought processes that affect exercise engagement and adherence in college students with schizophrenia. A mixed methods approach was proposed utilizing an online survey followed by semi structured interviews. The online survey used was the Exercise Benefits and Barriers Scale (EBBS) Adult Version and the semi structured interview questions were produced by the researcher. The potential participants for this study were students who were 18 years of age or older and registered with the Disability Resources and Services Department at Temple University. The participants were also to have already experienced their first episode of psychosis (FEP).

The online survey yielded no completed questionnaires. The online survey consisted of the 43 question EBBS Adult version and a basic demographic questionnaire. The EBBS utilized a 4-point Likert scale ranging from 'strongly disagree' to 'strongly agree.' At the end of the survey, an optional question was added if participants wanted to take part in a semi-structured interview.

The semi-structured interview also yielded no participants. Interviews were designed to develop a more in depth understanding of personal schizophrenia symptoms, how well symptoms are managed by the individual, and how exercise plays a role in their management. Interviews were to be transcribed verbatim and coded using transcendental phenomenology theory to explore the phenomenon of exercise adherence and non-adherence.

Considering the lack of responses, social stigma surrounding mental illness could be a contributing factor. Discrimination surrounding mental illness has been shown to

lower quality of life for individuals with a mental illness, increase unemployment rates, and increase anxiety and depression rates. Another protentional contributing factor to low survey completion rate was the length of the EBBS.

The population diagnosed with schizophrenia could benefit from research involving a six month exercise implementation. The EBBS or a shortened modified version could be utilized in pre and post testing along with exercise testing in the pre and post form analyzing the five areas of physical fitness. Semi-structured interviews would be beneficial to do prior, during, and at the end of the exercise intervention to acquire a well rounded view of the perceptions of exercise engagement. A follow up survey and interview would be completed after two months to examine continued or discontinued exercise engagement and the associated reasons.

A case study or narrative research would be a second beneficial study. One or two participants who currently engage in exercise and are considered in the maintenance stage of behavior change would be followed and interviewed over the course of a year or longer. It would be valuable to examine a participant who is currently engaged in exercise since this is a phenomenon in this population. A qualitative research approach would give better insight into how these individuals perceive exercise, exercise barriers, or current and past exercise motivators. This in turn can better mold future research designs and exercise implementations to address the exercise motivation obstacle in people with schizophrenia.

ACKNOWLEDGEMENTS

Firstly, I would like to thank the continual support of my friends family. I am very blessed to have come from a large family that has showed me so much love and understanding throughout the years. They provided me with emotional support that I needed to get through the long nights of studying and writing papers. Most importantly, I want to thank my brother, Cole, and my parents Scott and Chrissie, for pushing me to do bigger and better things and to strive for more. I would not be the strong independent woman that I am today without them.

I'd also like to thank my advisor Dr. Michael Sachs. Many revisions went into writing and preparing this thesis and Dr. Sachs directed me along the way with his wisdom. I would also like to extend thanks to all my peers and professors at Temple University, the College of Public Health, Dr. Aaron Specter and the Disability and Resources department, and my thesis committee members Dr. Lois Butcher-Poffley and Dr. Gretchen Snethen for their continued help in the development of my thesis.

Lastly, I'd like to thank my professors from Slippery Rock University, for giving me a great education to build on, with special thanks to my undergraduate advisor Dr. Beth Larouere for motivating and believing in me when I didn't want to believe in myself. Dr. Laurie was the driving force behind me coming to grad school and choosing Temple University. She encouraged me through very difficult semesters and gave me tough love when I needed to hear it. I would also like to personally thank Dr. Kimberly Smith, for always listening to my strengths and struggles and being a part of my wonderful support system through my education.

TABLE OF CONTENTS

Page

CHAPTER 1

INTRODUCTION

Exercise has shown to have several benefits to one's physical and psychological health, which makes studying motivation and adherence to exercise an important pursuit. Previous research has shown that exercise acts as a mood enhancer, decreasing anxiety and stress by increasing the levels of serotonin and endorphins in the brain (Zschucke, Gaudlitz, & Strohle, 2013). Exercise can also increase levels of the brain deprived neurotropic factor (BDNF) which has profound effects on cognitive function such as improving memory, quickening memory retrieval time, attentional process and social cognition (Firth, Cotter, Carney, & Yung, 2017; Zschucke et. al., 2013). This is extremely important for people with schizophrenia, who have decreased cognitive function that antipsychotics have no positive effect on (Firth et. al., 2016). To people with schizophrenia, exercise has also shown to decrease the positive symptoms associated with the illness, such as hallucinations and hearing voices (Firth et. al., 2016).

The first episode or 'break' often occurs between the ages of 16-30 (Schizophrenia, 2016). This age range is also typically when people in the United States are leaving high school and entering higher education. One in three college freshman reported mental health problems within the last year, with a decrease in GPA (Bruffaerts et. al, 2018). A consequence of this is the rising number of young adult suicides, the second leading cause of death in this population (Martin, 2017). The importance of combating mental illness at this age is extremely important. College students with mental illnesses are twice as likely to drop out of college, obtaining no degree and perhaps furthering stress in later adult life (Bruffaerts et. al, 2018). While there is some research

investigating mental health as a whole at the college level, there is a severe lack of research on people with schizophrenia at the college level, particularly into motivation and adherence to exercise. Investigating the population with schizophrenia who are also attending college and in the range of 16 to 30 years of age is an extremely important, as this time frame can set behavioral patterns for later in life.

People with schizophrenia are often prescribed antipsychotics, which has a prevalence to increasing the risk of cardiovascular disease and promoting weight gain (Vancampfort et. al., 2012). A lack of exercise can lead to obesity, which in turn can cause cardiorespiratory diseases and sometimes death. The population living with a mental illness, such as schizophrenia, are at an increased risk for disease and obesity (Roberts & Bailey, 2011). This population is also at an increased risk for morbidity and mortality (Roberts & Bailey, 2011). Therefore, for people living with schizophrenia, it is increasingly more important to exercise regularly to prevent diseases and mortality. However, people with schizophrenia have an increased lack of adherence and motivation to any exercise program (Roberts & Bailey, 2011). This can be due to a multitude of factors, including depressive effects of schizophrenia and antipsychotics, lack of education, and a societal stigma associated with the mental illness. Currently, only 25% of people with schizophrenia are meeting the recommended 150 minutes per week of moderate intensity (Vancampfort et. al., 2012). In a recent study, those with mental health problems that did not meet the 150 minutes of moderate intensity per week guideline had lower physical, psychological, social and environmental quality of life (Vancampfort et. al., 2017). It was hypothesized that positive changes in health create positive changes in

wellness and mental health, which then improved the participants social engagement (Vancampfort et. al., 2017).

A common barrier to social engagement and therefore physical activity and exercise is social stigma and discrimination towards people with mental illness, more specifically people with schizophrenia. The name schizophrenia is often associated with aggression and negative emotions (Kavanagh & Banyard, 2013). Media also plays a negative role in the perception of the mental illness. Schizophrenia is often the antagonistic persona in Hollywood films. This undesirable portrayal furthers the discrimination that people with schizophrenia can face daily. Many people who have schizophrenia experience discrimination at the work place, preventing them from obtaining a job (Pescosolido, Medina, Martin, & Long, 2013). Many people also refuse to rent, live next to, or associate with someone who they know has schizophrenia (Pescosolido, et. al., 2013). Isolating people with a mental illness prevents individuals even further from finding help for their symptoms and seeking medical care (Pescosolido, et. al., 2013).

One way to diminish discrimination and prejudice is to change the name of the diagnosis. Current research has shown that switching to a different name other than schizophrenia could prompt people to leave behind automatic cognitive biases associated with the term (Kavanagh & Banyard, 2013). Altering diagnoses terms has been beneficial in the past with anti-stigma campaigns of other medical diagnoses (Kavanagh & Banyard, 2013).

