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Is Exercise an Effective Treatment for Reducing Anxiety in Patients with Panic Disorder?

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A SELECTIVE EVIDENCE BASED MEDICINE REVIEW

In Partial Fulfillment of the Requirements For

The Degree of Master of Science

In

Health Sciences- Physician Assistant

Department of Physician Assistant Studies
Philadelphia College of Osteopathic Medicine- GA Campus
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Abstract

OBJECTIVE: The objective of this selective EBM review is to determine whether or not exercise is an effective treatment for reducing anxiety in patients with panic disorder.

STUDY DESIGN: Systematic review of three English language randomized controlled trials published between 2008 and 2015.

DATA SOURCES: Three randomized controlled trials published in peer-reviewed journals comparing the effects of exercise on anxiety in patients with panic disorder using PubMed and EBSCO databases.

OUTCOMES MEASURED: The outcomes measured were improvement in anxiety symptoms in patients with panic disorder participating in exercise and fears related to anxiety-related sensations when patients were participating in exercise. These were measured by the Beck anxiety inventory.

RESULTS: One study in the review showed mild statistical significance in improvement of anxiety symptoms with exercise. One study showed that compared to cognitive behavioral therapy, exercise was not as effective of a treatment. Finally, one of the studies showed that exercise was statistically significant as a therapy for anxiety symptoms, but was still more effective when combined with cognitive behavioral therapy.

CONCLUSIONS: Based on these studies, exercise does have an effect on reducing anxiety symptoms in patients with panic disorder. However, exercise is more effective as an adjunctive therapy combined with the current first line treatment of cognitive behavioral therapy. Further investigation into this topic should be done as exercise is a cost-effective treatment that has various other health benefits outside of the benefit of reducing anxiety.

KEY WORDS: anxiety, panic disorder, exercise

INTRODUCTION

Panic disorder is characterized by having sudden and recurrent attacks of fear that last for at least several minutes and sometimes longer. These episodes of fear are called panic attacks. These attacks often make the patient feel like they are out of control and can cause physical symptoms such as increased heart rate, sweating, chills, tremors, shortness of breath, weakness, dizziness, numbness, tingling, chest pain, abdominal pain, and nausea. The patient experiencing a panic attack will often say that they felt a fear that they were going to die during the attack. Many patients experiencing a panic attack may feel like they are having a heart attack or another serious illness and go to an emergency room.² Patients with panic disorder who have repeated panic attacks often live in fear of when their next attack will occur. These patients will often try to avoid the area where they were when previous panic attacks occurred in fear that the place will trigger another episode.¹

This topic is relevant to the Physician Assistant practice because it is common across all populations of people and because it is often left untreated. Anxiety disorders, which include panic disorder, are the most common type of mental disorders in the population. The estimated 12-month prevalence of an anxiety disorder is 10% with these disorders being seen more often in women.³ The estimated 12 month prevalence of panic disorder specifically is 2.7% with 44.8% of these cases being classified as severe panic disorder.⁴ The average age of onset for this disorder is 24 years old, so this is an issue that is beginning in younger populations.⁴ While exact numbers of healthcare visits per year for panic disorder are unknown, currently it is estimated that only 59.1% of patients with panic disorder are receiving any type

of treatment and that 41.2% of those patients receiving treatment are receiving only minimal treatment.⁴ While the exact healthcare burden of panic disorder is not known, the cost of anxiety disorders, of which panic disorder is a part of, is estimated to be \$42.3 billion per year in the United States.³ Due to panic disorder mimicking other serious illnesses such as a heart attack, the visits associated with these attacks often involve extensive workups in order to rule out other causes of the symptoms.¹

Research is currently being done to learn more about the specific causes of panic disorder. This condition sometimes runs in families but there is no specific known reason as to why some families share the condition and some don't. Some research has shown that people with panic disorder understand normal body sensations as dangerous thus leading to the panic attack. Research also is looking into stress and environmental factors as triggers for the attacks.¹

Current treatment for panic disorder involved a combination of cognitive behavioral therapy and medication. The cognitive behavioral therapy is typically the first line treatment for the disorder and gives the patient new ways of dealing with and reacting to the emotions and feelings they have during a panic attack. Once the patient can learn to interpret the symptoms associated with the attacks as non-threatening, they can calm themselves down during or prior to an attack.¹ There are different types of medications that are currently being used to treat panic disorder including SSRIs, SNRIs, benzodiazepines, and beta-blockers. SSRIs and SNRIs are also used to treat depression but have been shown effective in panic disorder. These medications can take several weeks to have any effect. Beta blockers are not commonly prescribed in panic disorder patients but may be used to control the

symptom of rapid heart rate that occurs during some panic attacks. Benzodiazepines take swift effect and will calm a patient quickly during an attack. These medications are typically prescribed for a short period of time in severe situations. However, due to risk of addiction if overused they are prescribed with caution.¹ While cognitive behavioral therapy and pharmacotherapy have been shown to be effective in treating panic disorder, exercise would be a cost effective adjunctive treatment that would simultaneously have positive effects on overall well being such as improved cardiovascular health.

