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Running Head: INDEPENDENT STUDY PROJECT

Independent Study Project: The Use of Exercise in Treating Depression

Katelin Umland

A project submitted for fulfillment of Nursing 997

College of Nursing and Professional Disciplines

University of North Dakota

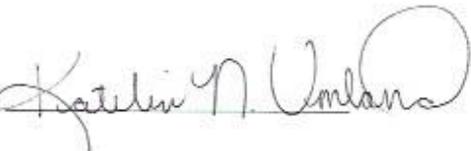
Summer 2016

PERMISSION

Title The Use of Exercise in Treating Depression
Department Nursing
Degree Master of Science

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Abstract

Depression is one of the most common mental illnesses resulting in mortality, morbidity, lowered income, and unemployment. Depression is usually treated with the golden standard of psychotherapy and psychopharmacology. There has been a recent interest in discovering complementary and alternative methods of disease management to help avoid medication side effects, decrease symptoms and improve overall health. This sparked interest in exploring exercise as a treatment modality for depressive symptoms as it has positive physical and mental health benefits.

The purpose of this project is to review the literature to determine what part exercise plays in treatment. The literature was explored to determine whether utilizing exercise alone can provide depressive symptom relief or if the use as adjunctive therapy to medication or psychotherapy yields stronger results than medication and psychotherapy alone. The literature was searched with the goal of examining effects of different types of exercise and how exercise affects different populations. A literature search via the Harley French library through Cochrane, CINAHL, and PsycINFO was completed along with using Neuman's Systems Model as a theoretical framework for the project.

From the literature review, adults with a depressive disorder can have a reduction of their depressive symptoms after implementation of an exercise program as adjunctive therapy with psychopharmacology vs. no exercise program. This creates an impact on psychiatric nursing care for improved patient outcomes.

Independent Study Project: The Use of Exercise in Treating Depression

Introduction

Depression is one of the most common mental illnesses affecting over 100 million people worldwide causing morbidity and mortality (Cooney et al., 2013). Depression increases the risk of decreased workplace productivity and absenteeism resulting in lowered income or unemployment. The World Health Organization projections for the year 2030 include major depression as the leading cause of disease burden (Knapen, Vancampfort, Morien & Marchal, 2015). People with depression are at a higher risk of physical health complications in comparison to those who do not have a mental illness (Stanton & Happell, 2013).

Depression is usually treated with the golden standard of psychotherapy and psychopharmacology. There has been a recent interest in discovering complementary and alternative methods of disease management to help avoid medication side effects and improve overall health. Exercise may help improve depression symptoms. There is a wide range of biochemical and physiological changes and adaptations that occur during acute bouts of exercise and regular exercise training (Wolff et al., 2011). This paper searched the literature to determine if implementing an exercise program compared with no exercise program results in a reduction of depressive symptoms.

Purpose

The purpose of this project is to review the literature to determine what part exercise plays in treatment. The literature was explored to determine whether utilizing exercise alone can provide depressive symptom relief or if the use as adjunctive therapy to medication or psychotherapy yields stronger results than medication and psychotherapy alone.

The literature was searched with the goal of examining effects of different types of exercise and how exercise affects different populations. Different types of exercise were explored including aerobic, anaerobic, tai chi, and dance movement therapy to determine if different methods yield different results in treating depressive symptoms. Varying age groups of children/adolescents, adults, and elderly were evaluated to determine if exercise therapy is more effective in a certain population versus another.

Significance

Although research has shown psychopharmacology and psychotherapy effective in treating depression, there has been recent interest in alternative treatments (Cooney et al., 2013). This could be due to personal preference, overall health benefits, financial considerations, or medication side effects. With the negative stigma for mental health treatment, some people are not willing to engage in medication or psychotherapy. Exercise with its known mental health benefits (Cooney et al., 2013), may provide symptom relief for people who may choose not to take antidepressant medications or engage in psychotherapy.

Exercise has shown physical and mental health benefits, spiking an interest in its use with depression. There are many different theoretical reasons why exercise may improve depression (Cooney et al., 2013). Enhancement of the synthesis and liberation of neurotrophic factors,

cognitive functioning, angiogenesis, neurogenesis, and plasticity are all hypothesized mechanisms (Knapen et al., 2015).

People with depression are at a higher risk of physical health complications in comparison to those who do not have a mental illness. Utilizing exercise as a treatment modality may not only decrease depressive symptoms, but may also increase the mortality and morbidity rates (Stanton & Happell, 2013).