Statement of the Problem

The purpose of this study was to explore and define the behavioral and thought processes that affect exercise engagement and adherence in college students with schizophrenia.

Research Question

The following questions were to be addressed in this study:

1. What are the exercise behaviors in which persons with schizophrenia engage (or do not engage if sedentary)?
2. What are barriers to participating in exercise for persons with schizophrenia?
3. How does exercise behavior affect the quality of life as a student for persons with schizophrenia?

Delimitations

The following delimitations were present in the study:

1. Participants have already experienced their first episode of psychosis.
2. Participants were registered with the Disability Resources and Services (DRS) department at Temple University.
3. All potential participants were at least 18 years old.

Limitations

The following limitations were present in the study:

1. Participants were not randomly chosen; therefore, the results of this qualitative study are not generalizable to the entire population with schizophrenia.
2. Exercise history and current exercise behaviors were to have been self

reported.

3. Participation in this study was voluntary. Participants may not be representative of the general population nor persons with schizophrenia.

Definition of Terms

The following terms were defined in the study as follows:

First stage of psychosis: person who has experienced their first psychotic episode

College-Aged: A person at least 18 years old currently enrolled in classes at university or college.

Schizophrenia: experiencing delusions, hallucinations, disorganized speech and behavior, and other symptoms that cause social or occupational dysfunction (Schizophrenia Symptoms and Other Psychotic Disorders, 2013).

Moderate Physical Activity: 40-60% of Heart Rate Reserve (HRR), hard to breathe but can still easily talk when prompted (Pescatello, 2014).

Vigorous Physical Activity: 60-90% of HRR, harder to breathe and cannot find the breath to talk when prompted (Pescatello, 2014).

Heart Rate Reserve: Heart Rate Max (HRmax) – Heart Rate Resting (HRrest) (Pescatello, 2014).

Heart Rate Max: 220 – age (Pescatello, 2014).

CHAPTER 2

LITERATURE REVIEW

Introduction

The purpose of this study will be to explore and define the behavioral and thought processes that affect exercise engagement and adherence in college students with schizophrenia. The purpose of this literature review is to analyze previous research on: social stigma of schizophrenia, students with mental illness, schizophrenia as a mental illness, antipsychotics and their contribution to health, benefits of exercise on schizophrenia, and exercise prevalence.

Social Stigma of Schizophrenia

Current literature documents discrimination on mental illness across the world. The US surgeon general said that social stigma "constituted the primary barrier" to treatment and recovery of mental illness (Kavanagh & Banyard, 2014). These thoughts and actions can lead those with mental illness to be unemployed, prevent them from seeking medical help, and increase depression and suicidal ideation (Kavanagh & Banyard, 2014). One of the most prominent causes of discrimination is the term schizophrenia. The name has been associated with violence and negative behavior (Kavanagh & Banyard, 2014). There is also a discrimination in how the word is used. Using terms like 'schizophrenic' instead of the person centered term 'person with schizophrenia' emphasis the idea that their mental illness defines who they are as a human being (Person-centered language, n.d.). Mental illness is often portrayed as just 'a bad attitude' and that by simply acting positively one can cure their mental illness; when in fact it is similar to a cold or some type of injury/illness that would be treated by a

primary care physician. By using person centered terms, it relates to the public and to the individual that their illness does not define their life, and that recovery is not only about focusing on their symptoms, but focusing on their strengths as well (Person-centered language, n.d.).

One way that has been hypothesized to challenge the stigma on schizophrenia is to alter the diagnosis name. Altering diagnosis names has already occurred with other diagnosis in the past as part of anti-stigma campaigns (Kavanagh & Banyard, 2014). Originally founded as the Association of Medical Officers of American Institutions for Idiotic and Feeble-Minded persons, the organization has continuously changed their name to become one step ahead of the stigma (Albert, Jacobs, & Siperstein, 2016). Today, this organization is known as the American Association for Intellectual and Developmental Disabilities, and previously known as American Association of Mental Retardation (Albert, et. al., 2016). Once clinical terms have been adapted by the public and used as slang, or when there because an alarming amount of discrimination against a clinical term, there is a significant need to update the nomenclature.

In 2002, a name change for schizophrenia was implemented (Koike et. al., 2015). The name was changed from ‘‘Seishin-Bunretsu-Byo,” mind-split disease, to ‘‘Togo-Shitcho-Sho,’’ integration disorder as a anti-stigma campaign (Koike et. al., 2015). A recent study investigated the long term effects of this name change in 2015. Koike et. al. discovered that the new term, “Togo-Shitcho-Sho,” or integration disorder had fewer negative stereotypes than the previous name; however this new term had more negative stereotyping than depression and dementia (Koike et. al., 2015). The authors concluded

that this could be attributed to the lack of mental health education in the current curriculum (Koike et. al., 2015).

Students with Mental Illness

There are more opportunities for people with mental illnesses to attend college than there have been in the past, with the help of antipsychotics and mood stabilizers. However, students with mental illnesses are twice as likely to drop out of college than peers without a mental illness and those students have reported being affected academically by their disorder (Bruffaerts et. al., 2018). The National Survey of College Counseling Centers found an 8% increase in severe psychological problems in college students utilizing counseling services from 2013 to 2014; 44% to 52% respectively (Campus Mental Health, 2017).The American College Health Association conducted a more recent study in 2016, and discovered that 52.7% of students reported feeling hopeless, and 39.1% felt that this feeling of hopelessness persisted so much that it was difficult to function within the last 12 months (Campus Mental Health, 2017). What is more troubling, is the dramatic rise in suicides, which is the second leading cause of death in young adults (Martin, 2017). These findings are disturbing, and there is an emergent need to research behaviors to decrease these hopelessness feelings in the young adult/college population.

Schizophrenia as a Mental Illness

Schizophrenia is “a chronic and severe mental disorder that affects how a person thinks, feels, and behaves” (Schizophrenia, 2016). It is not a common mental disorder, but the effects of schizophrenia can be debilitating if not managed correctly. With schizophrenia, there are three categories of symptoms: negative, positive, and cognitive.

Positive symptoms come in the form of hallucinations, delusions, thought disorders, and movement disorders (Schizophrenia, 2016). Positive symptoms may make people feel as if they are losing touch with reality (Schizophrenia, 2016). Negative symptoms are defined as reduced expression of emotions or reduced talking (Schizophrenia, 2016). Cognitive symptoms are described as trouble focusing, decreased ability to make decisions, and trouble using information directly after learning. These three categories of symptoms usually emerge between the ages of 16-30 and are known as the first episode of psychosis (FEP) (Schizophrenia, 2016). In order to be diagnosed with schizophrenia, the DSM 5 requires persistence of at least 2 symptoms (delusions, hallucinations, disorganized speech, disorganized behavior or catatonia, and negative symptoms), and at least one has to be a positive symptom (Schizophrenia Symptoms and Other Psychotic Disorders, 2013).

Medication – Antipsychotics and Their Contribution to Health

For people with schizophrenia, there is no cure, but there are different treatments to help manage the symptoms. The first is psychosocial treatments. These treatments help the individual learn how to use coping skills in order to function in their daily life (Schizophrenia, 2016). Another form of treatment that is commonly given with psychosocial treatment is antipsychotics. The most common antipsychotics prescribed to people with schizophrenia are: amisulpride, aripiprazole, clozapine, olanzapine, quetiapine, risperidone, sertindole, ziprasidone, and zotepine (Schizophrenia, 2016).