OBJECTIVE

The objective of this selective EBM review is to determine whether or not exercise is an effective treatment for reducing anxiety in patients with panic disorder.

SEARCH STRATEGY METHODS

The studies that were used in this systematic review were three randomized controlled trials, two of which were double blind studies. The population included patients with anxiety symptoms related to panic disorder. The intervention used in each of the studies was exercise, specifically aerobic exercise and endurance training. The population was compared to individuals with panic disorder who were not participating in exercise and those who were participating in cognitive behavioral therapy. The outcomes measured in the studies were improvement of symptoms of anxiety and decrease in fears related to anxiety- related sensations.

All of the articles were published in English in peer-reviewed journals and were searched using the PubMed and EBSCO databases. All of the studies were found using the keywords “panic disorder”, “anxiety”, and “exercise”. The articles were

selected based on patient-oriented evidence that matters (POEMS) that related to my topic. Inclusion criteria for the sources were randomized controlled trials that used exercise as an intervention. Exclusion criteria was different between studies but included patients with severe mental disorders, patients with suicidal tendency, patients with epilepsy or other CNS disorders, patients who were pregnant or breastfeeding, patients who were CI to participate in exercise, and patients who had changed their pharmacotherapy within the past 4 weeks prior to the study. Statistics used in this review included standard deviation, p score, confidence interval, and effect size. The specific demographics and characteristics of the studies can be found in Table 1.

Table 1: Demographics and Characteristics of included studies

Study	Type	#Pts	Age(yrs)	Inclusion Criteria	Exclusion Criteria	W/D	Interventions
Gaudlit z ⁵ (2015)	Randomized Control Trial-double blind	58	18-70	-Diagnosis of panic disorder with or without agoraphobia -Ages 18-70 -Ability to attend regularly (3 times weekly)	-Severe mental disorder -Acute suicidal tendency -Epilepsy or other CNS disorder -Pregnant or breastfeeding -CI with exercise -Changes in pharmacotherapy within 4 weeks of study	11	Endurance training 3 times weekly for 8 weeks for 30 minutes
Hovland ⁶ (2013)	Randomized Control Trial-double blind	36	18-50	Meets diagnostic criteria for panic disorder with or	Brain organic disorders, Psychotic disorders, Substance abuse, Medical	1	Aerobic exercise

				without agoraphobia	conditions preventing exercise, Severe major depressive disorder		
Smits ⁷ (2008)	Randomized Control Trial	60	18-51	Patients with panic disorder with elevated anxiety	No recent changes in psych meds(4weeks), no conditions preventing exercise	11	6, 20 minute exercise sessions with intensity of 70% of maximum heart rate intensity over 2 weeks

OUTCOME MEASURES

An outcome measured in all three studies was symptoms of anxiety. These anxiety symptoms were measured in all three studies via the Beck Anxiety Inventory. The Beck Anxiety Inventory is a 21-question self-assessment inventory that measures the severity of anxiety symptoms. The patient is asked to rate how badly each of the 21 symptoms has been an issue for them in the past week. The symptoms are rated on a 4-point scale going from 0 meaning not at all to 3 meaning severe.⁷

RESULTS

All three studies that are used in this review are randomized controlled trials that evaluated the effectiveness of exercise as a means of reducing anxiety in patients with panic disorder. The population in all three studies was patients with anxiety disorders, specifically those with panic disorder. For the comparison group, the studies used either patients not participating in exercise or those participating in only cognitive behavioral

therapy. All three studies contained continuous data that could not be converted into dichotomous data.

In the study by Gaudlitz, 58 patients with panic disorder were randomly assigned to either exercise (n=27) or control (n=31) group to determine the effectiveness of exercise on reducing anxiety in these panic disorder patients. Patients with severe mental disorders, suicidal tendencies, epilepsy or other CNS illnesses, pregnant or breastfeeding patients, and patients with a change to pharmacotherapy in the last 4 weeks were excluded from the study. Patients were also not able to change current treatment of their panic disorder or change their exercise routine in any way during the study. All patients in the study received eight sessions of cognitive behavioral therapy over a 1-month time period. In addition to the therapy, the experimental group participated in endurance training on a treadmill 3 times weekly at 30 min intervals for 8 weeks. Patients in the control group participated in sessions at the same time as the experimental group that involved very low impact movement such as stretching. The patients were evaluated via the Beck Anxiety Inventory after the cognitive behavioral therapy was completed, after the study was completed and at a 5-month follow up period after the end of the study. The analysis was done by modified intention-to-treat.

Of the 58 patients enrolled in the study, 3 patients dropped out before starting therapy sessions and 8 patients dropped out during therapy sessions, leaving a total of 47 patients. No patients were harmed during the study nor did any effects that were not intended occur. The results of this study did not show statistical significance from post-therapy and exercise to 5- month follow up ($p=0.068$). The effect size of the experimental group

was higher than the control group post-therapy, post-exercise, and at 5- month follow up. The values are listed in table 2.