Theoretical Framework

Betty Neuman's Systems Model is used to guide the framework for this paper. Neuman's model utilizes a systems approach focused on the human needs of protection or relief from stress. Neuman believed that the causations of stressors can be identified and given relief via nursing interventions, the nurse can provide through identification of problems, mutually agree on goals, and use the concept of prevention as intervention (McEwen & Wills, 2014).

Neuman defines human beings as a client/client system, as a composite of physiological, psychological, sociocultural, developmental, and spiritual. Environment is defined as a structure of concentric rings representing the three environments of internal, external, and created environments which all influence the client's adaptation to stressors. Health is defined as a continuum, wellness and illnesses are at opposite ends, health for the client is equated with optimal system stability that is the best possible wellness state at any given time. In nursing, the major concern is to maintain client system stability through accurately assessing environmental and other stressors and assisting in client adjustments to maintain optimal wellness (McEwen & Wills, 2014).

Neuman defines the five interacting variables of physiological, psychological, sociocultural, developmental, and spiritual. These variables work to attain, maintain, or retain

system stability. The model is based on the client's reaction to stress as it maintains boundaries to protect the client's stability (McEwen & Wills, 2014).

Neuman has 10 assumptions of the model. Each client system is unique, a composite of factors and characteristics within a given range of responses; many known, unknown, and universal stressors exist. Each client/client system has evolved a normal range of responses to the environment that is referred to as a normal line of defense. When the flexible line of defense is no longer capable of protecting the client/client system against an environmental stressor, the stressor breaks through the normal line of defense. The client is a dynamic composite of the interrelationships of the variables, implicit within each client system are internal resistance factors known as lines of resistance, which function to stabilize and realign the client to the usual wellness state (McEwen & Wills, 2014).

Neuman discusses primary, secondary, and tertiary prevention. Primary prevention relates to general knowledge that is applied in client assessment and intervention, in identification, and in reduction of mitigation of possible or actual risk factors associated with environmental stressors to prevent possible reaction. Secondary prevention relates to symptomatology following a reaction to stressors, appropriate ranking of intervention priorities, and treatment to reduce their noxious effects. Tertiary prevention relates to the adjustive processes taking place as reconstitution begins and maintenance factors move the client back in a circular manner toward primary prevention; the client as a system is in dynamic, constant energy exchange with the environment (McEwen & Wills, 2014).

The physiological, psychological, sociocultural, developmental, and spiritual variables Neuman lists are all very important parts of the individual that play a role in depression. The line of defense can be broken down by a malfunction in any of these defenses, resulting in depressive

symptoms. Both the external and internal environments influence the client's adaptation ability to different stressors in life (McEwen & Wills, 2014).

Neuman's model is applied to the issue of treating depression with exercise therapy. The focus of depression is on human needs of protection or relief from stress. Depression is identified and relief obtained via nursing interventions such as different types of exercise therapy. The model is used to guide primary prevention of depression or prevention of a relapse, secondary prevention during mild depressive symptoms, or as tertiary prevention during a major depressive episode.

Definitions

The population involved are individuals of any age group or sex diagnosed with any type of depressive disorder. Depressive disorders include disruptive mood dysregulation disorder, major depressive disorder, dysthymia, premenstrual dysphoric disorder, substance/medication-induced depressive disorder, depressive disorder due to another medical condition, other specified depressive disorder, and unspecified depressive disorder (Diagnostic and Statistical Manual of Mental Disorders, 2013).

The intervention of exercise refers to any type of physical activity whether that be aerobic or non-aerobic. Types of exercise may include walking exercise, weights training, mixed cardiovascular, walking, cycling, and jogging. It may also include lower intensity exercises such yoga, tai chi, and dance movement therapy. Amount and duration of exercise are variable factors that need to be determined on an individual basis.

Process

A literature search was conducted through the University of North Dakota Harley French Library to discover available articles about exercise in treating depression. The Cochrane database was searched along with CINAHL and PsycINFO.

First, the Cochrane database was searched utilizing the keywords *depression* and *exercise*. This yielded 190 results, most not being pertinent to depression and exercise. Only three systematic reviews were found and utilized on the topic of exercise and depression. Other combinations were trialed such as *exercise therapy*, *depressive disorders*, and *major depressive disorder*. No further articles were found.

