EFFECTS OF A PEER-ASSISTED PHYSICAL ACTIVITY PROGRAM ON DEPRESSION AND ANXIETY IN COLLEGE STUDENTS

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ABSTRACT

EFFECTS OF A PEER-ASSISTED PHYSICAL ACTIVITY PROGRAM ON DEPRESSION AND ANXIETY IN COLLEGE STUDENTS

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The purpose of this qualitative study was to examine the effects of a peer-assisted, self-selected physical activity program on depression and anxiety in students at a four-year university, and to explore the various possible mechanisms by which depression and anxiety were affected. These mechanisms included physical activity, self-efficacy, relatedness, competence, and autonomy. A secondary purpose was to examine the benefits of participation for the physical activity buddies who provided the peer-support. In-depth interviews were conducted with three program participants with depression and/or anxiety, six physical activity buddies who supported the participants, and three referring professional healthcare providers. A qualitative data analysis was completed using the professional analysis software Atlas.ti to find and weigh the importance of both deductive and inductive themes that emerged from the transcripts. Results showed that participation in a peer-assisted physical activity program provided significant benefits for the participants with depression and/or anxiety, as well as the physical activity buddies who supported

them, and the overburdened campus healthcare centers. Participants with depression and/or anxiety experienced a reduction in those symptoms while also gaining an increase in self-efficacy and competence. The mechanism found to be primarily responsible for the changes was the combination of physical activity and relatedness. Other mechanisms of benefit included self-efficacy and competence, routine, nature, and other lifestyle changes. The results from this study illuminate a cost-effective way to address rising depression and anxiety rates in college students.

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INTRODUCTION

Depression is a leading cause of disability, affecting an estimated 300 million people worldwide (WHO, 2018). Depression is a serious mental disorder that is more than passing feelings of sadness or disappointment; it often includes feelings of hopelessness, worthlessness, and loss of interest and enjoyment (NIMH, 2016b) and it affects thoughts, mood states, physiological sensations, energy levels, and sleep patterns (Lox, Martin Ginis, & Petruzzello, 2014; WHO, 2018). The symptoms of depression can range in intensity with varying effects and consequences including impaired functioning in relationships, early termination of education, unemployment or underemployment, substantially lower income, and significantly shortened lifespan (Kessler, 2012). Depression rates continue to rise with an estimated 15.7 million adults in the United States effected, totaling 6.7 percent of the population (NIMH, 2016b). The economic burden of depression shouldered on the public is estimated to cost $26.1 billion annually (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015) due to direct medical, psychological, and pharmacological costs, and depression-related suicide mortality costs (Greenberg et al., 2015; Greenberg et al., 2003; Greenberg, Stiglin, Finkelstein, & Berndt, 1993).

Another factor influencing the devastation and rising cost of depression is the high likelihood of comorbidity with other medical and psychological conditions (Greenberg et al., 2003). Depression is a greater predictor of overall poor health than other chronic conditions such as angina, asthma, arthritis, and diabetes (Moussavi et al., 2007) and there is a 72 percent prevalence of depression co-occurring with other chronic health disorders, including asthma, arthritis, cardiovascular disease, cancer, and diabetes (Kessler et al., 2003; Kessler, 2012). Compared to non-depressed populations, depressed individuals have significantly decreased lifespans, up to 14 to 32 years earlier than the general population, which can be due to poor health, as well as an increased rate of suicide (Kessler, 2012; Kessler et al., 2003: NIMH, 2011). In addition to high co-occurrence of depression and chronic physical health conditions, there is also a high comorbidity of depression with other mental health disorders, including mood, impulse control, substance use, and anxiety disorders (Kessler, Chiu, Demler, & Walters, 2005). The likelihood of depression and anxiety occurring together can be as high as 40 percent (Kessler et al., 2005a).

Anxiety is the most prevalent mental health problem in the U.S., affecting 18.1 percent of the population (Lox et al., 2014; NIMH, 2016a; Ravindran & Stein, 2010). Similar to the continuum of severity in depression symptoms, anxiety can range in intensity from occasional feelings of anxiousness to clinical long-term debilitating

anxiety. Clinical anxiety is persistent, overwhelming, and perceived as uncontrollable; it affects mood, thought, and behavior, causes physiological changes, and often includes excessive or irrational feelings of dread or unmanageable fear, which can have a negative effect on daily life and functioning (NIMH, 2016b).

In addition to the challenges and consequences an individual with an anxiety disorder endures, clinical anxiety also adds to the rising burden of disability worldwide (Lox et al., 2014). The individual burden of clinical anxiety includes impairments in physical, emotional, social, and workplace functioning, as well as a significant reduction in overall quality of life (Hoffman, Dukes, & Wittchen, 2008). The economic burden of clinical anxiety, due to direct costs associated with management and treatment as well as losses in productivity at work, has been estimated at more than $42 billion annually, accounting for almost one-third of the U.S. total mental health cost (Greenberg et al., 1999). Individuals suffering from anxiety are three to five times more likely to go to a doctor and six times more likely to be hospitalized than people without anxiety (NIMH, 2016a). Clinical anxiety is typically an early onset disorder with a median age of 11 years-old for the first symptoms, half of all lifetime cases developing by age 14, and three quarters of cases occurring by age 24 (Kessler et al., 2005).

Young adults entering college are at increased risk for serious psychological distress as they undergo several developmental changes and face new challenges, such as living on their own, managing finances, developing individual identity, and navigating relationship issues (Compas, Wagner, Slavin, & Vannatta, 1986; Mowbray et al., 2006; Shally-Jensen, 2013). The Center for Collegiate Mental Health (2014) collected data from 263 college and university health clinics across the U.S. and found that 48.7 percent of students attended counseling for mental health concerns, 32.9 percent used medication for mental health concerns, 30.3 percent seriously considered suicide, 11.2 percent considered seriously hurting another person, and 3.3 percent intentionally caused serious injury to another person. Mental health disorders may cause a decrease in academic performance, an increase in early termination of college, as well as a negative impact on lifetime employment and financial success (ACHA, 2016; Kessler, 2012).

Among the most prevalent mental health concerns for college students are anxiety and depression. More than 50 percent of college students experienced "overwhelming anxiety" and 31 percent reported being "so depressed that it was difficult to function" (ACHA, 2014, p. 14). In 2013, over 20 percent of students were diagnosed or treated by a professional for anxiety and 11 percent of students were diagnosed or treated for depression (ACHA, 2014).

High rates of anxiety and depression on college campuses illuminate the necessity for mental health services and prevention programs to be available to students (Shally-Jensen, 2013), and as these rates continue to rise, campus mental health centers are often overburdened and not able to provide sufficient services for the students in need of care (CCMH, 2014; Kirsch et al., 2014; Mowbray et al., 2006; Shally-Jensen, 2013). College health centers often set limits on individual counseling sessions, such as six sessions per student (Kirsch et al., 2014; Shally-Jensen, 2013), and refer students to community resources to help alleviate some of the burden (Mowbray et al., 2006; Shally-Jensen, 2013).

