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Implementation of a Physical Activity Group at
a Community Mental Health Center:
A Pilot Quality Improvement Project to Reduce Depressive Symptoms in Adolescents
with Major Depressive Disorder
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Abstract

Major Depressive Disorder is a debilitating illness that affects millions of Americans, including adolescents. The majority of adolescents with Major Depressive Disorder (MDD) do not receive treatment. There may be a variety of reasons for this including stigma, access to care, and potential adverse reactions. People suffering from MDD are known to be at high risk for suicide. Lack of treatments adds the risk of suicide for adolescents with MDD. Identifying and implementing treatment options that are more acceptable and accessible are of the utmost importance. Although there is limited research regarding exercise/physical activity, depressive symptoms, and adolescents with MDD, there are two promising studies by Hughes, Barnes, Barnes, DeFina, Nakonezny, & Graham (2013) and Finazzi, Mesquita, Lopes, Fu, & Oliveira (2009). Currently, there is a physical activity program at Lakes Region Mental Health for adult patients. Unfortunately, adolescents do not have access to a similar group. This Doctorate of Nursing Practice (DNP) Quality Improvement (QI) Project piloted an eight-week physical activity group for adolescents with MDD to determine the impact physical activity had on depressive symptoms. The PHQ-9 for Adolescents Depression Screening Tool was given to participants before joining the physical exercise group and upon completion of the physical activity group. Pre-intervention and post-intervention results of the PHQ-9 for Adolescents Depression Screening were compared and analyzed. In addition, a survey was administered at week four and upon completion of the physical activity group to gather qualitative data. The results of this Pilot DNP QI project indicate there was a decrease in the PHQ-9 for Adolescents for two out of the three participants. The qualitative data demonstrated improvement in depressive symptoms, self-esteem and social interaction for all three participants. These results

are promising and support the need for a physical activity group for adolescents with MDD at Lakes Region Mental Health Center.

Keywords: *major depressive disorder, adolescents, exercise, physical activity*

Implementation of a Physical Activity Group at a Community Mental Health Center:

A Pilot Quality Improvement Project to Reduce Depressive Symptoms

in Adolescents with Major Depressive Disorder

Introduction

Problem Description

Major Depressive Disorder (MDD) is one of the most common mental health problems in the United States (US) of America (National Institute of Mental Health, 2018). It is estimated in the US, 3.1 million adolescents experience at least one Major Depressive episode, with 2.2 million demonstrating severe impairment (National Institute of Mental Health, 2018). According to the National Institute of Mental Health approximately 60 % of adolescents ages 12-17 do not receive treatment for their MDD (2018).

Suicide is the third leading cause of death for adolescents in the US (Sadock, Sadock, & Ruiz, 2015). People suffering from MDD have a 25 times greater risk for suicide, when compared to the general population (American Association on Suicidality, 2014). Given that MDD affects 12.8 % of adolescents ages 12-17, and people suffering from MDD are a higher risk of suicide, treatment is of the utmost importance (National Institute of Mental Health, 2018).

Unfortunately, the majority of adolescents with MDD go untreated, placing them at a higher risk for suicide and decreased quality of life (National Institute of Mental Health, 2018). There may be a variety of reasons these patients go untreated, including costs, stigma, access to care, and follow through. Therefore, it is important to identify treatment options that are acceptable and accessible to patients and their families.

Selective Serotonin Reuptake Inhibitors (SSRIs) have been proven to be effective for treating adolescents with MDD (Sadock, et al., 2015). However, there are a plethora of reasons patients and families may decide this is not an option for them. Some common reasons include weight gain, stigma, sedation, and fear of increased suicidal thoughts (Hughes et al., 2013). An alternative to SSRIs could be exercise. Recently there has been research regarding the effect exercise has on mood and depression. The majority of studies have focused on adults; this can be a potentially important intervention for adolescents as well (Hughes et al., 2013).

Depression can be debilitating and effect multiple aspects of an individual's health. MDD affects people of all ages, including adolescents. Research links physical activity to improvement of depressive symptoms (Hughes et al., 2013). Currently, a physical activity program is offered to adults with MDD at Lakes Region Mental Health; however, there is no physical activity program for adolescents at Lakes Region Mental Health. The goal of this Doctorate of Nursing Practice (DNP) Quality Improvement (QI) Project was to demonstrate the impact a physical activity group can have on adolescents with depression. By collecting this information, the hope is that Lakes Region Mental Health will incorporate an ongoing exercise group for adolescents similar to the program currently offered for the adults.

Available Knowledge

In order to gain an understanding of current information related to exercise/physical activity, depression and adolescents a systematic review of the literature was completed. Title and abstracts were analyzed and reviewed for inclusion and exclusion criteria. Search terms were identified utilizing the MeSH on demand through the U.S. National Library of Medicine. Terms included Depressive Disorder, Depression, Exercise, Adolescents, and Psychiatric Rating Scales. Initially, all terms were utilized in the search, however there were minimal results so Psychiatric

Rating Scale was removed. Electronic databases searched included PUBMED, Medline, CINAHL full text, Psychinfo, Cochrane, resulting in 294 research studies. In addition, Gray Literature was searched through the BASE database, with no matching research identified. Lastly, hands searching of reference lists from articles was completed. This resulted in 5 research articles to be reviewed.

Inclusion and exclusion criteria were agreed upon by two researchers. Both researchers were Master's prepared Psychiatric Mental Health Nurse Practitioners pursuing a Doctorate of Nursing Practice. In order for the article to be included it had to address adolescents with a pre-established diagnosis of MDD and interventions including physical activity and exercise programs. Randomized Control Studies, quasi-experimental, and interventional studies were considered.

Depression due to another condition such as a medical illness, situational depression, or a different psychiatric illness such as Adjustment Disorder were excluded. Only adolescents, ages as defined as 12-17, were include, therefore any age below 12 or over 17 were excluded. Studies that focused on preventing depression were excluded. Case studies and expert opinions were excluded. Lastly, any non-English articles were excluded.

Of the 294 articles, 278 did not meet inclusion criteria. An additional five articles were found from hand searching, however those were all identified as duplicates. This resulted in sixteen full text articles that were reviewed.