Second, CINAHL was searched using the identifiers *depression* and *exercise*. This yielded over 1,000 articles. To help narrow down results, reviews and RCTs were searched on this site. Nine relevant articles were obtained from the CINAHL database.

Third, PsycINFO was searched with the words *depression* and *exercise*. The search terms *elderly* and *children* were added to find age specific information. A total of eight articles were utilized from PsycINFO.

Dissemination of Project Information

This paper reports the evidence behind the effectiveness of exercise in treating depression. The target audience is psychiatric providers who create treatment plans for patients. The project displayed a power point presentation to colleagues with evidence to help future psychiatric providers. The twenty-minute power point presentation was sent out to ten colleagues. The colleagues found the information to be helpful information in their upcoming role. A few were surprised with the results of aerobic and non-aerobic exercise having equal efficacious results. A few common questions brought up by colleagues was the use of exercise

and a healthy diet in treating depression, how the task of writing out an exercise program should be completed, and how the findings could be implemented in an inpatient setting. Questions were answered via email after presentation was completed.

Review of the Literature

Depression is typically treated with the golden standard of psychopharmacology and psychotherapy, both proven effective in research. Exercise is known to produce both physical and mental health benefits. Exercise therapy may be more effective at reducing depressive symptoms when utilized as adjunctive therapy to psychopharmacology and/or psychotherapy rather than used alone (Cooney et al., 2013).

Exercise may have some moderating variables affecting outcomes. These include the type of exercise, the amount of exercise completed, and the length of time sticking to an exercise program. The severity of the disease/symptoms may also moderate the results. A severely depressed person being hospitalized may respond very differently than a stable person being seen in an outpatient setting (Stanton & Happell, 2013). These moderating variables are all taken into consideration.

Exercise and Depression in Adults

The literature shows promise in using exercise as part of treatment in depression. A systematic review conducted by Cooney et al. (2013) looked specifically at the effectiveness of exercise in treating depression in adults in comparison with no other treatment or comparator intervention. This included 39 trials with 2326 participants. The authors concluded that exercise is moderately more efficacious than a single control intervention in the reduction of depressive symptoms. In comparison to psychotherapies and psychopharmacological therapies, exercise is not more effective. Another systematic review looking at physical exercise and depression by

Eriksson & Gard (2011) examined eight articles that also concluded that exercise can have some efficacy in treatment against depression.

Settings

While reviewing the literature, it was found that the majority of research studies were conducted in outpatient or community settings. This could be due to the time not being long enough to start, control for, and complete exercise routine to evaluate. Stanton and Happell (2013) conducted the first systematic review at time of publication to examine exercise in treating depression in an inpatient setting. This review focused on the population as those diagnosed with depression by the Diagnostic and Statistical Manual of Mental Disorders 4th edition with the intervention being an aerobic or non-aerobic exercise training program or a combination of both of any duration or frequency (Diagnostic and Statistical Manual of Mental Disorders, 1994). This review found improvement in both the aerobic group and the non-aerobic group suggesting that aerobic exercise might be a valuable addition to usual care for the treatment of people in an inpatient setting.

Elderly Population

Due to the high incidence of depression in the elderly and changes happening in the body mentally and physically, it is important to focus on this population specifically. Heissel et al. (2015) conducted a pilot study looking at exercise programs for older depressive inpatients containing different exercise methods including aerobic, strength, and coordination training. This took place in Germany with 12 patients with major depressive disorder and a mean age of 68.7. The results showed that a four-week physical exercise program of either type of exercise was feasible and can be integrated into clinical routine of older major depressive disorder patients. As

this was a pilot study, the sample size was very small and the authors cannot be certain the results came from exercise alone as exercise was an additional treatment to the usual care.

A prospective randomized controlled trial by Huang, Liu, Tsai, Chin & Wong (2015) looked at physical fitness exercise versus cognitive behavior therapy on reducing the depressive symptoms among community dwelling elderly adults. The population consisted of 57 participants aged 65 years of age or older from three communities in northern Taiwan. After 12 weeks, CBT and exercise both had positive effects. The results yielded decreases in depressive symptoms and more social support with those in the CBT group. When considering the effectiveness in the decrease of depressive symptoms longer term, the increase in the six-minute walk distance and raising the patients' quality of life, physical fitness exercise program may be a better intervention for elderly adults with depressive symptoms. Problems with this study are: it can only be generalized to elderly with cognitive and physical disabilities, sample size was estimated based on data, and participants were only studied over a short period of time (Huang et al., 2015).

