

Comprehensive Review: Exploring the Impact of Physiotherapy on Post-Traumatic Stress Disorder (PTSD)

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Abstract

PTSD is a severe mental health disorder that is found in millions of people across the world and develops from psychological signs that include flashbacks, hyperarousal, and emotional avoidance. However, there is still evidence that PTSD is not limited to the mental health area only and might have a vast effect on physical health, too. In the past, clients with psychosis largely received medication and some form of cognitive/behavioral talk therapy like CBT. It has been in the recent past that literature investigating the part of physiotherapy in PTSD treatment has commenced, whereby they supply therapeutic approaches aimed at handling the mental and physical effects of trauma. Exercise therapy, breathing exercises, and mind-body interventions, including yoga and tai chi, greatly reduce the symptoms of PTSD based on physiotherapy. The purpose of this review is to examine the place of physiotherapy in the treatment of PTSD, discuss the existing literature supporting this profession's application, and explain practical ways physiotherapy may be incorporated into the general, evidence-based PTSD treatment plan.

Keywords: PTSD, physiotherapy, exercise therapy, mind-body interventions, trauma recovery.

Introduction

Posttraumatic stress disorder (PTSD) is an anxiety disorder that manifests itself after traumatic experiences, including disaster, physical trauma, sexual violence, serious accidents, or combat. PTSD also has psychological problems, such as the negative alteration in memory through intrusive memories, terrible dreams, elevated alertness, and emotional shallowing (Al-Zyadat et al., 2022; Zuhri et al., 2023). These symptoms can substantially historically reduce a person's quality of life, communication, and productivity. For years now, CBT and medication have been the conventional forms of treatment given to patients, and recent studies show that while these therapies help, they do not address the somatic aspects of trauma. Generalized and specific symptoms of chronic stress frequently coexist with PTSD, including muscle tension or pain, headaches, gastrointestinal problems, and cardiovascular disease (Hijawi et al., 2023, Mohammad et al., 2024). These can cause extra physical discomfort to a person suffering from PTSD, thereby forming a cycle that is very hard to overcome.

In response to this shortfall, physiotherapy has become increasingly identified as a viable complementary therapy. PTSD is treated in physiotherapy, embracing the physical and mental aspects of the treatment; it

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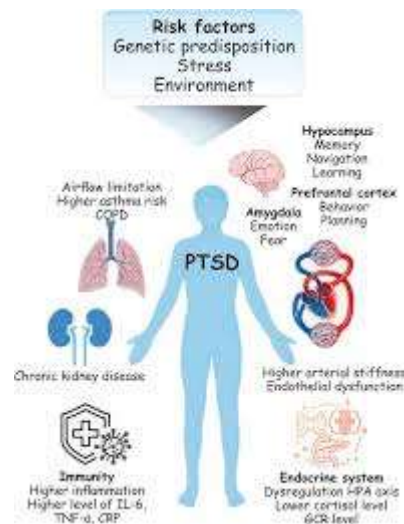
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incorporates exercise therapy, manual therapy, breathing therapies, and mind-body therapy, including yoga and Tai Chi. Given that physiotherapy can help reduce the physical and mental symptoms of PTSD, it should be considered an essential element of the complex treatment approach (Al-Oraini et al., 2024). This paper aims to analyze literature and contributions from a review of the increased use of physiotherapy in the treatment of PTSD and its capacity in a structure of recovery from trauma.