After thorough review of the sixteen articles, two were accepted for the systematic review. Five of the studies excluded evaluated the effect of physical activity on preventing MDD, rather than measuring effects of physical activity on adolescents with a pre-established diagnosis of MDD. Four more articles were excluded as they measured obesity in adolescents with MDD,

rather than depression. Two articles were rejected as they were an observational study and expert opinion article. Another article that studied the effect of exercise on sleep patterns for those with MDD was not included. Lastly, one article was excluded as it measured self-efficacy and anger, as opposed to depression. The two researchers independently reviewed each of the articles for inclusion and exclusion criteria. There was 100% agreement regarding the final choice of articles.

The first study by Hughes et al. (2013) was a Blinded Randomized Control Study. Participants were randomly assigned to the EXER group or the STRETCH group. The EXER group was a vigorous exercise group while the STRETCH group was low activity that included stretching. Each group exercised three times per week for 30 to 60 minutes for twelve weeks. A mental health clinician who was blinded to the groups administered the Children's Depression Rating Scale (CDRS-R). The CDRS-R was administered at Week Zero, Week Three, Week Six, Week Nine, and Week Twelve. In addition, there was follow up at week 26 and 52. The results of the EXER and STRETCH groups were compared (Hughes et al, 2013).

The study conducted by Hughes et al. (2013) had 30 participants including 67 % males and 33 % female. The participants ranged in age from 12 to 17 years old. Fifty eight percent of the participants were Caucasian, 25 % Hispanic, and 17% African American (Hughes et al., 2013). All of the participants had Major Depressive Disorder, however 44% only had MDD, while the remaining 56 % had comorbid diagnosis including Attention Deficit Hyperactivity Disorder and Anxiety Disorder (Hughes et al., 2013).

Hughes et al.(2013) found both the EXER and STRETCH groups demonstrated significant improvement in depressive symptom as evidenced by decreasing scores on the CDRS-R scale ($p=0.034$). However, the EXER group was noted to have a faster response when compared to the

control group (STRETCH) ($p=0.029$). There were no differences noted between genders. The EXER group reached an 86 % remission rate, while the STRETCH group's remission rate was 50% ($p=0.049$). The authors noted remission rates for each group were maintained at week 26 and 52 (Hughes et al., 2013).

The second study included in the systematic review was an Interventional Study that utilized convenience sampling. Six participant's motor activity was monitored for nine weeks. The CDRS-R was given to the participants prior to the initiation of the study and again at the end of the nine weeks (Finazzi et al., 2009). The study included six participants diagnosed with Major Depressive Disorder. The ages of the participants ranged from 14-17 years old. Four of the participants were females and two were males. There was no discussion of socioeconomic class or ethnicity (Finazzi et al., 2009). Finazzi et al. (2009) found there was a significant correlation between increased motor active and decreased (improved) scores on the CDRS-R ($p=0.005$). There was no documented difference between genders.

Both of the studies included in this systematic review reported statistically significant improvement of depressive symptoms when increased exercise/physical activity was introduced (Hughes et al., 2013; Finazzi et al., 2009). While vigorous activity yielded a greater improvement, it is important to note that there was statistically significant improvement in depressive symptom for adolescents with MDD who participated in low level activity such as stretching (Hughes et al., 2013). The positive effects of exercise/physical activity lasted up to 52 weeks after the interventions (Hughes et al., 2013).

After completing an exhaustive search of the literature there was very limited information specific to the effects of physical activity on depressive symptoms for adolescents with MDD. Only two research studies were identified. The two studies do have some limitations including

low sample size and study quality. However, it is important to note that based on these studies, exercise/physical activity has the potential to improve depressive symptoms in adolescents with a pre-established diagnosis of MDD. These studies demonstrated some level of improvement of depressive symptom with all levels of exercise. Given the increased risk of suicide for patients with MDD and the high number of adolescents who go untreated, it is important to explore all types of treatments. Increased exercise/physical activity may be an option for those who are concerned about stigma of psychotropic medications or have difficulty accessing care. While there is limited research, the current literature does support that there may be an improvement in depressive symptoms for adolescents with MDD by implementing an exercise program. This information is the basis of this DNP QI Project.

Rationale

This Pilot DNP QI Project utilized Social Cognitive Theory as its guiding theoretical framework. Social Cognitive Theory is based on the belief that learning and change occurs within a social context (Behavioral Change Models, 2018). Reciprocal Determinism, a major component of the Social Cognitive Theory, identifies the link between behavior, the person, and the environment (Bandura, 1977; Behavioral Change Models, 2018). See Appendix A. Behaviors are considered the actions taken by an individual, positive or negative, for example to participate in physical activity or not to participate in physical activity. The person includes cognitive, affective and biological events, such as past personal experiences, beliefs, and personality. The environment, does not just consider the physical environment, it includes social interactions and reinforcements. (Bandura, 1989; Behavioral Change Models, 2018). Each of these components has a major effect on one another, for successful behavior change, the behavior, person and environment must be considered. Other important constructs of Social Cognitive Theory include;

self-efficacy, behavioral capability, observational learning, reinforcements, and expectations (Bandura, 1988; Behavioral Change Models, 2018).

The constructs of Social Cognitive Theory were incorporated into this Pilot DNP QI Project. Behavioral capability was promoted through psychoeducation, pamphlets, and demonstration. The goal was that with increased knowledge, return demonstration and support, the participants would feel competent and capable to perform the exercises independently and participate in the physical activity group weekly, which would ultimately lead to decreased depressive symptom. Observational learning or modeling was also a key component of this group. By participating in each of the sessions, the leader acted as role model for the participants. Positive reinforcement for participation during the group and exercising independently was incorporated into the group activities. Participants were able to keep fitness equipment if they attend the group and participated, by offering fitness equipment the participants will have the necessary materials to exercise independently. In addition, there were weekly discussions about the positive outcomes the participants experienced from exercising. The goal of each intervention was to increase self-efficacy, which would ultimately assist with changing behavior.

Specific Aim

Adolescents with MDD are at a higher risk of suicide and may not seek treatment due to the stigma associated with some of the treatments. Physical activity has been found to improve depressive symptoms and may be a more acceptable treatment options for some patients. Currently, Lakes Region Mental Health offers a physical activity program for adults, however there is no program for adolescents. The purpose of this Pilot DNP QI Project was to determine if physical activity improves depressive symptom for adolescents with MDD as measured by the PHQ-9 for Adolescents Depression Screening. See Appendix B. The pre-intervention and post-

intervention data collected was compared to help identify if physical activity was effective in decreasing PHQ-9 for Adolescent Depression scores in adolescents participating in the physical activity group and if a physical activity group should be implemented for the adolescents on a permanent basis, as is currently offered for the adult patients at Lakes Region Mental Health Center.