A quasi-experimental study by Azilyana & Justine (2016) looked at the effects of a behavioral and exercise program on depression and quality of life in community-dwelling older adults. Participants from this study were recruited from three different villages in Malaysia with the criteria to be over the age of 60 and able to perform activities of daily living with 63 subjects. The researchers believe that based on previous literature there is evidence that behavioral intervention and exercise may improve depression symptoms. This study was warranted since there was no combination of both together. The study found that a combination of behavioral intervention and exercise training may improve mood, motivation, and self-esteem, which could

enhance quality of life among older adults. A downfall of this study is the use of convenience sampling and a homogeneous sample with a similar background.

Another study focused on the elderly specifically of care homes. Underwood et al. (2013) conducted a cluster-randomized controlled trial for exercise for depression in elderly residents of care homes. Data were obtained from 861 individuals in 78 care homes aged 65 and older in two regions in England. The authors hypothesized that a moderate intensity exercise program would decrease the depressive symptoms in the residents of care homes. The results of the exercise intervention did not reduce depressive symptoms in residents of care homes. This is one of the few studies found with no promising results. This could potentially be related to the unique situation of these elderly patients in the care home.

The studies looking at treating depression with exercise in the elderly population showed positive evidence with the exception of elderly in care homes (Heissel et al., 2015; Huang et al., 2015; Azilyana & Justine, 2016 & Underwood et al., 2013). It is important to note that all the studies found were conducted outside of the United States. Exercise with elderly depressed persons may present different results in different areas of the world.

Pediatric/Adolescent Population

The majority of studies conducted on depression and exercise are on adults. It is important to consider exercise at the pediatric level. Larun, Nordheim, Ekeland, Hagen & Heian (2013) conducted a systematic review to look at exercise in prevention and treatment of anxiety and depression among children and young people. The participants were from young children up to the age of 20. Sixteen studies with a total of 1191 participants were included. The authors found a small effect in favor of exercise in treating depression, but the interventions and methods of measurement limit the ability to draw conclusions. It was determined that the benefits of

treating depression in children with exercise is unknown at this time because the evidence base is so scarce.

It is important to look at the effects of exercise specifically in the adolescent population as it can differ from young children. Carter, Morres, Repper & Callaghan (2015) conducted a qualitative exploration study to explore the experience of exercise for depressed adolescents. Twenty-six adolescents between the ages of 14-17 took part in an exercise program that was evaluated by a pragmatic randomized controlled trial. Improved mood, enjoyment and achievement, and benefits that transcend depressive symptoms reduction were reported by participants. It is possible the results were altered by the increased therapeutic contact received by participants while they attended the exercise sessions.

Methods of Exercise

It is important to look at how different types of exercise help depressive symptoms. Stanton, Reaburn & Happell (2013) conducted a narrative review to look at cardiovascular and resistance exercise in treating depression. A problem noted in the literature is the lack of exact exercises, order of performance, type of exercise machines, loading parameters, and other program details. The review looked specifically at studies on cardiovascular exercises alone, studies on resistance training alone, studies on combining cardiovascular exercise and resistance training, and studies comparing cardiovascular exercise and resistance training. The review found evidence for both exercises, either independently or combined, in the treatment of depression with different severity levels, ages and gender.

Most of the literature found focuses on aerobic and strength exercise. Meekums, Karkous & Nelson (2015) conducted a systematic review examining dance movement therapy for depression. The authors examined the effects of dance movement therapy for depression either

with or without standard care in comparison to no treatment or standard care alone. Evidence from three trials with a total of 147 participants was used. No conclusions were formed regarding the effectiveness of dance movement therapy for depression due to the low quality of evidence existing. Wang et al. (2013) conducted a systematic review to look at the effects of tai chi on depression, anxiety, and psychological well-being. Forty-two studies were included. The review found that the movements of tai chi may counteract erratic movements and thoughts by increasing awareness and eventually releasing muscle holding patterns and their associated emotions caused by stress. The results of the study indicated that tai chi interventions have beneficial effects for some populations on a range of psychological well-being measures. Although tai chi may have positive psychological effects, there are significant methodological limitations and more research is needed to establish the efficacy of tai chi in depression.