Table 2- Effect size of experimental and control group

Group	Effect size- baseline	Effect size- post-exercise	Effect size- 5 month follow-up
Experimental	0.92	1.19	1.27
Control	0.66	0.78	0.67

In the study by Hovland, 36 patients with panic disorder were randomly assigned to either an experimental exercise treatment program (n=17) or to a control cognitive behavioral therapy treatment program (n=19). Patients in the exercise program attended 3 weekly sessions for 12 weeks in which they participated in aerobic exercises and circuit training. The patients in the cognitive behavioral therapy group attended one session weekly for 12 weeks. Patients were excluded from the study if they had brain organic disorders, psychotic disorders, substance abuse problems, medical conditions prohibiting exercise, or currently in a severe major depressive episode. Patients in the study were evaluated using the Beck Anxiety Inventory prior to treatment, immediately following treatment, 6 months post-treatment, and 12 months post-treatment.

Of the 36 patients involved in the study, only 1 patient dropped out of the study. The results of the study showed that while exercise was effective at reducing levels of anxiety, cognitive behavioral therapy was more effective. However, specifically at the 12-month follow up the exercise group showed significant results. The values for the mean and the effect size measured through the Beck Anxiety Inventory are listed in Table 3.

Table 3- Mean and Effect Size

Beck anxiety inventory score	Exercise Group		Cognitive Behavioral Therapy Group	
	Mean(SD)	Effect size	Mean(SD)	Effect size
Pre-treatment	22.06(10.78)	-0.51	22.32(10.46)	-0.39
Post- treatment	15.65(14.18)	-0.94	10.11(7.71)	-1.82
6-month follow up	13.59(11.89)	-1.21	9.42(8.51)	-1.82
12-month follow up	13.95(11.81)	-1.19	10.59(9.82)	-1.58

In the study by Smits, patients with heightened levels of anxiety due to panic disorder were randomly assigned to one of three groups. One group of patients was assigned to an exercise group (n=19), one to an exercise plus cognitive restructuring (n=21), and one to a control group (n=20). Patients were assessed before treatment began, mid-treatment, 1 week post-treatment, and 3 weeks post-treatment. Patients were excluded from the study if they had conditions preventing them from participating in physical activity, if they had any recent change to psychiatric medications, and if they were currently receiving psychotherapy.

Of the 60 patients involved in the study, there were 11 participants who dropped out. Most of these left prior to the mid-treatment phase. The study found that both groups who participated in exercise showed significant improvements in anxiety symptoms compared to the control group. Both conditions involving exercise compared to the control group showed lower scores on the Beck Anxiety Inventory post-treatment ($p < 0.005$) and over time ($p = 0.001$). The values for the mean and standard deviation of the Beck Anxiety Inventory scores for all phases of the study are listed in Table 4.

Table 4- Mean and Standard Deviation

Beck Anxiety Inventory	Control		Exercise		Exercise + CBT	
	Mean	SD	Mean	SD	Mean	SD
Pre-treatment	21.65	9.63	24.68	8.68	19.14	8.84
Mid-treatment	21.16	17.29	16.82	8.50	18.00	13.63
Post-treatment	18.26	10.24	10.19	6.54	9.07	9.38
Follow-Up	18.69	12.31	9.00	6.95	6.64	5.84

DISCUSSION

While there has not been extensive research done on exercise as a treatment for anxiety, exercise has been shown to decrease tension in the body, improve mood, improve sleep quality, and improve self-esteem.⁸ Improving these factors are all ways of improving symptoms of anxiety, especially in patients with anxiety disorders. Outside of these effects, exercise also has a positive effect on overall cardiovascular health, which remains the number one cause of death for men and women in the United States.⁹

In these studies discussed above, there were no contraindications for patients participating in exercise outside of being physically unable to participate.⁵⁻⁷ There were some limitations to the studies due to the lack of studies that evaluated exercise as a treatment for anxiety in patients with panic disorder. Each study that was used had a small sample size with less than 100 participants.⁵⁻⁷ In the study by Smits, the sample did not have wide distribution when it came to age.⁷ In all three studies, the results were based on self-reported measures via patients answering questions on the Beck Anxiety Inventory.⁵⁻⁷ It should also be noted that the participants in the study were volunteers.⁵⁻⁷

CONCLUSION

Based on these studies, it shows that exercise is effective in reducing anxiety in patients with panic disorder. However, it does not seem to be more effective than the

current first line therapy of cognitive behavioral therapy. In the study by Smits, it seems that exercise in conjunction with therapy seemed to be most effective.⁷ In the future, more research should be done in regards to exercise as a treatment for anxiety in patients with panic disorder as it is a cost-effective therapy that also has many other health benefits for patients.

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