People with schizophrenia are at a greater risk for obesity (Fogarty & Happell, 2005). This is not only due to a lack of motivation as discussed earlier, but also in part to antipsychotics. Previous research has found that 40% to 80% of people taking

antipsychotics experience weight gain (Vancampfort et. al., 2012). Antipsychotics also increase glucose levels, and cholesterol levels (Vancampfort et. al., 2012). These factors can lead to dyslipidemia, hyperglycemia, hypertension, obesity and are all cardiovascular disease risk factors (CVD). There is already a predisposition to cardiovascular disease in people with schizophrenia, and antipsychotics increase the CVD risk factors (Rummel et. al., 2010). If one is to take this medication, leading an active lifestyle by walking at least 30 minutes per day can decrease the chances of developing CVD by 30-50% (Rummel et. al., 2010). A recent study found that cardiorespiratory fitness had a direct correlation to cognition in schizophrenia (Holmen, Egeland, Andersen, Bigseth, & Engh, 2018). Cognition is a difficult symptom to treat in schizophrenia. Antipsychotics can help manage some symptoms, but can increase CVD risk factors; Exercise can lower these risk factors and has been shown to help cognitive symptoms of schizophrenia (Rummel, Komossa, Schwarz, Hunger, Schmid, Lobos & Leucht, 2010). Perhaps the key to maintaining or increasing cognition in people with schizophrenia is through exercise – specifically cardiorespiratory exercise.

Benefits of Exercise for Schizophrenia Symptoms

Exercise has shown to increase the likelihood of disease when one doesn't engage in exercise, but improve physical health when one does engage in exercise (Firth et. al., 2016). Exercise also plays a major role in mental health. Fogarty and Happell mentioned in their systematic analysis (2005) a study by Conrol et. al. In this study, Conrol et. al. observed significant psychological improvements in psychiatric patients who were involved in daily exercise for a week (Fogarty & Happell, 2005). Exercise is particularly important in people with schizophrenia; this population is at an increased risk for obesity

and developing cardiovascular disease (Firth et. al., 2016). Exercise has a strong relationship with fewer negative symptoms and improved cognition (Firth et. al., 2016).

In a study by Firth et. al. (2016), they found that exercise could provide relief from the positive symptoms of schizophrenia. They describe exercise as, "a platform to reconnect to reality" (Firth et. al., 2016) because positive symptoms are usually seen as disconnected from reality. The participant's hallucinations dwindled because the moderate to high intensity exercise required their full attention (Firth et. al., 2016). In another study, there was a reported 92% decrease in the occurrence of hallucinations for people with long-term schizophrenia when exposed to an exercise program (Vancampfort et. al., 2012). Vancampfort also discovered that the exercise was found to be a valuable coping mechanism. When first experiencing psychosis, people can have a hard time dealing with the symptoms. They often experience depression and feel a sense of discrimination from society. Exercise can be a valuable coping mechanism to deal with the life changing symptoms and can help build a higher resilience to emotional battles (Vancampfort et. al., 2012). While there has been research that has found that moderate to high intensity exercise and partner exercise increases exercise motivation, there have been no studies that have combined the two ideas together to examine the effectiveness on adherence and motivation.

In general, exercise has been shown to decrease depression (Zschucke et. al., 2013). Exercise increases production of serotonin and endorphins, which promotes feelings of happiness (Zschucke et. al., 2013). Exercise has also been shown to increase hippocampal volume, which increases memory function (Zschucke et. al., 2013). This is an important effect of exercise for people with schizophrenia. This population suffers

poor memory as a result of cognitive symptoms. Also, exercise has been shown to increase the presence of brain deprived neurotropic factor (BDNF). This factor has neurotropic and neuroprotective effects (Zschucke et. al., 2013). Exercise in general can also help decrease the chances of developing Cardiovascular Disease (CVD), which as stated earlier is a sought after effect in people with schizophrenia, since they have an increased risk in developing these diseases.

In addition to psychological benefits, it is generally accepted that exercise can improve physical health. Participating in physical activity can decrease blood pressure, decrease blood lipid levels, and improve body composition (Vancampfort et. al., 2012). While the benefits of exercise have been explored in great depth, few mental health facilities and few primary care physicians prescribe exercise or give their patients exercise counseling.

Vancamfort et. al. (2012) mentioned in his systematic review that negative symptoms of schizophrenia were one of the more frequent causes of a lack of adherence to exercise, but exercise could help to alleviate these symptoms. People with schizophrenia have an increased problem with exercise adherence (Roberts & Bailey, 2011). Another narrative systematic review was conducted to examine incentives and barriers for exercise in this population (Roberts & Bailey, 2011). Roberts and Bailey searched a large variety of data bases, looking at published and unpublished studies from 1996 to 2009. They found that no study specifically explored incentives and barriers, but some studies reported potential barriers and incentives that were discovered during their research (Roberts & Bailey, 2011). This fact is problematic in its own. In over 20 years, there has not been one study to examine how to motivate people with schizophrenia to

exercise. This means that in studies where they examined the effects of exercise in this population, there was no investigation at the participants after the exercise intervention. This thought is validated by Roberts and Bailey (2011).

In the 14 studies that Roberts and Bailey (2011) discovered, peer support, educational classes, encouraging staff, and an increase in self-efficacy were effective incentives for exercise. In one study Roberts analyzed, a group of individuals remarked that after they left the inpatient facility, it was unlikely they would exercise again because it was not mandatory, even though they enjoyed it (Tetlie, Heimsnes, & Almyik, 2009, as cited in Roberts & Bailey, 2011). There was competition and a 'push' that going to a gym by themselves could not replicate. There was also a statement that the participants at one treatment facility "would like to build choice and variety into healthy living interventions," (Roberts & Bailey, 2011, p. 14). The participants enjoyed the structure, variability, independence, and ability to build relationships that their exercise program allowed.

The reported barriers in Roberts and Bailey's (2011) systematic analysis were illness-related factors. These included: low self-esteem and low confidence, sedation caused by medication, and weight gain. Interestingly enough, the barriers that these participants expressed can all be aided by exercise, excluding sedation from medication. Perhaps a barrier is a lack of knowledge; the individuals with schizophrenia who do not exercise do not have the proper resources to understand how they can benefit from exercise. This thought and the previous incentive of social support suggest that a combination of group exercise and education could improve adherence and motivation in

people with schizophrenia, which is a future study design that Roberts and Bailey suggested (2011).

In a study conducted by Firth et. al. (2016), they examined what deters people with schizophrenia from exercising, and what the benefits were for people with schizophrenia if they did exercise. The participants were all experiencing their first episode of psychosis (FEP) and receiving care from a treatment facility in the United Kingdom. Firth et. al. implemented a 10 week individualized exercise prescription. The exercise sessions were supervised and held twice per week, either in groups or individually depending on the participant's preference. This was a study using qualitative grounded theory, and thus several themes emerged to describe barriers and determinants that people with schizophrenia suffer. The study found that, in their subject pool, social support was consistently identified as a motivator for exercise (Firth et. al., 2016). Having an exercise partner could move them from a pre-contemplation and contemplation phase to action, based on the transtheoretical model of behavior change.

In Fogarty and Happell's (2005) study, they also find the research on motivation and exercise in this population to be limited. They suggest further research with a large group of participants with an individualized exercise plan focusing on cardiovascular fitness and strength, and looking at quality of life and subjective well-being and motivation (Fogarty & Happell, 2005). This study is also supported by Roberts and Bailey (2011) in their narrative synthesis, although they suggest a group design rather than an individual exercise plan.

It is evident that there are potentially many factors that prevent this population from exercising, and understanding these factors in great detail will better help to

facilitate an exercise program that can be adhered to. While this population also suffers from an increased risk of cardiovascular disease, studying ways to motivate and increase adherence to exercise in this population should be a top priority (Vancampfort et.al., 2012).

Exercise Prevalence

Unfortunately, based on data collected by Exercise is Medicine (EIM), a global healthcare initiative to combine exercise into healthcare, 40% of United States primary health care providers do not meet the recommended physical activity guidelines provided by the American College of Sports Medicine (ACSM) (Exercise is Medicine, 2012). In addition, doctors who are physically inactive are less likely to prescribe physical activity to their patients (Exercise is Medicine, 2012). Similarly, only 34% of US adults reported receiving exercise counseling at their most recent physician visit (Exercise is Medicine, 2012). This is an extremely important issue, considering the vast amounts of evidence supporting the benefits of exercise on health.