Traditional treatments for depression and anxiety, such as cognitive-behavioral therapy and medication, can be effective for managing symptoms (Ravindran & Stein, 2010; NIMH 2016a), and often a combination of the two are used in treatment (ADAA, 2014). However, medication has controversial effectiveness, often cited as being mildly effective when compared to placebo effects (NIMH, 2011). Also, the side effects of medication are common and can include insomnia, weight gain, stomach upset, headache, sexual dysfunction, blood pressure increase, constipation, urinary retention, dry mouth, blurry vision, and medication dependence (ADAA, 2016; WHO, 2018). The World Health Organization (2018) stated that although medication may be effective for moderate to severe depression, it is not

recommended as the first line of treatment for mild depression. Even with the controversial effectiveness and risk of side effects, 11 percent of the United States population over 12 years old reported taking antidepressants and, in 2011, approximately 254 million antidepressant prescriptions were written, resulting in a cost of almost $10 billion (NIMH, 2011). However, the majority of people suffering from mental disorders remain untreated or poorly treated, and interventions to increase treatment options are needed (Kessler et al., 2005b; Wang, Lane, Olfson, Pincus, Wells, & Kessler, 2005). As depression and anxiety rates continue to rise, so does the exploration of complementary and alternative treatments (Ernst, 2000; Louie, 2014).

One alternative treatment with increasing support and efficacy for reducing both depression and anxiety is exercise, and research has shown that exercise can be an effective adjunct as well as an alternative to traditional treatment, such as medication (Cai, 2000; Craft, 2005; Nagoshi & Ringenbach, 2011; Weinberg & Gould, 2015). Exercise has comparable effectiveness of antidepressant and anxiolytic medications (Daley, 2008; Dinas, Koutedakis, & Flourish, 2011) and, on average, people who exercise regularly are less anxious and depressed than non-exercisers (De Moor, Beem, Stubbe, Boomsma, & Geus, 2006). Specifically, exercise is a relatively safe and beneficial treatment for reducing depression in individuals with mild to

moderate symptoms (Daley, 2008; WHO, 2018) and, compared to traditional treatment, exercise does not carry the same risk of side effects, is affordable, does not require doctor's visits, and can be utilized within the chosen time frame of the participant (Daley, 2008).

Various types and intensities of exercise (from low to moderate to high) have shown to be effective in reducing depression and anxiety, including both aerobic and anaerobic exercise, such as walking or cardio exercise machines (Stanton & Raeburn, 2014). The specific recommendations for using exercise to reduce depression include the use of both aerobic and anaerobic exercise three to five times a week for 30-60 minutes per session with a maximal heart rate of 50 to 85% (Weinberg & Gould, 2015). The recommendations for using exercise to reduce anxiety also include both aerobic and anaerobic; however, the maximal heart rate recommendation is lower for anxiety with a range between 30 to 50% (Weinberg & Gould, 2015). Exercise has been shown to be effective in an immediate reduction of anxiety following an acute bout of exercise, as well as a reduction in anxiety over time due to a chronic condition of exercise (Ensari, Greenlee, Motl, & Petruzzello, 2015; Broman-Fulks, Berman, Rabian, & Webster, 2004; Merom et al., 2008; Ströhle, 2009). Additionally, it is recommended that an intervention length of 10 weeks is beneficial in using exercise for depression and anxiety (Weinberg & Gould, 2015).

Although exercise has been shown to be effective in the reduction of depression and anxiety, as well as improving overall health, exercise adherence often remains a barrier. Fifty percent of people who begin an exercise program drop out within the first six months (Weinberg & Gould, 2015). In addition, populations struggling with anxiety and depression may be at increased risk for failing to adhere to exercise programs (Martin, Williams, Haskard, & DiMatteo, 2005; Sabourin, Hilchey, Lefaivre, Watt, & Stewart, 2011). Some mechanisms that have been shown to be beneficial for exercise adherence include enhancing intrinsic motivation, self-efficacy, competence, autonomy, and relatedness (Edmunds, Ntoumanis & Duda, 2007).

The Self Determination Theory (SDT) is a framework for understanding basic human needs, desires, and ambition that affirms that people are intrinsically motivated by competence, autonomy, and relatedness (Deci & Ryan, 2008). These concepts together assist in the development of high quality motivation and can lead to long-term persistence in the attainment of goals in several domains, including health and education (Deci & Ryan, 2008). SDT has been extremely useful in understanding motivation in a variety of settings and applications, including how intrinsic motivation relates to long-term exercise adherence (Deci & Ryan, 2008; Tiexeira, Carraca, Markland, Silva, & Ryan, 2012).

Self-Efficacy Theory also contributes to the understanding of motivation by addressing the concept that people have a strong desire to act when they believe that their actions will be effective and that they are capable of success (Bandura, 1997). Enhancing self-efficacy and motivation in exercise situations can be a valuable way to provide support for exercise adherence (Fletcher & Banasik, 2001). There are several principal concepts or sources of self-efficacy, which include performance accomplishments, vicarious experiences, verbal persuasion, imaginal experiences, physiological states, and emotional states (Weinberg & Gould, 2015).

Another aspect to understanding and enhancing motivation and adherence to physical activity is the use of a peer-assistant, a knowledgeable guide, ally, and role model (Mead, Hilton, & Curtis, 2001). Peer relationships are related to positive health outcomes in general, and the peer-assistance model for increasing physical activity has been shown to be beneficial (Smith, 2003), especially in young adults (Fuhr et al., 2014; Temple & Stanish, 2011). Similar to the relatedness aspect of SDT, peer-assistance fosters a sense of connection and an ability to identify and connect with another human being. People often begin exercise programs for opportunities to socialize and be with others, and social support helps to foster high quality intrinsic motivation (Weinberg & Gould, 2015). Social engagement and connection has been shown to be directly related to increasing intrinsic motivation, exercise participation,

and adherence (Teixeira et al., 2012). In addition to the benefits for the participant in a peer-assistance relationship, research has shown that the peer-assistant also receives benefits (Bracke, Christiaens, & Verhaeghe, 2008; Solomon & Anthony, 2004) by helping to develop social responsibility and the ability to support another in healing (Mead et al., 2001).

With rising rates of depression and anxiety in college students, alternative treatment options need to be researched and developed to alleviate the overburdened resources and impacted counseling services that are currently available. There is a growing need for effective, affordable and easily implementable college programs to provide support to the vulnerable populations of students experiencing depression and anxiety. Therefore, the purpose of this study was to examine the effects of a peer-assisted, self-selected physical activity program on depression and anxiety of program participants at a four-year university, and to explore the various possible mechanisms by which depression and anxiety were affected. A secondary purpose was to examine the benefits of participation for the physical activity buddies. It was hypothesized that program participants in the peer-supported, self-selected physical activity program would experience a decrease in depression and anxiety from the beginning to the end of the program. Additionally, it was hypothesized that the program would be beneficial for the physical activity buddies providing the peer-support.

METHODS

Participants

There were 12 total participants in this study, including program participants (PPs), physical activity buddies (PABs), and heath care providers (HCPs). PPs were three students who attended a four-year university in the Spring Semester of 2017. PPs were eligible to participate in the study if they met the following criteria: 1) were referred to a peer-assisted, self-selected physical activity program from a university health care provider for anxiety and/or depression; 2) had no injuries limiting participation in physical activity at least two hours a week; and 3) were at least 18 years of age. The PABs who supported the PPs were required to complete trainings and readings and pass a competency exam before being matched with PPs. Three referring professional campus HCPs who referred PPs also were involved in this study.

Interviews

The qualitative study design included semi-structured interviews, which allowed for probing follow-up questions that were conducted to gather data to analyze and uncover themes on the effects of a self-selected peer-assisted physical

activity program on depression and anxiety of college students. The interview questions are listed in Appendix A. Questions for the interviews were designed by the research team with the intention to uncover and illuminate the perceptions of the participants in the study. In general, the questions were structured to be broad, open-ended, and conversational, which has been shown to be most appropriate for seeking "to understand the context of a health problem" (Lewis, 2015, p. 474). This type of questioning was intentional to gain an overall sense of the PPs' experiences of how their depression, anxiety, and self-efficacy for exercise may have changed during their involvement, to understand the PABs' experiences of participating in the program, and to discover the referring HCPs' perception of the overall effectiveness of the intervention. The questions were designed with a desire to understand the various mechanisms that helped alleviate depression and anxiety in college students. These mechanisms included self-efficacy and the three aspects of the Self-Determination Theory: competence, autonomy, and relatedness. In the Fall 2016 Semester, the research team conducted a pilot study to test and refine interview questions for the current study.