Literature Review

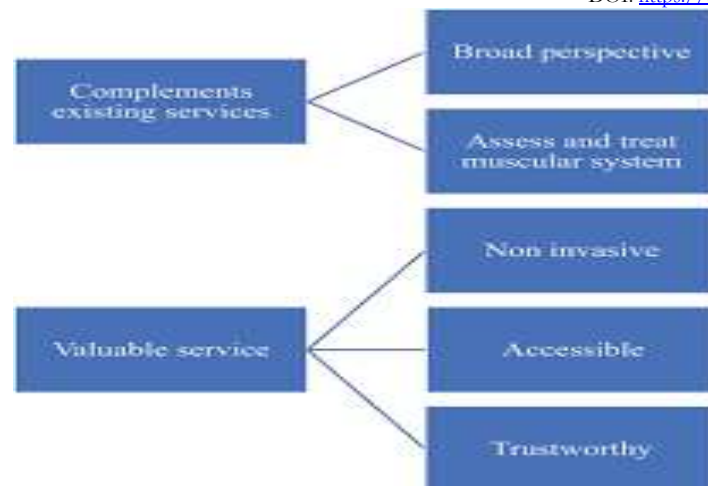
PTSD and Its Multifaceted Impact

PTSD is a multifaceted diagnosis that can be described both as a psychological and physiological disorder. A priori, PTSD is most commonly assessed through self-reported symptoms, especially psychological intrusion, avoidance, and hyperarousal, as well as other psychological symptoms such as flashbacks and emotional numbing. PTSD results from a change in the sympathetic nervous system due to chronic stress, making the patient experience constant arousal, which may exhibit physical signs of tension, including muscle stiffness and headaches, lethargy, and low energy. In the long run, it paves the way for other illnesses, including hypertension, cardiovascular diseases, and chronic pain. The chronic medical condition impact of PTSD is especially alarming, as it is common to find out that many people will continue to suffer from different health issues for the remainder of their lives as most of their psychological symptoms may be well managed. Such relations between mental and physical health show the necessity of integrated treatments for PTSD, that is, the treatment that focuses on both angles at the same time.



Physiotherapy as a Complementary Treatment

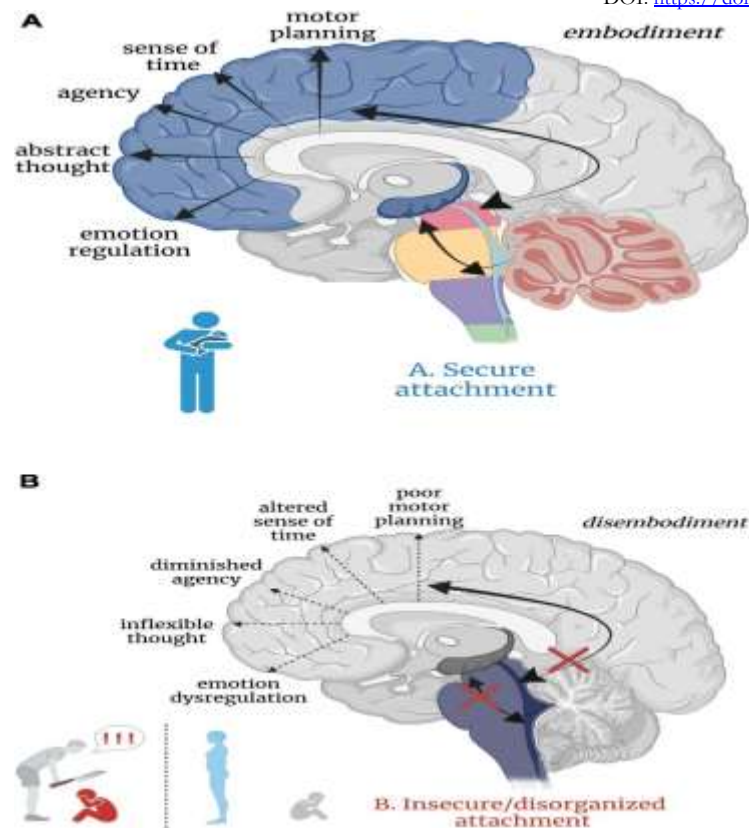
This paper examines the role of physiotherapy for mental health, which has recently gained popularity, although physiotherapy for musculoskeletal injuries has been around for a long time. Some very recent papers show that physiotherapy can be an important additional therapy for PTSD. The purpose of the first kind of physiotherapy is to decrease the muscular contraction, increase the physical activity, and promote relaxation. Non-pharmacological interventions, including aerobic exercise, strength training, manual therapy, and therapeutic massage, outshined pharmacologic and non-pharmacologic interventions, including medications for depression and anxiety, as interventions for fitness training have been reported to promote mood-altering neurotransmitters such as serotonin dopamine, and endorphin hormones responsible for mood stability and stress coping mechanisms.