In a recent research study, investigators explored the exercise habits of people with schizophrenia experiencing FEP (Deighton & Addington, 2014). The average age of the participants was 19.8 in the FEP group and 19.1 in the control group (Deighton & Addington, 2014); the participants were also all university students. Participants experiencing FEP were citing concerns about their body as barriers to exercise more often than the control (Deighton & Addington, 2014). FEP participants were also more likely to avoid exercise engagement due to inability of reaching goals in the past, and more concerned about weight gain (Deighton & Addington, 2014). Deighton and Addington (2014) also discovered that the FEP participants, unlike the control

participants, fell below the Canadian Physical Activity Guidelines. This supports other research involving inactivity and barriers to exercise for people with schizophrenia who are further along in their diagnosis.

Interestingly, individuals experiencing FEP have lower fitness levels than individuals without schizophrenia (Gretchen-Doorly, Kite, Subotnik, Detore, Ventura, Kurtz, & Nuechterlein, 2012). When compared to national age and gender based norms in the United States, people with schizophrenia experiencing FEP scored at the 50th percentile or lower for muscular strength, muscular endurance, flexibility, and cardiovascular fitness (Gretchen-Doorly, et. al., 2012). Researchers did find that there was a non-significant correlation that people who were further along in their diagnosis had worse cardiovascular health (Gretchen-Doorly, et. al., 2012). These findings mirror other studies of poor fitness levels in FEP and individuals who are further along in their diagnosis. Researchers commented that their findings indicate exercise intervention could possibly be more beneficial in the early stages of schizophrenia (Gretchen-Doorly, et. al., 2012). However, combined with the increased perceived barriers to exercise in FEP patients, perhaps exercise intervention would be more beneficial in those with a risk factor of developing schizophrenia, before a FEP occurs. Introducing exercise in the earlier stages of human development, such as elementary school ages, could help prevent exercise non-adherence.

In Vancampfort et. al.'s (2012) study, he discovered that only 25% of people with schizophrenia meet the recommended 150 minutes per week of moderate intensity. Compared to 62% in a non-psychiatric group, only 30% of people with schizophrenia were classified as regularly active (Vancampfort et. al., 2012). Exercise is not usually

administered in treatment facilities for mental illness. If exercise is a part of the program, it is usually not individualized, with the intensity usually being low to moderate (Wattles, 2001). Firth et. al. (2011) discovered in their study that higher intensity exercise sessions are more beneficial to reduce the prevalence of positive symptoms. Exercise sessions are also usually led by a nurse, not an exercise professional who is trained to handle special populations (Wattles, 2001). The lack of exercise prescription in mental health facilities and the low qualifications of specialists who oversee exercise programs for people with mental illness is a perfect cocktail for nonadherence.

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this study was to explore and define the behavioral and thought processes that affect exercise engagement and adherence in college students with schizophrenia. The Methodology is presented in the following sections: research design, participants, instrumentation, bias statement, demographics, and data analysis.

Research Design

This research design offered a mixed methods approach to explore the behavioral and thought processes that affect exercise engagement and adherence in college students with schizophrenia. A demographics survey was administered via email to students who are registered with the Disability Resources and Services (DRS) department at Temple University to determine eligibility for this study, including their diagnosis and when they experienced their first episode of psychosis. Following the demographics survey, the Exercise Benefits/Barriers Scale (EBBS) Adult Version was sent via email. Participants were also asked if they would be willing to participate in an in-person interview. The participants that selected this option were to be interviewed following a semi-structured interview protocol.

Participants

Participants were gathered through the DRS department at Temple University. The sample size was limited to the 10 participants who were registered with DRS with a diagnosis of schizophrenia. Participation in this study was voluntary; possible participants were sent a demographic survey to determine their eligibility in the study. All

participants were to be at least 18 years of age, and were to have already experienced their FEP.

Unfortunately, none of the 10 individuals chose to respond to the survey invitation, and so no data were able to be gathered for potential data analysis.

Instrumentation

Participants were sent a demographic survey via email to determine their mental health diagnosis, age, and current physical activity level. The demographic survey was developed by the researcher for this study and is presented in Appendix B.. These factors helped determine eligibility for this study. Student status was also assessed on this demographic questionnaire, including expected graduation date, program of study, and self-reported GPA.

Eligible participants were then sent via email The EBBS (presented in Appendix C). The EBBS is a 43-item Likert scale ranging from strongly agree to strongly disagree and is validated and reliable at assessing exercise benefits and barriers (Farahani et. al., 2017). Participants also had the option of selecting to do an in-person semi structured interview at the completion of the survey. Participants were offered a $10 gift card to the Philadelphia Pretzel Factory upon completion of the survey. The online survey yielded no responses.

Semi Structured Interviews

Participants who selected that they would be willing to participate in an in person semi structured interview were to be contacted through email. Arrangements were to be made with each individual participant to select a date, time, and location for the interview. Semi structured interviews would have allowed the conversation to flow

organically. Individuals who completed the questionnaire would have been given an additional $10 gift card to the Philadelphia Pretzel Factory. The questions that were to be used in the semi structured interview are presented in Appendix F and were created by the researcher for the purpose of this study. The semi structured interviews also had no participants.

Bias Statement

I am a 23-year-old Caucasian female graduate student in the Psychology of Movement Master's program in the Department of Kinesiology at Temple University. I have played lacrosse for 12 years, playing in high school and in college. My bachelor's degree was in Exercise Science from Slippery Rock University. For our required classwork, we studied exercise prescriptions and complications for special populations, taught a group fitness class, and developed our own exercise prescriptions for multiple clients who were extremely diverse. Continuing my education at Temple University, I have been exposed to more psychology theories and coursework. I have always been passionate about mental health, but I have grown more passionate about this issue from taking classes in Counseling Psychology and from the courses my program offers.

I am currently a Mental Health Technician at a children's behavioral health psychiatric hospital. Patients present with symptoms of suicide ideation, homicidal ideation, self-injurious behaviors, aggression, and auditory and visual hallucinations. I truly enjoy going into work every morning to work with the patients.

From this unique background, I found myself intrigued by the concept of exercise motivation and adherence. While I do not have any family members who have schizophrenia, anxiety illnesses are common in my family. With anxiety being a

symptom of schizophrenia, I can also personally benefit from the results of this study to discover how to effectively motivate myself, and my family members to exercise.

Data Analysis

The EBBS would have been analyzed using IBM SPSS software. Demographics were to be analyzed for frequency of age, school status, and previous exercise habits. Interviews were to be transcribed verbatim and coded using transcendental phenomenology theory to explore the phenomenon of exercise adherence and non-adherence (Creswell, 2012). Transcendental phenomenology analyzes a common phenomenon shared between all participants to develop themes describing the experience. For the purpose of this study, the core phenomenon of exercise adherence and non-adherence was to be investigated. Textural and structural descriptions were to be generated to form an essence of the adherence and non-adherence to exercise (Creswell, 2012). For triangulation measures, interviews were to be analyzed by an additional researcher and then sent back to participants to check for accuracy of information (Creswell, 2012).

CHAPTER 4

RESULTS

Summary

The aim of this present study was to analyze in-depth the exercise engagement and non-engagement behaviors and thought processes for people with schizophrenia. For this study, the proposed outline was to conduct an online questionnaire and then interview those participants who opted for an interview. The interviews were to be transcribed verbatim and analyzed using transcendental phenomenology. With no participants for both the interview and semi structured interview, it may address a common stigma associated with mental illness.