Procedure

The Program Coordinator met with all PPs and PABs individually to determine the best matches. Once matched, the PP and PAB pairs engaged in self-selected one-hour physical activity sessions twice a week for a 10- to 12-week intervention. Research has shown support for benefits of exercising three or more times per week (Stanton & Raeburn, 2014); however, students with depression and/or anxiety and full schedules may be overwhelmed by meeting more than twice a week.

At the end of the program, PPs, PABs, and HCPs were asked to volunteer to participate in the interviews. Each interview was conducted and recorded by the principal investigator in a private room in the university library or health care center and then transcribed verbatim. Participants were informed that all questions were to be answered on a voluntary basis and that they could decline to respond to any questions they did not wish to answer. They were also instructed to not identify people in the program by name. The interviews took approximately 20 to 30 minutes each.

Data Analysis

After the interviews were completed and transcribed, the data were analyzed

using the professional research software Atlas.ti to help uncover and systematically analyze complex phenomena hidden in the unstructured data of the transcripts. This program provides tools to help locate relevant topics and themes, weigh their importance, and provide a visualization of the complex relationships between the themes. A review of Atlas.ti found that the program can "enhance credibility building by making the research process more transparent and replicable" (Hwang, 2008, p. 525). Along with Altas.ti, the process of constant comparison was used. Constant comparison is a coherent and systematic inclusive approach of comparing each item and adding categories and themes (Pope, Ziebland, & Mays, 2000). Also, both deductive and inductive data analysis were used as some of the themes were previously expected to come out in the analysis (deductive analysis) and several themes were inductively obtained as they gradually emerged from the data (Pope, Ziebland, & Mays, 2000).

FINDINGS

The present qualitative research study sought to examine the effects of a peer-assisted, self-selected physical activity program on depression and anxiety of PPs at a four-year university, and to explore the various possible mechanisms by which depression and anxiety were affected. A secondary purpose was to examine the benefits of participation for the PABs.

Effectiveness of the Intervention: Changes in Depression and Anxiety

The intervention was shown to be effective in reducing depression and anxiety in all interviewed PPs who reported improvement in their symptoms. In addition, PABs and HCPs noticed direct changes in the moods and behaviors of the PPs with whom they came into contact while the PPs were involved in the program. The reduction in depression and anxiety symptoms were reported on both acute (immediately after exercising) and chronic (over the duration of the program) time points.

Acute effects and benefits of the of the program were reported from participants in all three groups. One PAB reported, “afterwards we just would both be in a better mood… it was cool to see… how we were before and after, and comparing

that." Another PAB noticed that after exercise sessions his buddies often "seemed happy… and they seemed fulfilled, they seemed like they accomplished something."

In regard to chronic changes over time, participants from all three groups also reported significant differences in the PPs. One PP stated that she noticed both her anxiety and depression "went down a significant amount" and she added, "I don't feel anxiety when I go out anymore." When asked if she believed these changes were due to the program or other factors she said, "it's because of the program 'cause I haven't changed much else since I started." Another PP reported that "my depression decreased to the point where I went off the antidepressants that I was taking" and also attributed her success to the program. One PAB stated, "I noticed a big difference from the start to the end… they [the PPs] have just been more positive, saying more positive things, talking good about themselves." He continued to say that not only did he observe changes, but the PPs he worked with also voiced that they felt better on several occasions. Another PAB described the program overall as "extremely beneficial" and that one PP shared with her "how exercise has been really helping her feel more excitement about getting out of the house and doing more things" and that this lead to "the improvement of her depression symptoms." One HCP reported that she found the program was beneficial for students by saying that, "it was clear that they [the PPs] felt better physically, mentally, emotionally." Another HCP said that

she received direct feedback from a PP about "how great the program was and [that she] wanted to do it again."

Themes and Mechanisms

Relatedness/Peer-Support and Physical Activity

Relatedness, also described as peer-support, was the most common response participants from each of the three groups gave when asked about which aspect they believed to be most beneficial; however, the majority of responses cited the combination of both relatedness/peer-support and physical activity together. Five of the six PABs reported relatedness or human connection first when asked what they believed to be the most beneficial elements, using phrases such as, "the partner relationship is the most important aspect" and "social interaction" and "the most beneficial part of it was for her to have a friend that she could talk to… someone who could listen… that isn't a therapist, that isn't her mom." Another common response as to which mechanism was most beneficial was physical activity. One PP shared that she believed the physical activity itself had the biggest influence on the reduction in her depression symptoms stating, "I just do much better when I'm exercising on a regular basis. In terms of staving off depression and I just feel better physically and I feel better emotionally and its fun and it helps me have a relationship." However, she

continued that, “I wouldn’t have done the exercise if I didn’t have a [physical activity] buddy”.

Participants from each of the three groups (PPs, PABs, and HCPs) spoke at length about the combination of physical activity and relatedness. Several participants reported that it was easier to talk and form a deeper connection while being physically active; this was especially true for pairs who walked together (compared to reports of pairs who exercised in the gym, for example). Participants spoke of how the physical activity enhanced their sense of connection as well as how having someone to exercise with motivated them to be active. When asked which aspect(s) she believed to be most beneficial one PP shared, “Well, the working out, in itself. And then, also having someone to work out with, so then you’re not alone, especially like on a day that if you were feeling depressed or had anxiety, it was nice to have someone there with you to do something else other than think about the depression or anxiety. I think having the buddy was the biggest [factor].” Another PP said, “It was really nice to be able to workout and have somebody to talk to about stuff.” PABs also noticed how well exercise and human connection worked together and that it was difficult to isolate the benefits of one from the other. One PAB said, “It’s hard to know how much [benefit] is associated with the exercise and how much is associated with the time that we have had together” and that, “I think that on a psychological

somatic level, the ability to be moving, that brings up past memories, that brings up past experiences, and so the combination of walking and talking was probably the most beneficial thing."

Self-efficacy/Competence

Another theme that participants from each of the three groups indicated as beneficial in reducing depression and anxiety for PPs was self-efficacy or competence. PABs and HCPs reported they noticed PPs' self-efficacy and competence improved over the course of the program and, as those levels increased, the PPs seemed to feel better overall. One HCP said, "they [the PPs] felt accomplished. They did it. They signed up for a task. And they were able to do the task and they completed the task." All the PABs spoke about their PPs' increasing self-efficacy and competence. One PAB shared, "at the beginning of the program it [self-efficacy] was like nonexistent, because she didn't even bother to try… but towards the end she told me, 'my confidence is so much better!'" Another PAB shared about his experience with a PP that "we did a plank, and she's never done a plank before…. [and] that one time made her excited for the rest… and we just kept improving and improving and showing [her] that [she] can do stuff, when [she didn't] realize it." He continued that, "I know now she feels way more comfortable, like if I'll say, 'we're going to do dumbbell

press,' she knows exactly what to do, and she says, 'I got this!'… her confidence shot up." Another PAB reported that "she [the PP] got comfortable enough with me to try new things and she realized that she could do more," and that in the beginning of the program, "she really felt like she couldn't exercise or she couldn't do some of the things… towards the end she told me, 'my confidence is so much better'… and [she was] proud of any accomplishment that she made." Another PAB shared "one of the best moments for me in the whole program was we started rock-climbing, and on the first day she could only hang on two holds and then she would just drop, like she didn't have the strength or whatever, and then two weeks ago she made it all the way to the top of the rock wall the first time. I was stoked and she was stoked, and obviously it was such an awesome moment!" He also reported that while he believed social interaction was the most beneficial element, "building that confidence and comfortability in exercise environments" was the second most beneficial for his PPs. Another PAB reported, "I definitely think that throughout the program her [the PP's] self-efficacy definitely increased. One day I got there on time but she had gotten there early and was already on the machine herself. Just in terms of comfort with doing it on her own, that really improved over time." One PP, who had very little self-efficacy for exercise in the beginning of the program, said (regarding any changes in her exercise and/or comfort levels participating in physical activity), "Definitely,

when we first started she [the PAB] would say, 'Oh, let's try this exercise' and in my head I was like, 'No way can I do that! I'm not strong enough!' But, I was able to do it! So, I think that, yes, I was able to do things that I had no idea that I could. And it was awesome!"