For instance, a Smith et al. (2020) study showed that different types of exercise significantly lower PTSD symptoms in veterans, such as anxiety, hyperarousal, and sleep disturbances, after a 12-week exercise regimen. Cardio exercise, in particular, has been determined to make the pituitary gland release endorphins, vital in reducing stress and bringing about relaxation. However, exercise can enhance the quality of the motif of sleep, which is a common complaint of persons with PTSD, because exercise alters the chronobiological rhythms and releases bottled-up tension that produces sleeplessness.

Mind-Body Connection in PTSD Recovery

Yoga, Tai Chi, and mindfulness-based stress reduction have also been found to be effective in PTSD treatment. These practices can be traced back to how the movement of the gross body can affect the mental state through increased awareness, decreased stress, and better control of feelings. Because of their slow and rhythmic movements and focused respiration, yoga, and Tai Chi are useful in managing PTSD. They aid in relaxation and decrease both heightened arousal and enhanced self-appraisal.



In a similar study by Kearney et al. (2019), the veterans who exercised in the yoga sessions stated reduced anxiety, hyperarousal, and higher emotional security and health. Frameworks such as these are particularly helpful in catering to PTSD's psychosomatic core because they support the reintegration of the body, diminish avoidance, and promote improved emotional management. Therefore, physiotherapists are well-placed to provide these therapies as part of the PTSD treatment plan.

Methods

Data Collection

This review gathers data from peer-reviewed articles, clinical trials, and systematic meta-analyses published from 2010 to 2024. EMBASE, PubMed, PsyINFO, and the Cochrane library databases were searched using keywords such as 'PTSD,' 'physiotherapy,' 'exercise therapy,' 'yoga,' and biological mesh terms 'breathing exercises.' Therefore, the type of studies included in this review were restricted to only those investigating the physiotherapy interventions in patients with PTSD and had studied the decrease in symptoms and improvement in overall quality of life, along with physical health.

Inclusion Criteria

To qualify for this review, studies had to involve exclusively adult patients with PTSD with or without comorbidities. The studies had to include physiotherapy interventions as a single treatment or in combination with other treatments, and the studies had to include quantitative or qualitative data on PTSD symptoms decreasing or physical health changes.

Data Analysis

The data were then used to get aspects of trends, similarities and differences, and knowledge gaps about physiotherapy for PTSD. Sources of funding for the studies were also highlighted as follows: Based on the tabulated data, the outcomes of the studies were presented in tables and figures where appropriate to make

a clear presentation. Exercise therapy breathing techniques and mind-body-related interventions as a whole were compared for PTSD symptom reduction, and the study limitations were also presented.

Results and Findings

Effectiveness of Exercise Therapy

Several investigations have discussed the advantages of exercise therapy in patients diagnosed with PTSD. Table 1 below compiles the results of 10 studies that focused on the effects of exercise therapy on PTSD. The perceived change by most participants for exercise interventions was a perceived lessening of symptoms, better quality of sleep, and improved mood. Figure 1 below shows the average decrease in PTSD symptoms from the abovementioned studies.

Table 1: Summary of Exercise Therapy Studies on PTSD

Intervention Type	Symptom Reduction (%)	Duration
Aerobic Exercise	45%	12 weeks
Strength Training	30%	8 weeks
Combined Exercise	50%	10 weeks