Social stigma is seen around the world affecting people with intellectual or developmental disabilities. Schizophrenia is often more targeted than others, such as dementia or depression (Koike et. al., 2015). This could be because of the low prevalence of schizophrenia in the world (Schizophrenia, 2016). Research has proven that knowledge based anti-stigma campaigning and interaction with people with intellectual and developmental disabilities can reduce negative stereotyping and discrimination (Noyman-Veksler, et. al., 2013). There has been studies investigating how people with schizophrenia react to participating in research. The vast majority had positive feelings and perceptions after being involved in research; however there were feelings of anxiety and nervousness to participate prior to the beginning of the study (Taylor, Awenat, Gooding, Johnson, Pratt, Wood, & Tarrier, 2010). This study reached out to participants in person, possibly making people less hesitant to participate (Taylor, et. al., 2010). Taylor also notes that people with schizophrenia more often participate in qualitative

research; it allows participants to describe the complexity of their experience that quantitative methods do not fully capture (Taylor, et. al., 2010). Perhaps in the future it would be better to schedule interviews first, then use a survey, or possibly not utilize any survey.

Another possible explanation for zero participation is academic schedule. Adjusting to a new schedule, especially as a freshman or transfer student can be extremely stressful. There could have been no time for students to answer the surveys. Students could also not be involved with the Disabilities Resources and Service department at Temple University. Students could have perhaps registered because their diagnosis required them to, but the students would have a delete-reflex when emails from the DRS popped into their inbox.

Third, students could not have valued the incentive. $10 gift card for some students could be seen as not enough money to take the time to fill out a survey. The gift card location could also be an issue. The Philadelphia Pretzel factory could be too specific; some students may not enjoy this fast food chain. Perhaps a more broad incentive, such as a Mastercard or Visa gift card that can be used anywhere.

Contact was attempted three times, however these attempts may not have been at the most appropriate times. Two of the attempts were made during summer session; many students do not check their email during the summer. The third attempt was in the beginning of the semester when many students are trying to figure out their schedule and transition into the new school year. The timing of contact could have severely limited participant engagement. Additionally, there were zero completed responses and 0 in progress responses, meaning no participants began the survey. The link to the survey was

anonymous and did not collect any IP addresses or personal data, therefore it is not possible to determine if a student followed the link and opted out of the survey following the informed consent page.

There is also a possibility that there are more students with schizophrenia at Temple University than those that have registered with DRS. These students could possibly not want to disclose their diagnosis, not know that DRS is available to them, or that it even exists. In addition to sending an email out via DRS, there could have been a larger participant pool if there were additional recruitment options, such as flyers.

Another potential reason for zero participants is the lack of a research organization associated with the study. Other organizations that utilized DRS for participants have had success with participant engagement. Perhaps utilizing one of these research groups at Temple would have increased responses. There could be some hesitation with filling out a survey from someone the participants do not know, even if it is distributed through DRS.

Had there been participants, it is hypothesized that students with schizophrenia would have more perceived barriers to exercise and fewer perceived benefits to exercise than their peers with no history of mental illness. Vancampfort and colleagues found in their study (2012) that only 30% of people with schizophrenia were classified as regularly active. In this sample size, three people would have been expected to report themselves as regularly active. Therefore, it is theorized that participants would self-disclose that they are not very likely to exercise in the next week, and they are not confident in their ability to adhere to an exercise program. Instead of being physically active, participants probably engaged in other common coping mechanisms to deal with

the stress of daily life and schizophrenia symptoms. Some answers to be expected were: medication, substance abuse, listening to music, journaling, taking a break, talking to friends/family, coloring or drawing, watching TV, etc. These coping skills are not unique to those with schizophrenia, but are common coping mechanisms at this particular age group and in the college environment (Bravo, 2018). While these are all adequate forms of coping skills excluding substance abuse, exercise is the most proven coping skill that can manage positive, negative, and cognitive schizophrenia symptoms (Vancampfort et. al., 2012).

Plans for Future Research

The sample size for this study was severely limited with a maximum population of 10 students. Going forward, it would be more beneficial to open up the population size to students with schizophrenia at other colleges in the Philadelphia area. It also could be beneficial to administer the survey to colleges across the country; This is a benefit of conducting surveys online. Given that no students responded, and the issue of social stigma may be a key issue in this result, strategies for addressing this issue need to be developed. Some strategies would include altering the name of schizophrenia to a different term of diagnosis. Current literature has noted that there are negative connotations associated with the term schizophrenia, and that this name carries conditioned biases (Pescosolido, et. al., 2013). The media portrays schizophrenia in a horrific light, adding to the discriminatory actions experienced by people today. There has been success in the past altering the names of other diagnoses for anti-stigma campaigns (Kavanagh & Banyard, 2013).

Another potential strategy for reducing stigma is by using person-centered language. Person centered language is placing the person first and the disability last, and "recognizes the individuality of each person and echoes the notion that each person is deserving of respect (Person-centered Language, N.D.). Using words like 'schizophrenic' instead of 'person with schizophrenia' reinforces negative stereotypes that define a person by their disability, and not embracing people for everything they are.

It could also be beneficial for an exercise intervention to be studied using students with schizophrenia as the population. Pre and post testing would include the EBBS, semi-structured interviews investigating exercise habits and how exercise plays a role in managing schizophrenia symptoms, and fitness testing. Fitness testing would measure the 5 areas of physical fitness: muscular strength, muscular endurance, cardiorespiratory endurance, flexibility and body composition. Current literature shows that a cardiorespiratory program that is individualized and social interaction are two key components for managing symptoms and increasing adherence (Firth, et. al., 2016). Thus, a group exercise intervention with varying modifications for intensity is a promising exercise intervention for people with schizophrenia. Utilizing group exercise classes that are already active on campus would allow students with schizophrenia to keep their anonymity about their diagnosis. This would also encourage social interaction. Following completion of the exercise intervention, a 6 month follow up EBBS questionnaire and interview would be administered to test for exercise adherence.

CHAPTER 5

SUMMARY

The purpose of this study was to explore and define the behavioral and thought processes that affect exercise engagement and adherence in college students with schizophrenia. A mixed methods approach was attempted utilizing an online survey followed by semi structured interviews. The participants for this study were to be students who were 18 years of age or older and registered with the Disability Resources and Services Department at Temple University. The students were to have experienced their first episode of psychosis by the time of participation in this study.

The online survey yielded no completed questionnaires. The online survey consisted of the 43 question Exercise Benefits and Barriers Scale English version and a basic demographic questionnaire. The EBBS utilized a 4-point Likert scale ranging from 'strongly disagree' to 'strongly agree.' At the end of the survey, an optional question was added if participants wanted to take part in a semi-structured interview.

The semi-structured interview also yielded no participants. Interviews were designed to develop a more in depth understanding of personal schizophrenia symptoms, how well symptoms are managed by the individual, and how exercise plays a role in their management. Interviews were to be transcribed verbatim and coded using transcendental phenomenology theory to explore the phenomenon of exercise adherence and non-adherence.

Considering the lack of responses, social stigma surrounding mental illness could be a contributing factor. Discrimination against people with mental illness has affected their employment, social group, housing status, and increased anxiety and depression

(Pescosolido, et. al., 2013). Self-disclosure of a mental illness has the opportunity to lend itself to discrimination, and many choose not to seek medical help because of the increased anxiety of judgement from society. Another potential contributing factor of the lack of responses is the length of the survey.

Conclusions

Unfortunately, the research questions could not be answered because there were no participants in the study. Based on current literature, it is hypothesized that there would be a limited amount of exercise engagement in persons with schizophrenia. Antipsychotics can help manage the symptoms of schizophrenia, but unfortunately they can affect motivation and increase depression (Rummel et. al., 2010). Combining antipsychotic side effects, the social stigma of mental illness, more specifically schizophrenia, and the college culture can be a recipe for non-adherence to an exercise program. College is known to produce some negative behaviors regarding health, such as binge drinking and eating habits (Bravo et. al., 2018). Excessive overeating, undereating, and substance abuse are also issues that can emerge during college years (Bravo et. al, 2018). The environment and social group in which students live in can drastically affect their lifestyle choices.