Autonomy and Self-Selected Activity

When asked about the importance of being able to self-select their own modes of physical activity, there was mixed support for autonomy from PPs; however, both HCPs and PABs recognized the importance of fostering autonomy in their PPs. While one PP said autonomy was "pretty important" and "I really loved that I was able to choose my own [physical activity]", the other PPs preferred to have their PABs select and guide the physical activity sessions. One PP said, "it wasn't that important to me because I didn't know where to start. I like that she [the PAB] took the lead," and that if there was something she wasn't interested in trying, she would let her PAB know and they could choose another activity. Another PP said, "It wasn't that important to me. I'd rather have them choose."

PABs felt more strongly about the importance of autonomy. When asked which aspects worked well overall in the program, one PAB said, "I think just the fact that we… had the freedom to choose different activities." Another PAB said, "I would

give them [PPs] options, like, 'so we're going to do a leg workout, which leg workout would you like to try?' and they would pick. I figured having them decide within a parameter was easier for them than just saying "what do you want to do now?" One HCP spoke about encouraging students to participate in the program because of the opportunity to not only to be "learning something new," but also to learn "something that you and your buddy can figure out" by working together to select activities.

Other factors to consider

While the initial scope of this study sought to examine the above themes as mechanisms for helping to reduce depression and anxiety, several additional themes were uncovered through interviews with the participants. These themes included nature, routine or consistency, and additional overall healthier lifestyle changes.

Nature. While PPs and PABs had the option of participating in physical activities indoors and/or outdoors, several participants brought up the importance of exercising in nature in their interviews. One PP said that being in "the outdoors here, in the beautiful nature," was the most beneficial aspect for her after the actual physical activity itself. One HCP spoke to the importance of "outside activities." One PAB shared that she and her PP gained benefit by "going on forest runs and running around the track." Another PAB said, "green exercise or exercising outside is something that is really a beneficial part."

Routine/Consistency. Another theme uncovered as a beneficial mechanism highlighted by the HCPs, PPs, and PABs was routine. All the HCPs spoke to the

importance of routine or structure in helping students with depression and/or anxiety. One HCP said that she thought the most beneficial aspect "was the structure. It was a simple task with steps that they [PPs] could follow it, wasn't complex or complicated… they really appreciated the consistency of it… The consistency and routine is helpful." Another HCP spoke to the benefit of having a "routine established" while another said, according to direct feedback she received from a PP, the most beneficial aspect was "the commitment of meeting with someone and the social thing of having someone that they were going to meet with… was really helpful." PPs also found routine beneficial, not only in the consistency of meeting up regularly, but also building familiarity with exercise consistency, with one PP sharing, "we tried to stick to a similar routine every time when we met in the gym. And I liked that a lot." In regard to the benefit of being consistent, one PAB said, we "would go into a regular routine: lower body, upper body, back, & also cardio…. it only takes a little bit of time to get yourself better overall, over time."

Overall healthier lifestyle changes. Participants from each of the three groups reported that throughout the course of the program, PPs adopted healthier lifestyle habits in other areas of their lives in addition to being more physically active. HCPs, PABs, and PPs all believed that as PPs began reducing their depression and anxiety, they were able to make healthier choices in regard to several other aspects of their lives such as diet, living circumstances, and relationships. One HCP shared, "once they [the PPs she referred to the program] were treating their bodies better, that also affected the way they

wanted to care for their bodies, like what they wanted to eat, so I think that helps in the relationship like 'ok this is how my body feels when I take care of it and I also want to feed it healthier things.'" One PAB said that her PP "just decided to move out of her current place, because she doesn't like the living situation" and followed up that she believed the program had an effect on that decision by saying, "being able to talk about it, and just the physical activity benefits too, I feel like it keeps you level-headed a little bit." Some additional insights from PABs about their PPs included, "she cleaned up her diet, too, during this program" and that another PP became "more conscious about diet" and increased her "awareness of lifestyle."

Benefits for the Physical Activity Buddy

In addition to the effects and benefits for the PPs there were benefits reported for the PABs. The main recurring theme of benefit for PABs included positive feelings of being of service and assisting in beneficial changes for another. One PAB said that his experience in the program was excellent due to "just being able to be an effective outlet for somebody else to make changes in their life that are going to benefit them… that's what made it a great experience for me… I can't say anything bad about my experience." Another PAB spoke to how "doing something selfless, it was rewarding" and continued that working out with people in this way would "be something that I'd like to do in my career... 'come work out with me and I'll listen to you.'"

Another recurring theme of benefits for the PABs was development of self and life skills, including predominantly increased compassion and knowledge of self. One PAB said the program "impacted my life a lot. It showed me who I am trying to show up to be" and that the program helped her in "learning how to be more patient, refined, understanding, have more open communication with people." Another PAB reported, "I'm a lot more understanding… I'm definitely going to try a lot more, even if people are kind of quiet or something, I'm more likely to probably go out of my way." Several PABs reported that the program was beneficial in increasing their communication skills. One PAB said the program "helped my people skills and communication and listening skills" while another said that he learned to "have compassion and heart… to have an open ear, [to be an] active listener." Another PAB said, "I learned that it's something [depression and anxiety] that most of us can relate to, and that most of us are working through similar issues on different levels" and she continued that she learned "the power of showing up and holding space for other people to show up."

Additional factors of benefit for the PABs included increased time management skills, accountability, and increased physical activity. One PAB said the program "definitely taught me time management." Another PAB said, "the accountability thing is awesome because it works both ways. It's like I feel just as

responsible to exercise because now I have a responsibility to them… I'm just as prone to be like, 'oh I have finals, I have this or that' and exercise is always first on the chopping block. And with this it's like, nope, it doesn't matter if it's on the chopping block, you're going to go work out with this person. So it kind of makes you realize at the end of the day you do have - like the time is there, you just have to make it a priority to do it, and so I would say rekindling that understanding of how much I need exercise and how I always have the time for exercise even though I think I don't, I think for me that's the biggest best thing - I don't need to cut out exercise."

DISCUSSION

In light of what is already known about rising rates of depression and anxiety on college campuses, the findings of the present study are significant because they illuminate a contributing solution to help alleviate the nationwide problem. This study showed the effectiveness of a peer-supported, self-selected physical activity program for college students with depression and anxiety. Additionally, this study uncovered the mechanisms that provided the most benefit for students with depression and/or anxiety. Participation in this program was shown to benefit not only the PPs, but also the PABs who supported them, which provides evidence that a program such as this one may provide a cost-effective resource to supplement the resources offered by overburdened campus health care centers.