Methods

Context

All patients at Lakes Region Mental Health ages 13-18 with a diagnosis of MDD and Unspecified Depressive Disorder who attended therapy were invited to participate in the physical activity group. Twenty-seven eligible participants were asked to join the group. Ten patients expressed interest, but due to a variety of reason including transportation, time of the group and conflicting responsibilities only four patients began the group. One participant only attended the first session. Ultimately the physical activity group was comprised of three adolescent females, ages thirteen, fourteen, and sixteen. Each of the participants had a diagnosis of Major Depressive Disorder and were receiving treatment at Lakes Region Mental Health.

Lakes Region Mental Health Center is located in Laconia, New Hampshire. The catchment includes towns from Belknap and Southern Grafton County. There are approximately three thousand clients served by this community mental center with offices in Laconia and Plymouth, NH (Lakes Region Mental Health, 2018). The populations served include children, adolescents, adults and older adults with mental health disorders, with approximately 511 children and adolescents receiving treatment. Services provided include outpatient medication management, individual and group therapy, exercise and nutritional programs, supportive employment, functional support services, integrated health, and emergency services (Lakes Region Mental

Health, 2018). In addition, providers from this center provide care to clients who are inpatient at the Geriatric Psychiatric Unit at Lakes Region General Hospital and a Designated Receiving Unit at Franklin Hospital (Lakes Region Mental Health, 2018).

Lakes Region Community Mental Health is a non-profit company that has a Board of Directors overseeing the organization. The Executive Director reports directly to the Board of Directors. The next level includes the Assistant Executive Director and Medical Director. The Clinical Services Director and Medical Staff Report Directly to the Medical Director. See Appendix C for more specifics about the organizational chart.

Intervention

This physical activity group met for one hour and thirty minutes once a week for eight weeks. Each weekly group meeting consisted of sixty minutes of physical activity and thirty minutes to discuss journal entries and information about safe effective exercise options.

According to the Centers for Disease Control and Prevention (CDC) children and adolescents should participate in sixty minutes or more of physical activity every day (CDC, 2018). The majority of the sixty minutes of activity should include moderate to vigorous aerobic exercise on most days. It is recommended by the CDC, vigorous exercise be done at least three days per week (CDC, 2018). Muscle-strengthening exercise should be done at least three days of the week as part of the hour of exercise. Bone-strengthening activities should be completed at least three days of the week (CDC, 2018).

Physical activities for the adolescent physical activity group were based on the recommendations from the CDC. According to the CDC, moderate and vigorous activity may include walking briskly, bicycling, jump rope, tennis, dancing, swimming, water aerobics, and gardening (CDC,2018). Muscle strengthening exercise may include tug of war, push-ups,

resistance exercises with bands, weight machines, hand-held weights, rock climbing, sit-ups and gymnastics. (CDC, 2018). Lastly bone strengthening exercises may include hopping, skipping, jumping, jumping rope, running, sports such as gymnastics, basketball, volleyball and tennis (CDC, 2018).

Table 1.

CDC Recommended Physical Activity for Adolescents

Type of Physical Activity	Frequency of Physical Activity	Examples of Physical Activity
Physical Activity	60 minutes or more of physical activity everyday	Aerobic, muscle strengthening and bone strengthening
Aerobic Exercise	Should be the majority of the 60 minutes of physical activity most days	Walking briskly, bicycling, jump rope, tennis, dancing, swimming, water aerobics, and gardening
Muscle Strengthening	Three days per week as part of the total 60 minutes of physical activity	Tug of war, push-ups, resistance exercises with bands, weight machines, hand-held weights, rock climbing, sit-ups and gymnastics

Bone Strengthening	Three days per week as part of the total 60 minutes of physical activity	Hopping, skipping, jumping, jumping rope, running, sports such as gymnastics, basketball, volleyball and tennis
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Activities from each of these recommend groups were incorporated in the physical activity group. Physical activity completed by the group included yoga, balance and strengthening, bar class, water aerobics, karate and dancing. See Appendix D for a detailed scheduled. There was a total of four different instructors that led the physical activity portion of the group. The discussion portion was led by the APRN conducting the project.

Each participant was encouraged to participate in physical activity during the week. The participants were given journals and asked to track the amount and type of physical activity performed daily. During the 30 minutes of discussion, the journals were discussed and information about safe effective exercise options was addressed. Lastly, participants were provided healthy snacks and a few minutes to socialize.

Study of the Interventions

The PHQ-9 for Adolescents was utilized to measure depressive symptoms. The PHQ-9 for Adolescents Depression Screening was completed before participants started the physical group and the week after the group completed. This is a nine-question survey (Appendix B). The PHQ-9 has been studied extensively and is frequently used to assess for depression. A study by Richardson, McCauley, Grossman, McCarty, Richards, Russo, Rockhill, & Katon (2010) found that when an adolescent had a score of greater than eleven on PHQ-9 there was sensitivity of

89.5% and a specificity of 77.5 % for detecting MDD. The conclusion of the researchers in this study was that the PHQ-9 for adolescents held much promise and was considered a good depression screening for adolescents (Richardson et al., 2010).

The population included for this pilot quality improvement project were adolescents ages 13-16. The PHQ-9 for adolescents was adapted from the PHQ-9 specifically for this age group. This tool was chosen because it has been shown to be a valid tool for measuring depression. In addition, the providers at Lakes Region Mental Health frequently utilize the PHQ-9 for Adolescents Depression Scale, therefore participants of the physical activity group were familiar and comfortable completing the PHQ-9 for Adolescents Depression Screening tool. The PHQ-9 for Adolescents Tool was chosen over the CDRS-R because the adolescents were familiar with the tool and the PHQ-9 has been shown to be a valid tool for measuring depression in Adolescents (Richardson et al., 2010).

Measures

Quantitative data was collected in the form of the PHQ-9 for Adolescent Depression Screening. This information was collected on individual group participants pre-intervention and post-intervention. Quantitative and Qualitative data was collected via a written survey. The survey utilized a 5-point Likert Scale and open text boxes for open comments (Appendix E).