The current research suggests that exercise engagement can improve the quality of life for persons with schizophrenia (Vancampfort et. al., 2012). Exercise can improve the five components of physical fitness including cardiovascular health, flexibility, body composition, muscular strength, and muscular fitness. Exercise can also improve mental health by improving mood; serotonin and norepinephrine levels increase in the brain, creating a more pleasant mood. More importantly, exercise has been shown to decrease

the positive symptoms of schizophrenia, which is something antipsychotics have not been able to continually and successfully accomplish. Thus, exercise has the potential to be a key factor in the treatment of people with schizophrenia; this is also why it is extremely important to determine what barriers and motivators exist to encourage this population to engage in exercise.

Recommendations for Future Research

The following recommendations for future research emerged from this study:

1. Expand the number of academic institutions involved to provide a greater potential participant pool. Increasing the participant pool can help increase the chances of completed responses. Widening the population radius can also improve the quality of responses and provide a more diverse demographic.

2. Develop exercise programs for students with schizophrenia and test the effectiveness of these programs.

3. Longitudinal studies combined with exercise interventions to observe what long term motivators are present in the lifetime of a person with schizophrenia would be recommended.

4. Case study or narrative qualitative research in order to determine better real life motivators for people with schizophrenia would be useful. While some barriers have been identified in this population, there seems to be a lack of knowledge on how to implement a program to address these barriers.

REFERENCES CITED

Albert, A. B. ., Jacobs, H. E. ., & Siperstein, G. N. (2016). Sticks, stones, and stigma: student bystander behavior in response to hearing the word "Retard." *Intellectual & Developmental Disabilities*, *54*(6), 391–401. doi:10.1352/1934-9556-54.6.391

Bravo, A. J, Pearson, M. R. ., Pilatti, A., Read, J. P. ., Mezquita, L., Ibáñez, M. I. 5,., & Ortet, (2018). Impulsivity-related traits, college alcohol beliefs, and alcohol outcomes: Examination of a prospective multiple mediation model among college students in Spain, Argentina, and USA. *Addictive Behaviors*, *81*, 125–133. doi:10.1016/j.addbeh.2018.02.009

Bruffaerts, R., Mortier, P., Kiekens, G., Auerbach, R. P., Cuijpers, P., Demyttenaere, K., & Kessler, R. C. (2018). Mental health problems in college freshmen: Prevalence and academic functioning. *Journal Of Affective Disorders*, *22, 5*97-103. doi:10.1016/j.jad.2017.07.044

Campus Mental Health. (2017) *American Psychological Association.* Retrieved from http://www.apa.org/advocacy/higher-education/mental-health/index.aspx

Creswell, J. W. (2012). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage Publications.

Deighton, S., & Addington, J. (2014). Exercise practices of young people at their first episode of psychosis. *Schizophrenia Research*, *152*(1), 311–312. https://doi /10.1016/j.schres.2013.10.045

Exercise is Medicine. (2012). Fact Sheet. Retrieved from http://exerciseismedicine.org/assets/page_documents/EIMFactSheet_2014.pdf

Farahani, L. A., Parvizy, S., Mohammadi, E., Asadi-Lari, M., Kazemnejad, A., Hasanpoor-Azgahdy, S. B., & Taghizadeh, Z. (2017). The psychometric properties of exercise benefits/barriers scale among women. *Electronic Physician*, *9*(7), 4780-4785. doi:10.19082/4780

Firth, J., Carney, R., Jerome, L., Elliott, R., French, P., & Yung, A. R. (2016). The effects and determinants of exercise participation in first-episode psychosis: a qualitative study. *BMC Psychiatry*, *16*1-9. doi:10.1186/s12888-016-0751-7

Firth, J., Cotter, J., Carney, R., & Yung, A. R. (2017). The pro-cognitive mechanisms of physical exercise in people with schizophrenia. *British Journal Of Pharmacology*, *174*(19), 31613172. doi:10.1111/bph.13772

Fogarty, M., & Happell, B. (2005). Exploring the benefits of an exercise program for people with schizophrenia: a qualitative study. *Issues In Mental Health Nursing*, *26*(3), 341-351.

Gretchen-Doorly, D., Kite, R. E., Subotnik, K. L., Detore, N. R., Ventura, J., Kurtz, A. S., & Nuechterlein, K. H. (2012). Cardiorespiratory endurance, muscular flexibility and strength in first-episode schizophrenia patients: use of a standardized fitness assessment. *Early Intervention in Psychiatry*, *6*(2), 185–190. https://doi- 10.1111/j.1751-7893.2011.00313.x

Holmen TL., Egeland J., Andersen E., Bigseth TT., Engh JA. (2018). The association between cardio-respiratory fitness and cognition in schizophrenia. Schizophrenia Research, 193,418–422. doi:10.1016/j.schres.2017.07.015

Kavanagh, M., & Banyard, P. (2013). The Effect of an Alternative Term for Schizophrenia in Reducing Discriminatory Attitudes of the English-Speaking Lay

Public. *International Journal of Mental Health*, *42*(4), 3–33. doi:10.2753/IMH00207411420401

Koike, S., Yamaguchi, S., Ojio, Y., Shimada, T., Watanabe, K., & Ando, S. (2015). Long-term effect of a name change for schizophrenia on reducing stigma. *Social Psychiatry & Psychiatric Epidemiology*, *50*(10), 1519–1526. doi:10.1007/s00127 015-1064-8

Martin, D. (2017). Higher education institutions' treatment of students deemed a "direct threat" to themselves and the ADA. *Northwestern Journal Of Law & Social Policy*, *12*(3), 111 129.

Noyman-Veksler, G., Weinberg, D., Fennig, S., Davidson, L., & Shahar, G., (2013). Perceived stigma exposure in schizophrenia: The key role of self-concept Clarity. *Self & Identity*, *12*(6), 663–674. doi10.1080/15298868.2012.732265.

Person-centered Language. (n.d.). Retrieved from https://www.ahrc.org/newsroom/person-centered-language/

Pescatello, L. (2014). *ACSM's guidelines for exercise testing and prescription*. Philadelphia, PA: Wolters Kluwer/Lippincott Williams & Wilkins.

Pescosolido, B. A., Medina, T. R., Martin, J. K., & Long, J. S. (2013). The "backbone" of stigma: Identifying the global core of public prejudice associated with mental illness. *American Journal Of Public Health*, *103*(5), 853–860. doi:10.2105/AJPH.2012.301147

Roberts, S. H., & Bailey, J. E. (2011). Incentives and barriers to lifestyle interventions for people with severe mental illness: A narrative synthesis of quantitative, qualitative and mixed methods studies. *Journal Of Advanced Nursing*, *67*(4), 690708. doi:10.1111/j.1365 2648.2010.05546.x

Rummel-Kluge, C., Komossa, K., Schwarz, S., Hunger, H., Schmid, F., Lobos, C. A., & Leucht, S. (2010). Head-to-head comparisons of metabolic side effects of second generation antipsychotics in the treatment of schizophrenia: A systematic review and meta-analysis. *Schizophrenia Research*, *123*(2/3), 225-233. doi:10.1016/j.schres.2010.07.012

Schizophrenia. (2016). *National Institute Of Mental Health.* Retrieved from https://www.nimh.nih.gov/health/topics/schizophrenia/index.shtml

Schizophrenia Spectrum and Other Psychotic Disorders. (2013). DSM-5 Clinical Cases. doi:10.1176/appi.books.9781585624836.jb02

Taylor PJ, Awenat Y, Gooding P, Johnson J, Pratt D, Wood A, & Tarrier N. (2010). The subjective experience of participation in schizophrenia research: a practical and ethical issue. *Journal of Nervous & Mental Disease*, *198*(5), 343–348. https://doi org.libproxy.temple.edu/10.1097/NMD.0b013e3181da8545

Tetlie T., Heimsnes M. & Almvik R. (2009) Using exercise to treat patients with severe mental illness: how and why? *Journal of Psychosocial Nursing & Mental Health Services* **4**7, 32–40.