Changes in depression and anxiety

It was hypothesized that program participants in the peer-supported, self-selected physical activity program would experience a decrease in depression and anxiety from the beginning to the end of the program, as the antidepressant and anxiolytic effects of physical activity have been well-documented (Cai, 2000; Craft, 2005; Weinberg & Gould, 2015; Wipfli, Landers, Nagoshi & Ringenbach, 2011;

Woolery, Myers, Sternlieb, & Zeltzer, 2004). This hypothesis was supported as the results showed that participants from each of the three groups (PPs, PABs, and HCPs) found the intervention to have significantly beneficial psychological effects for PPs with depression and anxiety. All PPs reported that the intervention had a significant effect on reducing their depression and/or anxiety, both acutely immediately after exercise sessions as well as chronically over the duration of the semester.

Themes and Mechanisms

The changes in depression and anxiety and the improvement of overall mood were due to many overlapping factors and mechanisms that are discussed in further detail below. Based on the theoretical background of this program, the researchers expected the results would provide support for the deductive themes outlined including peer-support/relatedness, physical activity, self-efficacy/competence, and autonomy or the ability to self-select physical activity. Results showed support for all these themes except for autonomy, which had mixed support.

Peer-Support, Relatedness, and Physical Activity

Throughout the data analysis one theme that continued to be discussed with potency and significant effectiveness was the combination of human connection with physical activity. Based on previous research, it was expected that both relatedness

and physical activity would be uncovered individually as significantly beneficial mechanisms; however, the compound effectiveness of the two together was surprising to the participants and therefore of particular interest to the research team. It has been well documented that peer-support is an effective element in increasing intrinsic motivation (Deci & Ryan, 2008), and the results from this study add to the growing field of research about the use of peer-support for depression and anxiety, especially in college students (Basudan, Binanzan, & Alhassan, 2017; Jibeen, 2016).

There is also a growing body of research on loneliness and social isolation as another risk factor for young adults that can have a wide variety of negative effects. In a recent nationwide study, The Cigna U.S. Loneliness Index (2018), over 20,000 individuals completed a survey and results showed that loneliness was highly prevalent, especially among young adults ages 18-22, and students were found to have even more elevated loneliness scores. These findings are crucial because loneliness has been found to have significant negative impacts on physical and mental health, with the same impact on mortality as smoking 15 cigarettes a day, making loneliness even more dangerous than obesity (Cigna, 2018). Results from this study also showed effective mediators to loneliness, most significantly regular in-person interactions (Cigna, 2018). Therefore, this present study directly addresses the need

for regular in-person interactions and how those interactions may help prevent social isolation in young adults.

One additional aspect in regard to the combination of physical activity and relatedness together is the concept of Walk and Talk. Previous researchers have examined the benefits of the concept of Walk and Talk, participating in physical activity such as walking along with counseling, and have found the combination to be significantly beneficial (Doucette, 2004; Revell & McLeod, 2016). One factor that has be cited as specifically beneficial is the aspect of walking side-by-side which can promote a collaborative way of working (Revell & McLeod, 2016). This aspect was found to be evident in the present study as well, as both PPs and PABs reported that they found it easier to talk and for a deeper connection while walking together versus in other activities.

Self-Efficacy/Competence

Data analysis also showed support for self-efficacy and competence. PPs, PABs, and HCPs all reported significant changes in PPs regarding self-efficacy for exercise, competence, and overall increases in self-confidence. As the PPs gained self-efficacy for exercise, they also improved their overall self-confidence. The research team had anticipated that self-efficacy for exercise would be beneficial for reducing depression

and anxiety as previous research on self-efficacy in college students has shown similar results (Ryan, 2008; Wei, Russell, & Zakalik, 2005). The mechanism of self-efficacy and competence was responsible for how PPs perceived themselves and how they cared for themselves, including factors such as improved social interactions and healthier diet.

Autonomy and Self-Selected Activity

Some participants found autonomy, or the ability to self-select their mode of physical activity to be "very important" whereas other PPs preferred to have their PABs select and lead the physical activities. Even with the mixed support shown for autonomy, the research team maintains that the autonomy to select one's own physical activity is a foundational element of the program upon which the effectiveness partially rests. The data analysis affirmed that although some PPs preferred to have their PABs to select and lead the activity, ultimately what remains important is allowing each pair (PP and PAB) to work together to create their desired physical activities. Previous research has shown autonomy to be an integral aspect in fostering high quality intrinsic motivation (Amorose, Anderson-Butcher, Newman, Fraina, & Iachini, 2016; Deci & Ryan, 2008), so although the present study did not find support for the hypothesis that autonomy as a mechanism for reducing

depression and anxiety, its importance in the program should not be overlooked. Further research is recommended to uncover how the ability to self-select physical activity may affect individuals with depression and anxiety directly.

Other factors to consider

In addition to these deductive themes, support was also found for inductive themes that were uncovered through analysis, including nature, routine, and additional lifestyle changes. These themes were unanticipated for this specific study; however, current research supports the efficacy of these mechanisms as beneficial elements in helping to alleviate depression and/or anxiety (Berman et al., 2012; Gage, Coker, & Jobson, 2015), and the present study adds to that body of research. There is a growing body of research on "green exercise" and the benefits of exercising in nature to reduce depression and anxiety (Gladwell, Brown, Wood, Sandercock, & Barton, 2013; Pretty et al., 2007) and to affect mental health of college students specifically (Olafsdottir, Cloke, & Vögele, 2017). Additional beneficial effects for PPs in the program, including being able to stop taking antidepressants, more positive self-talk (speaking kindly about themselves), healthier eating habits, being more social, and moving out of undesirable living conditions were not directly hypothesized. However, these findings are congruent with and add to the body of research that

shows that as individuals reduce their depression and anxiety, they may improve their overall quality of life in many sectors (Olatunji, Cisler, & Tolin, 2007). These changes were due to the reduction in the PPs' depression and anxiety and are tangible effects of the intervention.

Benefits for the Physical Activity Buddy

It was hypothesized that the program would be beneficial for the PABs providing the peer-support. In addition to the benefits for the students with depression and anxiety, there were significant benefits for the PABs who provided the peer-support. The PABs gained confidence in communication skills and working with others, as well as improved their time management skills and improved their exercise adherence. The most striking benefit the PABs reported was their increased compassion and their understanding of the power of relatedness and human connection. Although the PABs anticipated that participation in the intervention would be enjoyable or beneficial, they were often surprised or taken aback by how impactful and transformational their experience was in terms of being of service to others. There is a growing body of research on altruism and being of service facilitating health and wellbeing in another individual (Post, 2005), and the present study adds to that research by exploring how the PABs themselves benefited

significantly by supporting others. Additionally, the eudaimonic approach to understanding happiness and well-being helps explain why the PABs may have enjoyed the program and received more benefit then they had anticipated.

The eudaimonic approach to understanding happiness focuses on the development of meaning and self-realization rather than the hedonic approach of creating happiness, which defines well-being in terms of pleasure attainment and pain avoidance (Ryan & Deci, 2001; Steger, Kashdan, & Oishi, 2008). As the PABs provided the peer-assistance to the PPs and were able to observe the changes in the PPs over the course of the program, they were creating benefit for themselves by being of service to another.

Considerations for Health Care Centers

All three HCPs referred several PPs to the program; however, there was a wide range in the amount of direct feedback or ongoing interaction HCPs had with PPs. One HCP, a counselor, had continuous sessions and interactions with several PPs that she referred to the program. She was able to observe significant changes in the PPs and received direct feedback about their experiences in the program. Of the other two HCPs, one had very little follow-up contact with the PPs she referred, only getting direct feedback from one PP. This example signifies the direct effect of the overburdened healthcare centers that do not have the resources for HCPs to follow-

up with students and provide the ongoing care students may need. All of the HCPs spoke of the rising rates of depression and anxiety and their limited abilities to be able to provide services to students in need. One HCP expressed her gratitude for the program, expressing the prevalence of anxiety and depression of students on campus and quantity of anxiety and depression medications she was prescribing. Another HCP expressed a similar concern regarding the number of students seen with anxiety and depression, and the feedback she has received from the campus HCPs overall is that they enjoy having this program as a resource to offer to students instead of or in addition to medication.