Analysis

The pre-intervention and post-intervention PHQ-9 for Adolescents Depression Screening results were analyzed for change in depressive symptoms. In addition, surveys were reviewed. Trends, patterns, and themes regarding the impact physical activity had on participants' lives and MDD were noted. This information was important in determining if the physical activity group decreased depressive symptoms in adolescents with MDD.

Ethical Consideration

An Application for Nursing Clinical Project Review was submitted to the University Of New Hampshire Department of Nursing Quality Review Committee. The committee determined the University of New Hampshire Internal Review Board (IRB) must approve this project prior to implementation of this project. University of New Hampshire (UNH) Internal Review Board (IRB) application was submitted. After review from the Internal Review Board it was determined this project was quality improvement and not research, therefore IRB approval was not required. There is no required IRB process at Lakes Region Mental Health.

Due to the age of the participants a consent was signed by the participants' parents or guardians and the participants signed a consent that they agreed to participate. No participant was forced to participate. See Appendix F.

Participants were protected by the Health Insurance Portability and Accountability Act. This act includes a number of privacy protections, including protection of health care information (US Department of Health & Human Services, 2018). Patient identifiers were removed and all protected health information was seen only by authorized persons. Data was stored on a computer with no access to the internet and password protection. Any paper data was double locked in a file cabinet.

Results

In order to initiate this Pilot DNP QI Project a timeline with specific activities was developed during the proposal stage. Each of the activities were completed, however it took longer than expected and project was delayed by two months. There were two major factors that contributed to the delay. The first was the length of time needed to receive recommendations from University of New Hampshire Department of Nursing Quality Review Committee and University of New

Hampshire (UNH) Internal Review Board. The second cause for the extended timeline was related to the recruitment of participants. See Appendix G for specific dates of expected and actual completion of each activity.

Initially there were four participants enrolled, however one of the participants did not return after the first group. Of the remaining three participants: participant #1 attended all eight sessions; participant # 2 attended six of the eight sessions; and participant # 3 attended seven out of the eight session.

The pre-intervention and post-intervention PHQ-9 for Adolescents scores were analyzed. At the pre-intervention the participants' PHQ-9 scores were obtained. Participant #1 scored an eleven indicating moderate severity of depression. Participant # 2 scored sixteen, moderately severe depression and participant # 3 scored seventeen, moderately severe depression.

Table 2.

Pre and Post Intervention PHQ-9 for Adolescent Scores

Participant	Pre-Intervention		Post-Intervention	
	Score	Severity of Depression	Score	Severity of Depression
1	11	Moderate	5	Mild
2	17	Moderately Severe	13	Moderate
3	16	Moderately Severe	21	Severe

The results of the post intervention PHQ-9 for Adolescents indicate there was improvement of depressive symptoms for two out the three participants. See Table 2. Participant #1 was noted to have had the most significant decrease in depressive symptoms. Her PHQ-9 for Adolescents decreased by 6 points, from 11 to 5, reducing her depression severity to mild depression from moderate depression. It is important to note that she was the only participant who attended all eight session. Participant # 2 decreased from moderately severe to moderate depression with her score dropping 4 points from 17 to 13 points. Lastly, Participant #3 reported an increase in depression symptoms. Participant #3 did report improvement with appetite and energy, however she scored worse in regards to “feeling like you have let your family down” and “thoughts to hurt herself” (PHQ, 2018). One major contributing factor to these results, may have been that a close family member was hospitalized due to a serious chronic illness. This occurred in the last few weeks of the group.

At week four and upon completion of the group a written survey (See Appendix E) was completed by the three participants. The survey collected quantitative information regarding the participants’ perception of the effect that exercise had on their depressive symptoms as outlined in the DSM-5. This written survey offered the participants an opportunity to express their thoughts about the physical activity group.

Themes identified at week four included each of the participants agreeing or strongly agreeing that they enjoyed exercising. Two of the three participants believed they were interacting more with others since starting to exercise. One participant strongly agreed her motivation improved while the other two felt neutral about their motivation as it related to exercise. One participant agreed her sleep and energy improved with the addition of exercise. According to the survey at

week four there was no improvement noted in regards to self-esteem, anhedonia, or concentration. Two of the three participants completed the open comment section at the four weeks. One participant stated “I feel better emotionally because I can be active with other people.” A second participant reported, “I have come to group in a bad mood, but left feeling much better.

The written survey was administered upon completion of the physical activity group. Areas that continued to improve for two out of the three included overall feelings of depression, interaction with others, being happier with themselves, and enjoying exercise. Participant # 3 was neutral or slightly worse on all areas. See Table 3.

Table 3.

Comparison of Week 4 and Week 8 Impact of Physical Activity Group Survey

	Participant #1	Participant #2	Participant #3
1. Exercising has improved my depression	+1	+1	no change
2. I have enjoyed exercising	-1	+1	no change
3. I have been interacting with others more since I started exercising	+1	+3	-2
4. I have been more motivated since I started exercising	+1	-2	-1
5. I have been sleeping better since I started exercising	-1	+1	no change
6. I am happier with myself since I started exercising	+1	+1	no change

7. I have more energy since I started exercising	no change	no change	-1
8. I am enjoying things more since I started exercising	+2	+1	no change
9. I can concentrate more since I started exercising	+1	+3	no change

* Increased score indicated improvement in depressive symptoms

Participants were asked to write any thoughts they wanted to share about the physical activity group. All three participants were noted to be more detailed with their written comments at the week eight survey as compared to the week four survey. There were three themes identified after analyzing the qualitative data. The first theme identified was improved depression. Two out of three participants reported improvement of depression in all settings. Participant #3 reported that she experienced improved depressive symptoms while at the group. She stated “I’ve felt better while I am here at the group.” Other quotes included, “When I come to the group I can leave all my worries at the door” and “It helped me with my depression.”