Vancampfort, D., Knapen, J., Probst, M., Scheewe, T., Remans, S., & De Hert, M. (2012). A systematic review of correlates of physical activity in patients with schizophrenia. *Acta Psychiatrica Scandinavica*, *125*(5), 352-362. doi:10.1111/j.1600-0447.2011.01814.x

Vancampfort, D., Van Damme, T., Probst, M., Firth, J., Stubbs, B., Basangwa, D., & Mugisha, J. (2017). Physical activity is associated with the physical, psychological, social and environmental quality of life in people with mental

health problems in a low resource setting. *Psychiatry Research*, *258*250-254. doi:10.1016/j.psychres.2017.08.041

Wattles, M. (2001). *Professionalization of Exercise Physiology*. doi:10.4135/9781412961165.n179

Zschucke, E., Gaudlitz, K., & Ströhle, A. (2013). Exercise and physical activity in mental disorders: clinical and experimental evidence. *Journal Of Preventive Medicine And Public Health Yebang Ŭihakhoe Chi*, *46 Suppl 1*S12-S21. doi:10.3961/jpmph.2013.46.S.S12

APPENDIX A

ONLINE CONSENT FORM

Consent to Participate in a Research Study

Motivation and Adherence to Exercise in College Students with Schizophrenia

Primary Researchers: Dr. Michael Sachs (Professor of Kinesiology) & Haley Knotts (Department of Kinesiology, Temple University)

Why am I being invited to take part in this research?

You are being invited to take part in a research study regarding physical activity participation within college students diagnosed with schizophrenia. You can participate if you are considering starting physical activity, or do not currently participate in any physical activity. Dr. Michael Sachs is the person in charge of this study, and the primary student researcher is Haley Knotts, both of which are from Temple University. The primary student researcher will gather and analyze the information from the study. Other people on the research team may assist at different times during the study as well.

By completing this study, we hope to gain knowledge about the psychosocial components and environmental factors influencing physical activity participation among college students diagnosed with schizophrenia. The full period of the study will be about 2 months, including a survey and an optional in-person interview.

What should I know about this research?

Initially, you will be asked to complete an online survey regarding your contact information/demographics, physical activity level, and select school information. You will also be asked to fill out the Exercise Benefits/Barriers Scale (EBBS). At the end of the survey, you will be asked if you would like to be interviewed. Compensation for completing the online survey will be a $10 gift card to the Philadelphia Pretzel Factory. If you opted for taking part in an in-person interview with the student researcher, you will be contacted via email to arrange the interview at a time and location of your choosing. To participate in the interview, you will need to provide your name and contact information to the research team. This information will be used by the research team to contact you and request your availability for the interview. Compensation for completing the in-person interview will be an additional $10 gift card to the Philadelphia Pretzel Factory. Please note that not all individuals who indicate an interest in being interviewed will necessarily be selected for an interview. If enough students indicate an interest in being interviewed, selection of interviewees will be determined based on demographic factors.

You should only participate in the study if you truly want to volunteer. There will be no penalty and you will not lose any benefits or rights that you would normally have if you choose not to volunteer. No one on the research team will behave any differently toward you if you choose not to participate in the study. You can stop at any time during the study and still keep the benefits and rights that you had before volunteering. There are no costs associated with taking part in this study.

Your information will be combined with information from other people taking part in the study. When the results are shared with other researchers, we will only write about the combined

information. You will not be identified in any published or presented materials. That means that only the student researcher in charge of the study, Haley Knotts, will know that the information that you provided came from you. If you decide to take part in the study, you have the right to decide at any time that you no longer want to continue. Again, if you do not want to participate, you are under no obligation to do so.

To whom can I talk about this research?

If you have questions about the study, you can contact the student researcher, Haley Knotts (haley.knotts@temple.edu), or Dr. Michael Sachs (msachs@temple.edu). If you have any questions about your rights as a research participant, contact the Temple Institutional Review Board at 215-707-3390 or irb@temple.edu. I am required by federal law to provide you with a copy of this informed consent form. You may request a copy of the project summary or final report. I understand that my participation in this research study is entirely voluntary. I may refuse to participate without penalty. I may also stop participating at any time without penalty. I have received a copy of this consent form to take home with me.

___ I consent, begin the study
___ I do not consent, I do not wish to participate

APPENDIX B

DEMOGRAPHICS QUESTIONNAIRE

Demographics Questionnaire

1. What is your age? ___ *years*
2. What sex do you most closely identify with?

   ___ Male ___ Female

   _____ Other (Please specify)
3. What is your ethnicity? (Can select more than one)

   ___ White ___ Native American

   ___ Hispanic/Latino ___ Asian

   ___ Black or African American

   ___ Native Hawaiian or Pacific Islander

   _____ Other (Please specify)
4. What is your current school year at Temple University?

   ___ Undergraduate Freshman ___ Undergraduate Senior

   ___ Undergraduate Sophomore ___ Graduate Student, Master's

   ___ Undergraduate Junior ___ Graduate Student, Doctorate
5. How many years have you studied at Temple? _____ *years*
6. What is your current cumulative grade point average (GPA) on a 4.0 scale?

   _____
7. At what age were you diagnosed with schizophrenia? _____ *years*
8. What medications are you currently taking, if any?

   _____

   _____

   _____

   _____
9. What types of exercise have you done in the past? (Biking, hiking, sports, group fitness, etc.)

   _____

   _____

   _____

   _____

10. How many minutes per week do you usually exercise? _____ *minutes per week*
11. What types of exercise do you currently engage in? (Biking, hiking, sports, group fitness, etc.) What kind of intensity are the exercises? (Moderate physical activity is when it is hard to breathe during exercise, but you can easily talk to someone. Vigorous physical activity is when it is hard to speak during the exercise, but you cannot talk to someone)

    _____

    _____

    _____

    _____

12. Would you be interested in participating in an in-person interview session with a graduate student researcher? **Those who participate will be given a $10 gift card to the Philadelphia Pretzel factory.**

    ___ Yes ___ No

13. If you selected yes to the last questions, please provide your name and email:

    _____

    _____

    _____

Thank you for taking time to complete this questionnaire

APPENDIX C

EBBS ADULT VERSION

EXERCISE BENEFITS/BARRIERS SCALE

DIRECTIONS: Below are statements that relate to ideas about exercise. Please indicate the degree to which you agree or disagree with the statements by circling SA for strongly agree, A for agree, D for disagree, or SD for strongly disagree.

		Strongly Agree	Agree	Disagree	Strongly Disagree
1.	I enjoy exercise.	SA	A	D	SD
2.	Exercise decreases feelings of stress and tension for me.	SA	A	D	SD
3.	Exercise improves my mental health.	SA	A	D	SD
4.	Exercising takes too much of my time.	SA	A	D	SD
5.	I will prevent heart attacks by exercising.	SA	A	D	SD
6.	Exercise tires me.	SA	A	D	SD
7.	Exercise increases my muscle strength.	SA	A	D	SD
8.	Exercise gives me a sense of personal accomplishment.	SA	A	D	SD
9.	Places for me to exercise are too far away.	SA	A	D	SD
10.	Exercising makes me feel relaxed.	SA	A	D	SD
11.	Exercising lets me have contact with friends and persons I enjoy.	SA	A	D	SD
12.	I am too embarrassed to exercise.	SA	A	D	SD
13.	Exercising will keep me from having high blood pressure.	SA	A	D	SD
14.	It costs too much to exercise.	SA	A	D	SD
15.	Exercising increases my level of physical fitness.	SA	A	D	SD
16.	Exercise facilities do not have convenient schedules for me.	SA	A	D	SD
17.	My muscle tone is improved with exercise.	SA	A	D	SD
18.	Exercising improves functioning of my cardiovascular system.	SA	A	D	SD
19.	I am fatigued by exercise.	SA	A	D	SD
20.	I have improved feelings of well being from exercise.	SA	A	D	SD
21.	My spouse (or significant other) does not encourage exercising.	SA	A	D	SD