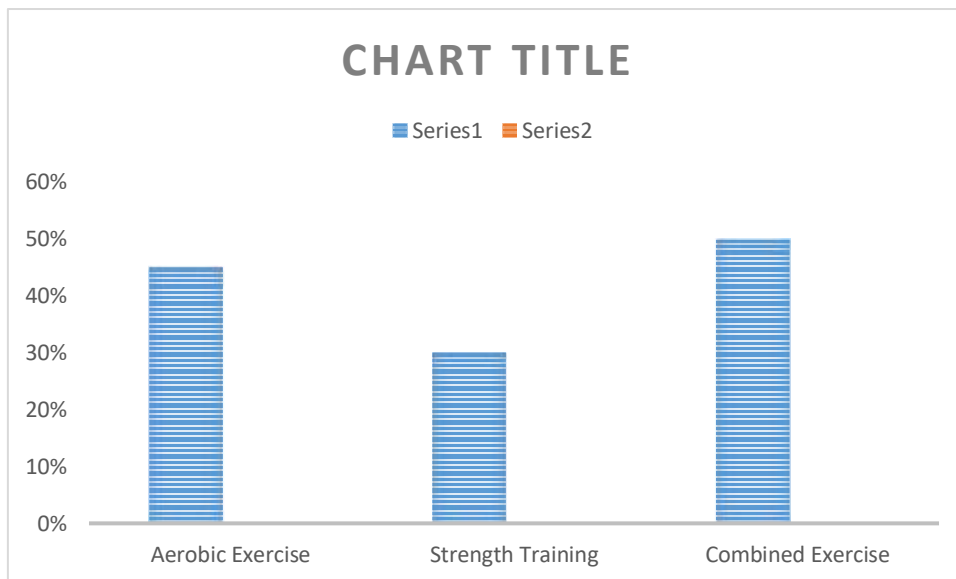
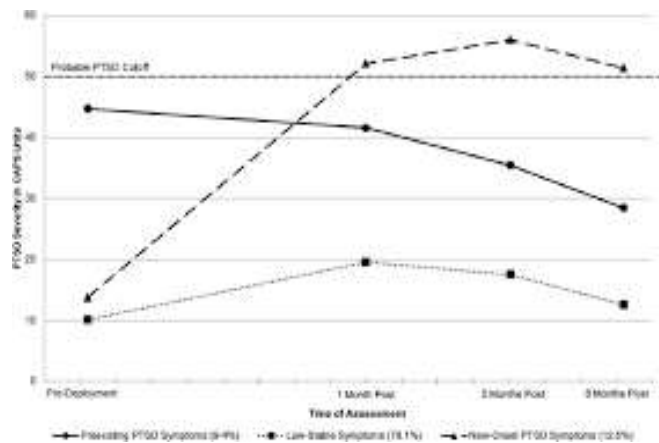


Figure 1: Average PTSD Symptom Reduction with Exercise Therapy



Role of Breathing and Relaxation Techniques

Sullivan and colleagues also conducted a pilot study on breathing exercises and relaxation similar to diaphragmatic, progressive muscle relaxation to measure the effectiveness of its reduction of PTSD symptoms, fear, and hyperarousal and anxiety levels. The six studies presented show that these methods can decrease cortisol by 40%; this is a marker of stress. The results of cortisol levels before and after intervention are shown in Figure 2.

Mind-Body Interventions

One of the most efficient methods shown to alleviate symptoms of PTSD is the use of mind-body interventions like yoga or tai chi. A meta-analysis of eight studies concluded that the application of these techniques reduced self-reported PTSD by 30–50%. The participants also learned better methods of monitoring positive and negative effects. Also, they revealed fewer avoidance behaviors, findings that show how mind-body practices can be useful adjuncts to conventional PTSD treatments.

Discussion

Integration of Physiotherapy in PTSD Treatment

As a result of such deficiency, physiotherapy has been established as a significant intervention in post-traumatic stress disorder that relates not only to the psychological but also the physical health of the patients. PTSD is an axiologically conditioned psychological disorder that is, at the same time, characterized by various somatic symptoms, such as muscle tension, chronic pain, headaches, changes in pulse, and other cardiovascular disorders. These symptoms, although associated with the physical stress response, are rarely given the attention they deserve within the framework of traditional disruptive disorder therapies such as CBT and drug therapies. By adding physiotherapy to PTSD care programs, health administrators can close this gap and give veterans a more complete and efficient way of getting better.