The physical activity group yielded two unexpected benefits. Increased self-esteem was the second theme discovered. Each of the participants discussed traits of improved self-esteem, including that it was “fun to laugh at ourselves as we learned new things.” Other comments that reflected improved self-esteem included; “this group made me feel better about myself” and “I felt support from my peers.” Increased self-esteem and self-efficacy can improve coping in multiple settings (Bandura, 1977). Self-efficacy can be increased through performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal (Bandura, 1977). Each of these sources were included in the physical activity group. Participants reported

feeling accomplished after completing a new activity. Live modeling was an important part of the group, the leader participated in each of the activities. If an activity became taxing, the leader utilized relaxation and verbal persuasion. This allowed the participant to be successful and complete the task which increased self-efficacy. According to Bandura's Social Cognitive Theory (1977), once self-efficacy is established it can be translated to other settings.

Increased socialization and "making new friends", was addressed by each of the participants on the written survey. This third theme was easily identified as the comments were analyzed. Participant #3 commented that "I made new friends and it was nice to be around others who are going through the same thing." Another participant stated "I made new friends, I need those." The last participant reported, "I've become more sociable and made new friends."

Participants were asked to keep a journal of the amount and type of physical activity they completed on their own time. All participants reported engaging in one to two hours of physical activity per week. This was in addition to the one hour of physical activity they completed at the physical activity group. Walking was the most common type of physical activity completed on their own time. Participant # 2 reported doing yoga two times over the eight weeks. Participant # 3 reported the group inspired her to join soccer during week seven of the physical activity group.

Discussion

Summary

All three participants reported positive benefits from the physical activity group. Comments from the participants identified improved depression, self-esteem and social contacts. Two of the three participants demonstrated an improvement with depressive symptom as evidenced by a decreased score on the post intervention PHQ-9 for Adolescents. Although the third participant

identified that physical activity improved her depression when at the group and inspired her to join a soccer team, her PHQ-9 for Adolescents increased, indicating worsening of depressive symptoms. It is important to note this participant revealed she had been suffering from significant life stressors that were effecting her mood. She had a family member hospitalized for a serious chronic illness.

A key strength of this group was that each of the participants requested the physical activity group be continued. All three participants volunteered to work on a proposal to present to the Child and Adolescent Team at Lakes Region Mental Health Center to continue offering the physical activity group. Their intention with this proposal was to share how the group impacted their depression and to request the physical activity group be continued.

Interpretation

Findings from this Pilot DNP QI study were consistent with the literature. Hughes et al. (2013) and Finnazi et al. (2009) both found improved depressive symptoms for adolescents that participated in a physical activity program. Hughes et al. (2013) discovered that there was a benefit from both vigorous and low impact exercise. During this pilot study the participants engaged in a variety of physical activity ranging from low to moderate levels of activity. While this pilot study had a small sample, the majority of the participants had a decrease in depressive symptoms as evidenced by their PHQ-9 for adolescents. It appeared that attending a physical activity group consistently may yield better outcomes, as the participant who attended every physical activity group had the most robust response when compared to those who missed one or two sessions.

In addition to the quantitative findings, the qualitative findings were also consistent with the literature. Improved self-esteem and increased social contacts were noted to be unexpected

benefits of this pilot study reported by all three participants. This could be related to the peer relationships the participants developed. The literature shows that peer relationships have a direct relationship to depression in adolescents. Lack of peer relationships were found to be a positive predictor of depression in adolescents (Bosacki, Danea, Marinia, & Cura, 2007). This study reported that depression was associated with social alienation. The researchers found that friendship reduced depressive symptoms, while social isolation was related to increased depression. (Bosacki, et al., 2007). Spithoven, Lodder, Goossens, Bijttebier, Bastin, Verhagen, & Scholte (2017) separated adolescents into groups based on the severity of their depression symptom and loneliness. They found that adolescents with a higher severity of depression reported lower quality of friendships and higher levels of loneliness, when compared with adolescents who reported a lower severity of depression (Spithoven et. al, 2017).

The correlation between self-esteem and depression in adolescents has been demonstrated in previous studies. Spithoven et al. (2017) found that adolescents with a higher severity of depression demonstrated lower levels of self-esteem. Bosacki et al. (2007), discovered a similar finding, self-esteem in adolescents was significantly related to depression. Specifically, adolescents with poor self-esteem may have an increase vulnerability to depression (Bosacki et al., 2017). Low self-esteem in adolescents may have long lasting effects. Steiger, Fend, & Allemand (2015) found that low self-esteem during adolescence was related to increased depressive symptom in adults at age 45.

Limitation

There were several limitations to this Pilot Doctorate of Nursing Process Quality Improvement Project. The small sample size was a major limitation of the project. While there was much time spent on recruitment only three participants committed to the group. Twenty-

seven eligible participants were asked to join the group. Several reoccurring themes for unwillingness to participate were identified. Transportation to the agency was identified as a barrier. Conflicting activities, such as school events or homework, were common reasons cited for not joining the physical activity group. Lastly, several potential candidates reported they were uncomfortable being in a group setting. In order to increase the number of participants, different times and locations were offered to potential participants however it did not result in increased participation.

Each of the participants were Caucasian females. The majority of the patients at Lakes Region Mental Health Center are Caucasian so the lack of heterogeneity represented the patient population. There were no males in the group which may limit the generalizability to the population of Lake Region Mental Health. The Children and Adolescents Division is comprised of 57% females and 43% males.

There are confounding variables that must be considered when analyzing the results of this project. It was clear the participants began to bond and become friends. They exchanged social media accounts and phone numbers. Given the connections made, it is possible the social interaction may have contributed to improved scores on the PHQ-9 for Adolescents and positive data. There was no control for social interaction. An additional variable to consider was related medication management. No data was collected on medication treatment or changes that may have been initiated during the physical activity group. .

Conclusion

The results of this Pilot DNP Quality Improvement Project indicated that implementing a permanent physical activity group for adolescents with MDD may help decrease depressive symptom. There is limited information in the literature that is specific to physical activity and

depressive symptoms for adolescents suffering from Major Depressive Disorder. The literature that is available has indicated a positive correlation with vigorous and low impact physical activity and a decrease in depressive symptoms (Hughes et al., 2013; Finazzi, et al., 2009). This pilot study demonstrated that all three participants reported improvement with depressive symptoms in at least one area, increased self-esteem and increased social contacts. Additionally, two out of the three participants had a decreased score on their PHQ-9 for Adolescents, from the beginning of the intervention compared to the end of the intervention indicating decreased depression. Further research with larger and more diverse populations is needed to confirm the findings of the few studies available.