LIMITATIONS AND FUTURE RESEARCH RECOMMENDATIONS

Although this study shows promise, there are several limitations and recommendations for further research to understand how the present findings may be applied to a wider population. One limitation of this study was the small sample size. A relatively small sample population is common in qualitative research as qualitative research aims to gain deep understanding of phenomena focusing on the meaning of a particular issue, situation, subculture, or social interaction (Dworkin, 2012). The aim of qualitative studies, such as this one, is not to collect large numbers of data, but to gather the in-depth lived experiences of enough individuals to glean common themes and to understand the relationships between those themes (Charmaz, 2006), which occurred in this study. Although, the sample was small, we believe that saturation was achieved. Saturation is described as the point where continuing to collect additional samples would not lead to additional insights, themes, or connections between existing themes (Dworkin, 2012). However, even with achieving saturation, the findings of this small study should be replicated and expanded in greater depth before generalizing and applying it to wider populations.

Another limitation of the present study is that while all PABs participated in the interviews, not all PPs and HCPs who were part of the program were

interviewed. The PPs and HCPs volunteered to participate in the study and, therefore, individuals who felt the program was especially beneficial may have been more likely to respond to e-mail requests to participate. This may have skewed the findings by the research team not having the opportunity to interview participants who may have felt indifferent about either the program or the task of being interviewed. Additionally, the interviews were conducted during the last week of the semester or during finals week, which may have resulted in fewer participants volunteering to be interviewed due to busy schedules.

As mentioned, this study was conducted at the end of the semester in which individuals participated in the program, and therefore, does not discuss the longer-term or ongoing effects of participation in an intervention such as this one. The recommendation for future research would be to conduct a longitudinal research study, such as conducting additional interviews at the end of the semester following participation in the program, whether or not the individual had participated in the program again and/or was still physically active, as well as one year later. This would lend to a greater understanding of the impact of the intervention on the PPs' lives moving beyond the immediate time they participated in the program.

The lack of a control group is another limitation of this study, which means it did not undertake a true experimental study design. This decision was intentional, as

to withhold a potentially beneficial program from students experiencing symptoms of depression and/or anxiety would have been unethical. Additionally, the research team acknowledges the limitation that there are several factors other than this program (e.g., medication, counseling) that could have caused benefit to the participants and we also intentionally did not specify that participants' engagement in other treatment modalities would be used as exclusion criteria, as that would have also been an ethical issue to in any way ask students with anxiety and/or depression to not seek all potential modes of receiving support. One possible alternative for future research to utilize a control group would be to conduct interviews with individuals in a wait-to-treat group as well as in the participants receiving this intervention. This seems plausible as the health care center in this present study had a waitlist of students with depression and/or anxiety who were interested in the program; however, there were not enough PABs to accommodate them all.

PRACTICAL IMPLICATIONS

Although there are limitations to this study, the results showed significant effects for all PPs, PABs, and HCPs, and highlighted a cost-effective program that could benefit colleges nationwide. With the rising rates of mental health disturbances on college campuses and the growing need to support campus healthcare centers and providers, results from this study showed the benefits of a program which is a solution that is effective, affordable, and practical to implement. All of the HCPs interviewed for this study found the intervention to be significantly beneficial and wished that the program was larger to be able to help more of the students that they serve.

CONCLUSION

The years young adults spend on college campuses can be a challenging period in which they have increased susceptibility to mental health problems such as depression and anxiety. However, these years are also ripe with the potential to help students develop beneficial behaviors to facilitate their mental health as well as their physical health for the duration of their lives. With mental health disturbances on the rise across campuses nationwide, it is becoming increasingly important to help vulnerable students. The present study showed the effectiveness of a program that reduced depression and anxiety, and uncovered the mechanisms that facilitated these changes, which included the combination relatedness/peer-support and physical activity, self-efficacy and competence, and other factors. In addition, results showed the theme of altruism or being of service and helping others produced significantly beneficial effects in the lives of the students who provided peer-support for individuals with depression and/or anxiety. Therefore, the finding of this qualitative study demonstrated the effectiveness and the beneficial mechanisms of a peer-assisted, self-selected physical activity program on depression and anxiety in college students.

REFERENCES

American College Health Association. (2016). American College Health Association National College Health Assessment II: Undergraduate Student Reference Group Executive Summary Spring 2016. Retrieved from: http://www.acha-ncha.org/reports_ACHA-NCHAIIc.html

Amorose, A., Anderson-Butcher, D., Newman, T., Fraina, M., & Iachini, A. (2016). High school athletes' self-determined motivation: The independent and interactive effects of coach, father, and mother autonomy support. *Psychology of Sport & Exercise, 26*, 1-8.

Anxiety and Depression Association of America. (2014, May). Understand the facts. Retrieved from https://www.adaa.org/understanding-anxiety

Bandura, A. (1997). Self-efficacy. *Harvard Mental Health Letter, 13*(9), 4-6.

Basudan, S., Binanzan, N., & Alhassan, A. (2017). Depression, anxiety and stress in dental students. *International Journal of Medical Education, 8*, 179-186.

Berman, M., Kross, E., Krpan, K., Askren, M., Burson, A., Deldin, P., ... Jonides, J. (2012). Interacting with nature improves cognition and affect for individuals with depression. *Journal of Affective Disorders, 140*(3), 300-305.

Bracke, P., Christiaens, W., & Verhaeghe, M. (2008). Self-esteem, self-efficacy, and the

balance of peer support among persons with chronic mental health problems. *Journal of Applied Social Psychology, 38*(2), 436-459.

Broman-Fulks, J., Berman, M., Rabian, B., & Webster, M. (2004). Effects of aerobic exercise on anxiety sensitivity. *Behaviour Research and Therapy, 42*(2), 125-136.

Cai, S. (2000). Physical exercise and mental health: A content integrated approach in coping with college students' anxiety and depression. *Physical Educator, 57*(2), 69-76.

Center for Collegiate Mental Health. (2014, January). 2013 Annual Report. Retrieved from http://ccmh.psu.edu/

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London: Sage Publications.

Cigna U.S. Loneliness Index. (2018). Retrieved from https://www.multivu.com/players/English/8294451-cigna-us-loneliness-survey/docs/IndexReport_1524069371598-173525450.pdf

Craft, L. (2005). Exercise and clinical depression: Examining two psychological mechanisms. *Psychology of Sport & Exercise, 6*(2), 151-171.

Compas, B., Wagner, B., Slavin, L., & Vannatta, K. (1986). A prospective study of life events, social support, and psychological symptomatology during the transition from high school to college. *American Journal of Community Psychology, 14*(3), 241-257.

Daley, A. (2008). Exercise and depression: A review of reviews. *Journal of Clinical Psychology in Medical Settings, 15*(2), 140-147.

Deci, E., & Ryan, R. (2008). Self-determination theory: A macrotheory of human motivation,

development, and health. *Canadian Psychology, 49*(3), 182-185.

De Moor, M., Beem, A., Stubbe, J., Boomsma, D., & De Geus, E. (2006). Regular exercise, anxiety, depression and personality: A population-based study. *Preventive Medicine*, *42*(4), 273-279.

Dinas, P., Koutedakis, Y., & Flourish, A. (2011). Effects of exercise and physical activity on depression. *Irish Journal of Medical Science, 180*(2), 319-325.