Exercise as Adjunctive Therapy

It is critical to examine the use of exercise as part of adjunctive therapy. Antidepressant medications are able to confound the understanding of the effectiveness of exercise on depression which may occur through biological pathways, behavioral pathways, and indirect pathways; some medications may act synergistically while others may be antagonistic (Bernard & Carayol, 2015). Carneiro, Fonseca, Vieira-Coelho, Mota & Vasconcelos-Raposo (2015) conducted a randomized clinical trial looking at the effects of structured exercise and pharmacotherapy versus pharmacotherapy for adults with depressive symptoms. This study included 26 women diagnosed with clinical depression. The results showed that aerobic exercise training could be an effective adjuvant therapy for treating women with depression, reducing depressive symptomatology and improving physical fitness. This study had a small sample size, increasing the risk for type II errors.

A systematic review by Danielsson, Noras, Waern & Carlsson (2013) was conducted to compare specific study types of aerobic exercise vs. antidepressants, aerobic exercise vs. any physical activity, and aerobic exercise as augmentation therapy to treatment as usual vs. treatment as usual. Fourteen studies were included with 1,139 participants. The authors found that aerobic exercise had no significant effect compared to antidepressants, aerobic exercise at a moderate to high intensity has no significant effect compared to other forms of physical activity, exercise as augmentation to treatment as usual has a small effect. Exercise thus appears to be beneficial in the treatment of depression when used in combination with medication, similar to what was found in the other literature.

A review by Fartlehner et al. (2016) was done looking at comparative benefits and harms of antidepressant, psychological, complementary, and exercise treatments for major depression. This was an evidence report for a clinical practice guideline from the American College of Physicians. The study found no significant difference in remission after 16 weeks for patients treated with sertraline and those assigned to aerobic exercise. This study had some limitations of high dropouts, dosing inequalities, and small sample sizes. The authors concluded that CBT and antidepressants are both the best choices for initial treatment of MDD (Fartlehner et al., 2016).

A single-site, three-armed randomized controlled study was done by Danielsson, Papoulias, Petersson, Carlsson & Waern (2014) to look at exercise or basic body awareness therapy as add-on treatment for major depression. Participants included 62 adults aged 18-65 with major depression. The authors confirmed the positive effects of exercise and indicated basic body awareness therapy has an effect on self-rated depression. The authors suggest that physical therapy can be a viable clinical strategy to inspire and guide persons with major depression to

exercise. The major weaknesses were the small sample size, increasing the risk of type II error and the self-rating of depression.

The existing literature suggests that exercise is effective when used as an adjunctive therapy. It may be combined with antidepressant medication or psychotherapy to produce positive effects. Its effectiveness as monotherapy has not yet shown positive results and will need to be further researched to determine efficacy (Carneiro et al., 2015; Danielsson et al., 2013; Fartlehner et al., 2016 & Danielsson et al., 2014).

Exercise on Insomnia

Insomnia is a major symptom and issue in major depressive disorder. Combs et al. (2014) looked at the impact of sleep complaints and depression outcomes among participants in the Standard Medical Intervention and long-term exercise study of exercise and pharmacotherapy for depression. The focus was on sleep, examining the effects of exercise and sertraline on disordered sleep in-patient with MDD. The authors created a secondary analysis of the Standard Medical Intervention and Long-term Exercise II (SMILE) study comparing different groups to the effects of treatment on sleep. The participants were 202 individuals with MDD in a 16-week randomized placebo-controlled trial comparing exercise and sertraline for treatment of MDD. The results showed that all treatment groups showed improvements during the trial, however, the active treatments did not show improvements to a bigger extent than the placebo. Another weakness was the assessment of sleep disturbance relied solely on self-report.

Summary

Most of the literature shows some promising evidence that exercise can help treat depressive symptoms. A majority of the evidence does state that both aerobic and non-aerobic exercise has proved efficacy in improving depressive symptoms. The literature frequently

recommends adding exercise ad adjunctive therapy to standard psychopharmacology or psychotherapy (Carneiro et al., 2015; Conney et al., 2013; Danielsson et al., 2013; Eriksson & Gard, 2011; Stanton & Happell, 2013 & Stanton et al., 2013).

Discussion

Interpretation

Some of the literature suggests exercise could be as effective as medication or psychotherapy (Carneiro et al., 2015; Danielsson et al., 2014; Danielsson et al., 2013 & Fartlehner et al., 2016). The literature does not recommend using exercise as treatment over the golden standards of psychopharmacology and psychotherapy, but rather using it as adjunctive therapy to produce more symptom relief in adults (Carneiro et al., 2015; Conney et al., 2013; Danielsson et al., 2013; Eriksson & Gard, 2011; Stanton & Happell, 2013 & Stanton et al., 2013). Further research is needed to determine its use as a primary treatment.