(Continued on reverse side)

		Strongly Agree	Agree	Disagree	Strongly Disagree
22.	Exercise increases my stamina.	SA	A	D	SD
23.	Exercise improves my flexibility.	SA	A	D	SD
24.	Exercise takes too much time from family relationships.	SA	A	D	SD
25.	My disposition is improved with exercise.	SA	A	D	SD
26.	Exercising helps me sleep better at night.	SA	A	D	SD
27.	I will live longer if I exercise.	SA	A	D	SD
28.	I think people in exercise clothes look funny.	SA	A	D	SD
29.	Exercise helps me decrease fatigue.	SA	A	D	SD
30.	Exercising is a good way for me to meet new people.	SA	A	D	SD
31.	My physical endurance is improved by exercising.	SA	A	D	SD
32.	Exercising improves my self-concept.	SA	A	D	SD
33.	My family members do not encourage me to exercise.	SA	A	D	SD
34.	Exercising increases my mental alertness.	SA	A	D	SD
35.	Exercise allows me to carry out normal activities without becoming tired.	SA	A	D	SD
36.	Exercise improves the quality of my work.	SA	A	D	SD
37.	Exercise takes too much time from my family responsibilities.	SA	A	D	SD
38.	Exercise is good entertainment for me.	SA	A	D	SD
39.	Exercising increases my acceptance by others.	SA	A	D	SD
40.	Exercise is hard work for me.	SA	A	D	SD
41.	Exercise improves overall body functioning for me.	SA	A	D	SD
42.	There are too few places for me to exercise.	SA	A	D	SD
43.	Exercise improves the way my body looks.	SA	A	D	SD

EXERCISE BENEFITS/BARRIERS SCALE

Scoring Information

The instrument may be scored and used in its entirety or as two separate scales. The instrument has a four-response, forced-choice Likert-type format with responses ranging from 4 (strongly agree) to 1 (strongly disagree). Barrier Scale items are reverse-scored. Items on the Barrier Scale are numbers 4, 6, 9, 12, 14, 16, 19, 21, 24, 28, 33, 37, 40 and 42.

Missing data may be handled in one of two ways. If more than five percent of the items are unanswered, it is recommended that the response be discarded. If the missing item response rate is less than five percent, median substitution prevents falsely low scores.

Scores on the total instrument can range from 43 to 172. The higher the score, the more positively the individual perceives exercise. When the Benefits Scale is used alone, the score range is between 29 and 116. When the Barriers Scale is used alone, scores range between 14 and 56. If used alone, the Barriers Scale does not need to be reverse-scored. In this instance, the higher the score on the Barriers Scale, the greater the perception of barriers to exercise.

APPENDIX D

SEMI STRUCTURED INTERVIEW CONSENT FORM

Consent to Participate in a Research Study

Motivation and Adherence to Exercise in College Students with Schizophrenia

Primary Researchers: Dr. Michael Sachs (Professor of Kinesiology) & Haley Knotts (Department of Kinesiology, Temple University)

Why am I being invited to take part in this research?

You are being invited to take part in a research study regarding physical activity participation within college students diagnosed with schizophrenia. You can participate if you are considering starting physical activity, or do not currently participate in any physical activity. Dr. Michael Sachs is the person in charge of this study, and the primary student researcher is Haley Knotts, both of which are from Temple University. The primary student researcher will gather and analyze the information from the study. Other people on the research team may assist at different times during the study as well.

By completing this study, we hope to gain knowledge about the psychosocial components and environmental factors influencing physical activity participation among college students diagnosed with schizophrenia. The full period of the study will be about one month.

What should I know about this research?

You will be participating in one in-person interview with questions that the student researcher has prepared herself. The questions will be investigating your exercise engagement and adherence to exercise as it relates to your schizophrenia diagnosis. Compensation for completing the in-person interview will be a $10 gift card to the Philadelphia Pretzel Factory.

To participate in the study, you will need to provide your name and contact information to the research team. This information will be used by the research team to contact you and request your availability for the interview. You will be asked to provide this information in the online survey.

You should only participate in the study if you truly want to volunteer. There will be no penalty and you will not lose any benefits or rights that you would normally have if you choose not to volunteer. No one on the research team will behave any differently toward you if you choose not to participate in the study. You can stop at any time during the study and still keep the benefits and rights that you had before volunteering. There are no costs associated with taking part in this study.

Your information will be combined with information from other people taking part in the study. When the results are shared with other researchers, we will only write about the combined information. You will not be identified in any published or presented materials. That means that only the student researcher in charge of the study, Haley Knotts, will know that the information that you provided came from you. If you decide to take part in the study, you have the right to decide at any time that you no longer want to continue. Again, if you do not want to participate, you are under no obligation to do so.

To whom can I talk about this research?

If you have questions about the study, you can contact the student researcher, Haley Knotts (haley.knotts@temple.edu), or Dr. Michael Sachs (msachs@temple.edu). If you have any questions about your rights as a research participant, contact the Temple Institutional Review Board at 215-707-3390 or irb@temple.edu. I am required by federal law to provide you with a copy of this informed consent form. You may request a copy of the project summary or final report. I understand that my participation in this research study is entirely voluntary. I may refuse to participate without penalty. I may also stop participating at any time without penalty. I have received a copy of this consent form to take home with me.

Printed Name of Participant	Date
Signature of Participant	
Signature of Principal Researcher	Date
Signature of Witness	Date

APPENDIX E

SEMI STRUCTURED INTERVIEW QUESTIONS

Interview Questions

1. Have you had any experience with exercise?
   If yes, please tell me about it …
   If yes, how has having schizophrenia affected your exercise behaviors?
2. At what age did you experience FEP?
3. When you feel stressed, what do you do to help alleviate your stress?
4. Do you experience any complications with your medication?
   a. If yes, what are they?
5. What does your daily routine consist of?
6. What are some things you can think of to get more physical activity into your daily routine?
7. If you could build your own exercise program, what would it look like?
8. What other physical activities have you engaged in that you have found enjoyable?
9. How important is it to you to stay healthy?
10. On a scale of 1 to 5, with 1 being not at all likely and 5 being extremely likely, how likely are you to exercise at least once in the next week?
    a. Why not a lower number?
    b. Why not a higher number?
    c. What factors would help you increase your response number?
11. On a scale of 1 to 5, with 1 being not at all confident and 5 being extremely confident, how confident are you that you could stick with an exercise program if one is created for you by an exercise specialist?
    a. Why not a lower number?
    b. Why not a higher number?
    c. What factors would help you increase your response number?

APPENDIX F

EMAIL TO PARTICIPANTS

Good morning everyone!

My name is Haley Knotts, and I am a graduate student at Temple University in the Kinesiology Department conducting research on motivation and adherence to exercise in college students with schizophrenia.

I am asking for your help in my research study. Temple's Disability Resources and Services department has reviewed my project and agreed to send you this e-mail on my behalf. Participation in this research involves taking an online survey about your attitudes and motivations toward physical activity. After completing the survey, you have the option of participating in an in-person interview. If you decide to participate in the on-line survey, you can receive a $10 gift card to the Philadelphia Pretzel Factory. Additionally, if you are interested in participating in an interview and are selected for the interview, you will receive an additional $10 gift card to the Philadelphia Pretzel factory.

If you would like to participate in the research, please click on the following link and you can get started with the survey:

https://chpswtemple.co1.qualtrics.com/jfe/form/SV_aWOuS4GShljHf7v

If you have any questions, please contact me at haley.knotts@gmail.com.

Thanks for your consideration!