Many of the interventions for Major Depressive Disorder are known to cause physical side effects and can be stigmatizing. An intervention, such as a physical activity group, that is more socially acceptable offers hope for those suffering from Major Depressive Disorder. Physical activity groups could be an important intervention that may increase adherence in treatment for adolescents suffering from Major Depressive Disorder, which may improve depressive symptoms.

The participants of the physical activity group developed a proposal to request the physical activity group be continued. Two of the three participants reported improved depressive symptoms in all aspects of their life, while one participant reported improved depressive symptoms while at the physical activity group. All three participants reported improved self-esteem and increased social contacts. These results, along with a drive to continue the physical activity group demonstrated this physical activity group had an impact on the three participants. Efforts should be made to continue the physical activity group for adolescents with MDD at Lakes Region Mental Health.

References

- American Association on Suicidality. (2014). Depression and Suicide Risk, retrieved March 9, 2018 from <https://www.suicidology.org/portals/14/docs/resources/factsheets/2011/depressionsuicide2014.pdf>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Bandura, A. (1988). Organizational applications of social cognitive theory. *Australian Journal of Management*, 13, 275-302
- Bandura, A. (1989). Social cognitive theory. *Annals of child development*. JAI Press Greenwich, CT.
- Behavioral Change Models. (2018). Social Cognitive Theory, Retrieved from: <http://sphweb.bumc.bu.edu/otlt/MPH/Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories5.html>
- Bosacki, S., Danea, A., Marinia, Z., & Cura, Y. (2007). Peer relationships and internalizing problems in adolescents: mediating role of self-esteem. *Emotional & Behavioural Difficulties*, 12(4), 261-282
- CDC. (2018), Measuring Physical Activity. Retrieved from: <https://www.cdc.gov/physicalactivity/basics/measuring/>
- CDC. (2018). Needs for Children, Retrieved from : https://www.cdc.gov/physicalactivity/basics/children/what_counts.htm
- CDC. (2018). 2008 Physical Activity Guidelines for Americans. Retrieved from: <https://health.gov/paguidelines/pdf/paguide.pdf>
- Finazzi M.E, Mesquita, M.E., Lopes, J.R., Fu. L., & Oliveira, M.G. (2009). Motor activity and

Depression severity in adolescent outpatients. *Neuropsychobiology*, 61, 33-40.

Hughes, C.W., Barnes, S., Barnes, C., DeFina, L.F., Nakonezny, P., & Graham, E.J. (2013).

Depressed adolescents treated with exercise (DATE): A pilot randomized controlled trial to test feasibility and establish preliminary effect size. *Mental Health Physical Activity*, 6(2), 1-32.

Lakes Region Mental Health. (2018). About Us. Retrieved from: <https://www.lrmhc.org/>

National Institute of Mental Health. (2018). Prevalence of Major Depressive Episode Among Adolescents, retrieved March 8, 2018 from

https://www.nimh.nih.gov/health/statistics/major-depression.shtml#part_155031

Sadock, B.J., Sadock, V.A. & Ruiz, P. (2015). *Synopsis of Psychiatry*, (11th ed.). Philadelphia, Pennsylvania: Wolters Kluwer.

Spithoven, A., Lodder, G., Goossens, L., Bijttebier, P., Bastin, M., Verhagen, M., & Scholte, R. (2017). Adolescents' loneliness and depression associated with friendship experiences and well-being: A person-centered approach. *Journal of Youth Adolescence* 46, 429–441.

Steiger, A., Fend, H., & Allemand, M., (2015). Testing the vulnerability and scar models of self-esteem and depressive symptoms from adolescence to middle adulthood and across generations. *Developmental Psychology*, 51(2), 236–247.

Patient Health Questionnaire (PHQ) Screeners (2018). Screener Overview, Retrieved from: <http://www.phqscreeners.com/>

Richardson, L., McCauley, E., Grossman, D., McCarty, C., Richards, J., Russo, J.,

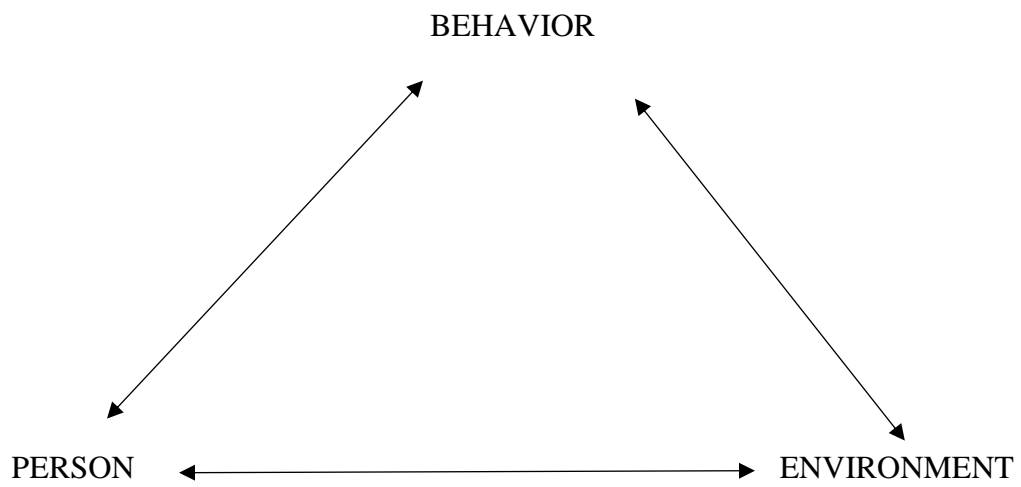
Rockhill, C., & Katon, W. (2010). Evaluation of the Patient Health Questionnaire (PHQ-9) for detecting Major Depression among adolescents. *Pediatrics*, 126(6), 1117–1123.

US Department of Health & Human Services. (2018). Health Information Privacy. Retrieved

from: <https://www.hhs.gov/hipaa/for-professionals/privacy/laws-regulations/index.htm>

Appendix A

Reciprocal Determinism



(Bandura, 1977, 1988, 1989)

Appendix B

PHQ-9 for Adolescent Screening

Severity Measure for Depression—Child Age 11–17*

*PHQ-9 modified for Adolescents (PHQ-A)—Adapted

Name: _____ Age: _____ Sex: Male Female

Date: _____

Instructions: How often have you been bothered by each of the following symptoms during the past 7 days?