Outcome/Dissemination

Using exercise as adjunctive therapy for depression appears to be effective both from primary and secondary literature. It appears effective whether the patient is in inpatient or outpatient/community settings. The literature does not recommend using either aerobic or non-aerobic exercise over one another (Stanton et al., 2013). There is a shortage of literature available on alternative forms of exercise such as yoga, tai chi, and dance therapy. There is not enough support in the literature to recommend using exercise in the pediatric population for depression reduction. Use of exercise in the elderly population shows some promising results except for the use in care homes (Azilyana & Justine, 2016; Heissel et al., 2015; Huang et al., 2015 & Underwood et al., 2013).

Practice Recommendations

The recommendation for practice is to use exercise as an adjunctive therapy in addition to psychopharmacology and psychotherapy (Carneiro et al., 2015; Danielsson et al., 2013; Fartlehner et al., 2016 & Danielsson et al., 2014). Before prescribing exercise, a person's safety and ability need to be considered. Consider the person's health status, physical abilities, cognitive abilities, and financial considerations. Additionally, the practitioner should consider the person's desire to exercise while suffering from depressive symptoms. Utilizing exercise equipment could be dangerous for a client hospitalized for active suicidal ideation as they may attempt to harm themselves with the equipment. This needs to be determined on an individual basis and exercise programs need to be created based on patient variables. Wolff et al. (2011) recommends using individually adjusted training plans to maintain compliance and ensure an intensity level that will induce the intended changes desired.

Advanced practice psychiatric nursing should consider prescribing exercise therapy to patients suffering from depressive disorders. Exercise could be used as primary treatment, secondary treatment, or tertiary treatment following Neuman's Systems Model. The use of exercise as secondary and tertiary treatment can serve as adjunctive therapy to medication and psychotherapy. As a primary preventative measure, it could potentially help prevent disease while improving overall physical health and mood.

Education Recommendations

Education about exercise for depression will need to be communicated to all mental health providers. Specifically, providers need to educate their patients about exercise and the positive effects it creates. Wolff et al. (2011) recommends integrating exercise into psychoeducation and psychotherapy, an example using training and mood diaries.

Policy Recommendations

The evident supports public policy to promote exercise for the treatment of depression. The public may need access to and financial help to different methods of exercise. Exercise equipment or gym memberships could potentially be covered by medical insurance or health savings accounts to help promote exercise.

Research Recommendations

Due to the inconsistency of the literature, more research is needed on this topic. The literature review showed sample sizes were small, increasing the risk for type II errors. Research with larger sample sizes are needed.

The literature reviewed did not discuss any negative aspects of using exercise, it focused on the efficacy. Costs, risks, adverse events, and contraindications of exercise need to be specified (Wolff et al., 2011). Also, there are interactions of exercise with antidepressants producing a synergistic effect, antagonistic effect, or a behavioral effect. This needs to be tested in clinical settings (Bernard & Carayol, 2015).

The existing literature does not indicate the best type of exercise, intensity level, or duration of exercise needed for effect. It is important to have more information so that advanced practice nurses can treat most effectively. Wolf et al. (2011) recommends research looking at supervised vs unsupervised exercise and how patients' motivation can be sustained during and after exercise programs.

Conclusion

Depression is one of the most common mental illnesses affecting over 100 million people worldwide causing morbidity and mortality (Cooney et al., 2013). Depression increases the risk of decreased workplace productivity and absenteeism resulting in lowered income or

unemployment. Depression is usually treated with the golden standard of psychotherapy and psychopharmacology. There has been a recent interest in discovering complementary and alternative methods of disease management to help avoid medication side effects and improve overall health. There are multiple theoretical reasons of how exercise may improve depression, sparking an interest in this topic.

From the literature review, adults and elderly patients with a depressive disorder, who implement an exercise program as adjunctive therapy along with psychopharmacology and psychotherapy reduce their depressive symptoms. Advanced practice psychiatric nursing practice can be influenced by this study by prescribing exercise therapy as adjunctive therapy with medication and psychotherapy to patients suffering from depressive disorders either as primary, secondary, or tertiary treatment. More research is needed to determine its effectiveness as monotherapy or which type, intensity, and duration are of most benefit. More research is needed in the pediatric population to determine efficacy.

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