Doucette, P. (2004). Walk and talk: An intervention for behaviorally challenged youths. *Adolescence, 39*(154), 373-388.

Dworkin, S. L. (2012). Sample size policy for qualitative studies using in-depth interviews. *Archives of Sexual Behavior, 41*(6), 1-2.

Edmunds, J., Ntoumanis, N., & Duda, J. (2007). Adherence and well-being in overweight and obese patients referred to an exercise on prescription scheme: A self-determination theory perspective. *Psychology of Sport & Exercise*, *8*(5), 722-740.

Ernst, E. (2000). Abc of complementary medicine. *Focus on Alternative and Complementary Therapies*, *5*(3), 231-231.

Ensari, I., Greenlee, T. A., Motl, R. W., & Petruzzello, S. J. (2015). Meta-analysis of acute exercise effects on state anxiety: An update of randomized controlled trials over the past 25 years. *Depression and Anxiety, 32*, 624-634.

Fletcher, J., & Banasik, J. (2001). Exercise self-efficacy: Clinical excellence for nurse practitioners. *The International Journal of NPACE, 5*(3), 134-143.

Fuhr, D., Salisbury, T., De Silva, M., Atif, N., van Ginneken, N., Rahman, A., & Patel, V.

(2014). Effectiveness of peer-delivered interventions for severe mental illness and depression on clinical and psychosocial outcomes: A systematic review and meta-analysis. *Social Psychiatry and Psychiatric Epidemiology, 49,* 1691-1702.

Gage, E., Coker, S., & Jobson, L. (2015). Cross-cultural differences in desirable and undesirable forms of self-consistency and influence on symptoms of depression and anxiety. *Journal of Cross-Cultural Psychology, 46*(5), 713-722.

Gladwell, V. F., Brown, D. K., Wood, C. R., Sandercock, G. L., & Barton, J. (2013). The great outdoors: How a green exercise environment can benefit all. *Extreme Physiology and Medicine, 2*(1), 1-7.

Greenberg, P., Fournier, A., Sisitsky, T., Pike, C., & Kessler, R. (2015). The economic burden of adults with major depressive disorder in the United States (2005 and 2010). *The Journal of Clinical Psychiatry, 76*(2), 155-162.

Greenberg, P., Kessler, R., Birnbaum, H., Leong, S., Lowe, S., Berglund, P., & Corey-Lisle, P. (2003). The economic burden of depression in the United States. *The Journal of Clinical Psychiatry, 64*(12), 1465-1475.

Greenberg, P., Stiglin, L., Finkelstein, S., & Berndt, E. (1993). The economic burden of depression in 1990. *The Journal of Clinical Psychiatry, 54*(11), 405-418.

Greenberg, P., Sisitsky, T., Kessler, R., Finkelstein, S., Berndt, E., Davidson, J., ... Fyer, A. (1999). The economic burden of anxiety disorders in the 1990s. *The Journal of Clinical Psychiatry, 60*(7), 427-435.

Hoffman, D., Dukes, E., & Wittchen, H.-U. (2008). Human and economic burden of generalized anxiety disorder. *Depression and Anxiety, 25*, 72–90.

Hwang, S. (2008). Utilizing qualitative data analysis software: A review of Atlas.ti. *Social Science Computer Review*, *26*(4), 519-527.

Jibeen, T. (2016). Perceived social support and mental health problems among Pakistani university students. *Community Mental Health Journal, 52*(8), 1004-1008.

Kessler, R., Chiu, W., Demler, O., & Walters, E. (2005a). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the national comorbidity survey replication. *Archives of General Psychiatry*, *62*(6), 617-627.

Kessler, R., Berglund, P., Demler, O., Jin, R., & Walters, E. (2005b). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication (NCS-R). *Archives of General Psychiatry*, *62*(6), 593-602.

Kessler, R. (2012). The costs of depression. *The Psychiatric Clinics of North America, 35*(1), 1-14.

Kessler, R., Berglund, P., Demler, O., Jin, R., Koretz, D., Merikangas, K. R., … Wang, P. (2003). The epidemiology of major depressive disorder: Results from the national comorbidity survey replication (NCS-R). *Journal of the American Medical Association, 289*(23), 3095-3105.

Kirsch, D., Pinder-Amaker, S., Morse, C., Ellison, M., Doerfler, L., & Riba, M. (2014). Population-based initiatives in college mental health: Students helping students to overcome obstacles. *Current Psychiatry Reports*, *16*(12), 1-8.

Lewis, S. (2015). Qualitative inquiry and research design: Choosing among five approaches. *Health Promotion Practice, 16*(4), 473-475.

Louie, L. (2014). The effectiveness of yoga for depression: A critical literature review. *Issues in Mental Health Nursing, 35*(4), 265-276.

Lox, C., Martin Ginis, K., & Petruzzello, S. (2014). *The psychology of exercise: Integrating theory and practice* (3rd ed.). Scottsdale, AZ: Holcomb Hathaway.

Martin, L., Williams, S., Haskard, K., & Dimatteo, M. (2005). The challenge of patient adherence. *Therapeutics and Clinical Risk Management, 1*(3), 189-199.

Mead, S., Hilton, D., & Curtis, L. (2001). Peer support: A theoretical perspective. *Psychiatric Rehabilitation Journal, 25*(2), 134-141.

Merom, D., Phongsavan, P., Wagner, R., Chey, T., Marnane, C., Steel, Z., . . . Bauman, A. (2008). Promoting walking as an adjunct intervention to group cognitive behavioral therapy for anxiety disorders—A pilot group randomized trial. *Journal of Anxiety Disorders, 22*(6), 959-968.

Mowbray, C., Megivern, D., Mandiberg, J., & Strauss, S. (2006). Campus mental health services: Recommendations for change. *American Journal of Orthopsychiatry, 76*(2), 226-237.

Moussavi, S., Chatterji, S., Verdes, E., Tandon, A., Patel, V., & Ustun, B. (2007). Depression, chronic diseases, and decrements in health: Results from the World Health Surveys. *The Lancet, 370*(9590), 851–858.

National Institute of Mental Health (NIMHa). (2016, March). Anxiety disorders. Retrieved from

http://www.nimh.nih.gov/health/topics/anxiety-disorders/index.shtml

National Institute of Mental Health (NIMHb). (2016, May). Depression. Retrieved from http://www.nimh.nih.gov/health/topics/depression/men-and-depression/signs-and-symptoms-of-depression/index.shtml

National Institute of Mental Health (2011). No health without mental health. Retrieved from: https://www.nimh.nih.gov/about/directors/thomas-insel/blog/2011/no-health-without-mental-health.shtml

Olafsdottir, G., Cloke, P., & Vögele, C., (2017). Place, green exercise and stress: An exploration of lived experience and restorative effects. *Health and Place, 46,* 358-365.

Olatunji, B., Cisler, J., & Tolin. D., (2007). Quality of life in the anxiety disorders: A meta-analytic review. *Clinical Psychology Review, 27*(5), 572-581.

Pretty, J., Peacock, J., Hine, R., Sellens, M., South, N., & Griffin, M. (2007). Green exercise in the UK countryside: Effects on health and psychological well-being, and implications for policy and planning. *Journal of Environmental Planning and Management, 50*(2), 211-231.

Pope, C., Ziebland, S., & Mays, N. (2000). Analysing qualitative data. *British Medical Journal, 320*(7227), 114-116.

Post, S. G. (2005). Altruism, happiness, and health: It's good to be good. *International Journal of Behavioral Medicine, 12*(2), 66-77.

Ravindran, L., & Stein, M. (2010). The pharmacologic treatment of anxiety disorders: A review of progress. *Journal of Clinical Psychiatry, 71*(7), 839-854.