Clinician Use Item score:

(0) Not at all (1) Several days (2) More than half the days (3) Nearly every day

1. Feeling down, depressed, irritable, or hopeless?
2. Little interest or pleasure in doing things?
3. Trouble falling asleep, staying asleep, or sleeping too much?
4. Poor appetite, weight loss, or overeating?
5. Feeling tired, or having little energy?
6. Feeling bad about yourself—or feeling that you are a failure, or that you have let yourself or your family down?
7. Trouble concentrating on things like school work, reading, or watching TV?
8. Moving or speaking so slowly that other people could have noticed?

Or the opposite—being so fidgety or restless that you were moving around a lot more than usual?

9. Thoughts that you would be better off dead, or of hurting yourself in some way?

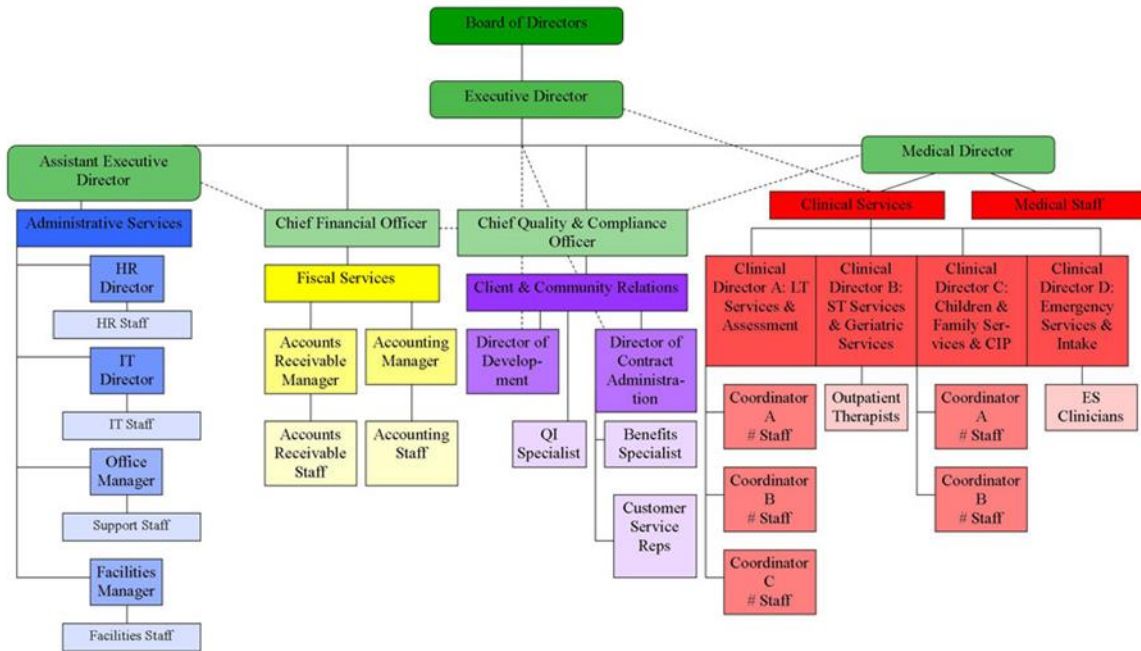
(Patient Health Questionnaire (PHQ) Screeners, 2018)

Interpretation Table of Total Raw Score

Total Raw Score	Severity of depressive disorder or episode
0-4	None
5-9	Mild
10-14	Moderate
15-19	Moderately severe
20-27	Severe

(Patient Health Questionnaire (PHQ) Screeners, 2018)

Appendix C
Organizational Chart



Appendix D

Physical Activity Group Schedule

Date	Time	Place	Physical Activity
Monday September 17, 2018	500 PM to 630 PM	Lakes Region Mental Health Center (LRMHC)	Yoga/Dance with Nancy
Tuesday September 25, 2018	500 PM to 630 PM	LRMHC	Yoga, Karate with Russ
Monday October 1, 2018	500 PM to 630 PM	LRMHC	Strength and Condition Class With Lyndsey
Monday October 8, 2018	500 PM to 630 PM	LRMHC	Bar Class With Lyndsey
Monday October 15, 2018	500 PM to 630 PM	LRMHC	Pound Class With Lyndsey
Monday October 22, 2018	500 PM to 630 PM	LRMHC	Water Aerobics With Tammy
Monday October 29, 2018	500 PM to 630 PM	Taylor Home	Yoga, Karate with Russ
Monday November 5, 2018	500 PM to 630 PM	LRMHC	Yoga/Dance with Nancy

Appendix E

Impact of Physical Activity Group Survey

1.	Exercising has improved my depression	1	2	3	4	5
2.	I have enjoyed exercising	1	2	3	4	5
3.	I have been interacting with others more since I started exercising	1	2	3	4	5
4.	I have been more motivated since I started exercising	1	2	3	4	5
5.	I have been sleeping better since I started exercising	1	2	3	4	5
6.	I am happier with myself since I started exercising	1	2	3	4	5
7.	I have more energy since I started exercising	1	2	3	4	5
8.	I am enjoying things more since I started exercising	1	2	3	4	5
9.	I can concentrate more since I started exercising	1	2	3	4	5

10. Please write in any thoughts you would to share about how you feel since joining the exercise group. This may be how you feel physically or emotionally. You also may include any other information about how the exercise has affected your life.

11. I feel depressed:

Everyday	4-6 days a week	2-4 days a week	1-2 days a week	0 days a week
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Key:

1= Strongly Disagree, 2= Disagree, 3=Neutral, 4=Agree, 5 = Strongly Agree
 All your responses are confidential and anonymous.

Appendix F

Consent

CONSENT FORM FOR PARTICIPATING IN A QUALITY IMPROVEMENT PROJECT**PROJECT MANAGER AND TITLE OF PROJECT**

My name is Nancy Gallagher and I am Psychiatric Nurse Practitioner pursuing a Doctorate of Nursing Practice Degree at the University of New Hampshire. Part of my degree requires me to conduct a Quality Improvement Project. My Quality Improvement Project is entitled: The Effect of Physical Activity on Depressive Symptom for Adolescents with Major Depressive Disorder

WHAT IS THE PURPOSE OF THIS FORM?