Revell, S., & McLeod, J. (2016). Experiences of therapists who integrate walk and talk into their professional practice. *Counseling and Psychotherapy Research, 16*(1), 35-43.

Ryan, R., & Deci, E. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*(1), 141-166.

Ryan, M. (2008). The antidepressant effects of physical activity: Mediating self-esteem and self-efficacy mechanisms. *Psychology & Health, 23*(3), 279-307.

Sabourin, B., Hilchey, C., Lefaivre, M., Watt, M., & Stewart, S. (2011). Why do they exercise less? Barriers to exercise in high-anxiety-sensitive women. *Cognitive Behaviour Therapy, 40*(3), 206-215.

Shally-Jensen, M. (2013). *Mental health care issues in America: An encyclopedia* (Gale virtual reference library). Santa Barbara, Calif.: ABC-CLIO.

Smith, A. (2003). Peer relationships in physical activity contexts: A road less traveled in youth sport and exercise psychology research. *Psychology of Sport & Exercise, 4*(1), 25-39.

Solomon, P., & Anthony, W. (2004). Peer support/peer provided services underlying processes, benefits, and critical ingredients. *Psychiatric Rehabilitation Journal, 27*(4), 392-401.

Stanton, R., & Reaburn, P. (2014). Exercise and the treatment of depression: A review of the exercise program variables. *Journal of Science and Medicine in Sport, 17*(2), 177-182.

Steger, M., Kashdan, T., & Oishi, S., (2008). Being good by doing good: Daily eudaimonic activity and well-being. *Journal of Research in Personality, 42*(1), 22-42.

Ströhle, A. (2009). Physical activity, exercise, depression and anxiety disorders. *Journal of Neural Transmission*, *116*(6), 777-784.

Teixeira, P., Carraça, E., Markland, D., Silva, M., & Ryan, R. (2012). Exercise, physical activity, and self-determination theory: A systematic review. *The International Journal of Behavioral Nutrition and Physical Activity*, *9*(1), 78-108.

Temple, V., & Stanish, H. (2011). The feasibility of using a peer-guided model to enhance participation in community-based physical activity for youth with intellectual disability. *Journal of Intellectual Disabilities, 15*(3), 209-217.

Wang, P., Lane, M., Olfson, M., Pincus, H., Wells, K., & Kessler, R. (2005). Twelve-Month Use of Mental Health Services in the United States. *Archives of General Psychiatry,62*(6), 629. doi:10.1001/archpsyc.62.6.629

Wei, M., Russell, D. W., & Zakalik, R. A. (2005). Adult attachment, social self-efficacy, self-disclosure, loneliness, and subsequent depression for freshman college students: A longitudinal study. *Journal of Counseling Psychology*, *52*(4), 602-614.

Weinberg, R.S., & Gould, D. (2015). *Foundations of sport and exercise psychology* (6th ed.). Champaign, IL: Human Kinetics.

Wipfli, B., Landers, D., Nagoshi, C., & Ringenbach, S. (2011). An examination of serotonin and psychological variables in the relationship between exercise and mental health. *Scandinavian Journal of Medicine & Science in Sports*, *21*(3), 474-481.

Woolery, A., Myers, H., Sternlieb, B., & Zeltzer, L. (2004). A yoga intervention for young adults with elevated symptoms of depression. *Alternative Therapies, 10(2),* 60-63.

World Health Organization. (2018, March). Depression. Retrieved from http://www.who.int/mediacentre/factsheets/fs369/en/

APPENDIX

Interview Questions for Participants

All questions can be answered on a voluntary basis. Feel free to pass on any questions you do not wish to answer. Please do not to identify physical activity buddies by name.

1) Overall, how would you rate the quality of your WellFit experience?

   On a scale of 1 (poor) to 5 (excellent)

   a) Explain your rating above.

2) What worked well for you during the program?

3) What about the program did not work for you, and/or what could be done to improve your experience?

4) Please rate the quality of your physical activity buddy in the following areas:

   On a scale of 1 (poor) to 5 (excellent) and please feel free to share your reasoning about any of these scores.

a) Knowledge of physical activities

b) Understanding of your thoughts, feelings, and experiences

c) Availability

d) Approachability

e) Compassion

5) How did the WellFit program impact your life overall?

6) Did your anxiety and/or depression change over the course of the program?

   a) If so, how much?

   b) What factor/s do you think had the biggest effect?

7) Did your physical activity levels increase during the program?

   a) Do you think you will continue to be physically active after the program?

8) Has your knowledge about exercise and/or comfort levels participating in physical activities changed throughout the program? Please explain.

9) How important was it for you to be able choose and select your own physical activities and why?

10) Were there any ongoing themes or recurring topics or ideas that came up for you over the course of the program?

11) Please share any additional information you would like to add.

Interview Questions for Physical Activity Buddies

All questions can be answered on a voluntary basis. Feel free to pass on any questions you do not wish to answer. Also, please do not to identify participants by name.

1) Why did you sign up to participate in the program?
2) Describe your overall experience of participating in the WellFit program.
    a) What are some aspects that worked well for you?
    b) What are some things that did not work well for you?
3) At the beginning of the program, how much self-efficacy with physical activity and/or experience with exercise did your participants have? (Self-efficacy can be defined as the belief that an individual can successfully perform a specific behavior or task)
    a) Do you think their self-efficacy and/or knowledge of physical activities changed throughout the program?
    b) If so, in what ways?
4) Did any of your participants talk with you about their anxiety or depression?
    a) If so, what did they share?
5) Do you think this program was beneficial for your participants?

a) If so, how beneficial?

b) What do you think were the most beneficial aspects?

6) Did you notice any changes (e.g., physical, emotional, psychological) in your participants over the course of the program (not already mentioned above)?

7) How did the WellFit program impact your life?

8) What did you learn or gain from this experience and did you learn anything unexpected? Please explain.

9) What did you learn about working with people with depression and anxiety?

10) Did you have any prior experience in your life (either in yourself or friends/family) with anxiety and/or depression?

11) Overall, how would you rate the quality of your WellFit experience?

On a scale of 1 (poor) to 5 (excellent)

a) Explain your rating above.

12) What could be done to improve the program not already discussed in your responses to the questions above?

13) Were there any ongoing themes or recurring topics or ideas that came up for you over the course of the program?

14) Please share any additional information you would like to add.

Interview Questions for Health Care Providers

All questions can be answered on a voluntary basis. Feel free to pass on any questions you do not wish to answer. Also, please do not to identify participant or physical activity buddy's by name.

1) How many students did you refer to participate in the WellFit Program?
2) What were the main reasons or motivations or criteria for referring those students to the program?
3) Describe your overall sense of the experience of the WellFit program for the participants.
    a) What do you think worked well for them?
    b) What do you think did not work well for them?
4) Do you think this program was beneficial for the participants in reducing depression and/or anxiety?
    a) If so, how beneficial?
5) Which aspects do you think were the most beneficial (e.g. self-efficacy, autonomy, competence, relatedness)?
6) Did you notice any changes (e.g., physical, emotional, psychological) in the participants that you think was likely directly related to the program (not already mentioned above)?
7) Overall, how would you rate the quality of the WellFit experience for the participants? On a scale of 1 (poor) to 5 (excellent)
    a) Explain your rating above.
8) How likely would you be to refer students to the WellFit Program in the future?

On a scale of 1 (not at all) to 5 (very likely)

9) In your professional opinion, what could be done to improve the program (not already discussed in your responses above)?

10) Were there any ongoing themes or recurring topics or ideas that came up for your patients over the course of the program?

11) Please share any additional information you would like to add.