This consent form describes the Quality Improvement Project and helps you to decide if you want to participate. It provides important information about what you will be asked to do in the project, about the risks and benefits of participating in the project, and about your rights as a participant. You should:

- Read the information in this document carefully, and ask me or the Melissa McGee in UNH Research Integrity Services, 603/862-2005 research personnel any questions, particularly if you do not understand something
- Not agree to participate until all your questions have been answered, or until you are sure that you want to.
- Understand that your participation in this project involves you to attend a weekly physical activity group for 8 weeks, complete a depression screening at the beginning and end of the physical activity group, complete an online survey at week 4 and at the end of the physical activity group. The group is 1.5 hour per hours each week. The surveys and depression screening will take approximately 10 minutes.
- Understand that the potential risks of participating in this project are minor muscle aches or other minor physical issues that would be associated with exercise.

WHAT IS THE PURPOSE OF THIS PROJECT

The purpose of this Quality Improvement Project is to identify if physical activity improves depression in adolescents with Major Depressive Disorder. It is estimated there will be 10 adolescents in the physical activity group.

WHAT DOES YOUR PARTICIPATION IN THIS PROJECT INVOLVE?

You will attend a weekly physical activity group. This group will meet for 8 weeks and will be 1.5 hours long. During the group you will participate in physical activity for 60 minutes and have group discussion for 30 minutes. You will complete a depression rating scale before the group begins and upon completion of the group. There will also be two online surveys that you will be asked to fill out. Lastly, you will be asked to keep of journal of any physical activity that you engage in outside of the group.

WHAT ARE THE POSSIBLE RISKS OF PARTICIPATING IN THIS PROJECT?

There is minimal risk of physical injury from the physical activity.

WHAT HAPPENS IF YOU GET SICK OR HURT FROM TAKING PART IN THIS PROJECT?

If you are injured or require medical treatment, you may seek treatment from your primary care provider or, if eligible, from UNH Health & Wellness. The University of New Hampshire, the Project Manager or Lakes Region Mental Health Center are not responsible for the cost of any care required as a result of your participation in this project.

WHAT ARE THE POSSIBLE BENEFITS OF PARTICIPATING IN THIS PROJECT?

Possible benefits include improved mood and physical health.

IF YOU CHOOSE TO PARTICIPATE IN THIS PROJECT, WILL IT COST YOU ANYTHING?

There are no costs for the participants of this physical activity group.

WILL YOU RECEIVE ANY COMPENSATION FOR PARTICIPATING IN THIS PROJECT?

You will not receive any compensation for participating in this group

DO YOU HAVE TO TAKE PART IN THIS PROJECT?

Taking part in this project is completely voluntary. You may choose not to take part at all. If you agree to participate, you may refuse to answer any question. If you decide not to participate, you will not be penalized or lose any benefits for which you would otherwise qualify.

CAN YOU WITHDRAW FROM THIS PROJECT?

If you agree to participate in this project and you then change your mind, you may stop participating at any time. Any data collected as part of your participation will remain part of the project records. If you decide to stop participating at any time, you will not be penalized or lose any benefits for which you would otherwise qualify.

HOW WILL THE CONFIDENTIALITY OF YOUR RECORDS BE PROTECTED?

I plan to maintain the confidentiality of all data and records associated with your participation in this project. All information will be anonymous and there will be no any identifiable information.

Please note the online survey via the internet poses minimal risk of a breach of confidentiality.

To help protect the confidentiality of your information, all information will be anonymous and have no patient identifiers. Data will be double locked in a filing cabinet and only be accessible to Nancy Gallagher and her faculty advisor, Dr. Dayle Sharp. Results will be reported to Lakes Region Mental Health Center and faculty at University of New Hampshire. The results may be used in reports, presentations, and publications, where results will be reported as a group.

WHOM TO CONTACT IF YOU HAVE QUESTIONS ABOUT THIS PROJECT

If you have any questions pertaining to the project you can contact Nancy Gallagher at 524-1100.

If you have questions about your rights as a participant you can contact Melissa McGee in UNH Research Integrity Services, 603/862-2005 or melissa.mcgee@unh.edu to discuss them.

PARTICIPANT:

Yes, I, _____ consent/agree to participate in this project.

No, I, _____ do not consent/agree to participate in this project.

Signature

Date

PARENT/GUARDIAN:

Yes, I, _____ consent/agree to allow my child to participate in this project.

No, I, _____ do not consent/agree to allow my child participate in this project.

Signature

Appendix G

Timeline

E= Expected Date

A= Actual Date

Activity to Complete	April/ May	June	July	August	September	October	November	December
Submit DNP Proposal	E= 5/28/18	A= 6/4/18						
Submit IRB and or Nursing Quality Review Committee (NQRC) Application	E= 5/29/18 A= 4/23/18 NQRC A= 5/30/18 IRB							
IRB or Nursing Quality Review Committee Approval/	A= 5/7/18 (must go to IRB)	E= 6/15/18	A= 7/25/18					

Direction Received								
DNP Proposal Approved		E= 6/8/18 A= 6/11/18						
Begin Recruitment of Participants		E= 6/16/18	A= 7/30/18					
Participants confirmed and consents signed		E= 6/22/18			A= 9/14/18			
PHQ-9 for Adolescents administered		E= 6/25/18			A= 9/14/18			
Exercise Groups Begin		E= 6/29/18			A= 9/17/18			

Exercise Group Continue			E=All of July, 2018		A= 9/17/18 9/25/18	A= 10/1/18 10/8/18 10/15/18 10/22/18 10/29/18	A= 11/5/18	
Last Day of Exercise Group				E= 8/31			A= 11/5/18	
PHQ-9 for Adolescents administered					E=9/1 - 9/14		A= 11/6- 11/9/18	
PHQ-9 for Adolescents results analyzed					E= 9/14- 9/24/18		A= 11/10/18	
Begin interpretation of results					E= 9/24/18		A= 11/11/18	
Complete interpretation of results						E= 10/8/18	A= 11/16/18	

Begin DNP project						E= 10/8/18 A= 10/6/18		
Complete write up of DNP Project							E= 11/16/18 A= 11/23/18	
Presents Results to Lakes Region Mental Health							E= 11/29/18	A= !2/7/18
Present DNP Project to Faculty at UNH								E/A= 12/14/18