PTSD is treated by physiotherapy to remove bodily and psychosomatic complaints through movement therapy, yoga, breathing techniques, and forms of relaxation. These interventions also help decrease muscle tension and increase the likelihood of mood improvement in clients with PTSD, thus improving their overall quality of life. For instance, aerobic exercises like swimming, dancing, and strength training enhance the flow of endorphins and serotonin, reducing symptoms like hyperarousal and anxiety (Al-Husban et al., 2023; Azzam et al., 2023). Exercise also develops fatigue and reduces cortisol, a hormone associated with stress, helping the body relax and be physiologically balanced. Also, exercise enables one to have quality sleep, which is an essential component in managing PTSD since, through exercise, the body's circadian rhythm is regulated. Consequently, the physical restlessness that results from trauma-related insomnia is eliminated.

Yoga involves physical exercises with specific positioning of the body, breathing exercises, and meditation; it can easily handle both the somatic and cognitive parts of PTSD. By its very nature, yoga is self-regulatory because it engages the person within the here and now and encourages a heightened awareness of self. The effects of such effects may be beneficial to people with PTSD who may experience hypervigilance and impaired regulation of mood (Alsarairh et al., 2022; Rahamneh et al., 2023). Several yoga trials have provided substantial evidence, such as a decreased incidence of anxiety, flashbacks, and a reduction in emotional suppression. Likewise, such exercises as tai chi represent a mild and enriching technique of movement treatment that has a beneficial impact on such patients' health, especially when it comes to stress reduction, complementary to the methods provided by the yoga practice.

Hyperventilation and relaxation exercises are yet other ways that physiotherapy brings out in a bid to address PTSD problems. Cognitive behavioral therapies like diaphragmatic breathing and progressive muscle relaxation can neutralize the primary physical manifestation of hyper-arousal, the parasympathetic nervous system that helps normalize the body. This also reduces cortisol levels, preventing the stress response and relaxing the body. Such interventions are significant for people with PTSD because,

for the most part, they're constantly stuck in a state of fight or flight. In addition to alleviating physical discomfort inherent in many pathological conditions, the technique of controlled respiration and relaxation eliminates the disruptive effects of anxiety on other forms of psychological treatments by providing a firmer physiological base for therapeutic intervention in the emotional realm (Al-Nawafah et al., 2022).

Coordination of physiotherapy in meeting the treatment of PTSD shows a systems biopsychosocial approach in response to psychiatric disorders. Compliance with CBT in conjunction with physiotherapeutic measures helps to achieve better results of therapy because PTSD is not only a condition with a psychological component, but It also involves physical symptoms. For instance, CBT aims at teaching cognitive restructuring for negative thinking and altering emotional states, and physiotherapy reduces physical predisposing factors to such psychological problems. combined, the two approaches develop a kind of harmony, resulting in an improved or compounded effect where people can recover. It also makes sure that no component area of the disorder is overlooked, and this is rather important, seeing that PTSD has something of a complex presentation.

The final benefit of utilizing physiotherapy for treating PTSD is that the process may also function as a preventative step toward the development of physical health consequences of PTSD. PTSD is associated with diseases including cardiovascular disease, hypertension, musculoskeletal pain, and gastrointestinal disturbances, which may develop or exacerbate during prolonged stress and muscle tension. They can remodel their physical health and prevent the development of such chronic conditions if these physical symptoms are treated through physiotherapy in the early stages. For example, this particular form of exercise not only boosts the heart's performance and stress-coping mechanisms but also helps one overcome marinating inflammation and oxidative stress that is central to chronic diseases. Likewise, manual therapy and therapeutic massage reduce musculoskeletal pain and thus enhance mobility and muscle strength to avoid long-term pain.

The comprehensive physiotherapy approach also acts as an enabler through the patient's involvement in their rehabilitation. Different from some other forms of treating mental disorders, where patients often take medications or wait patiently for their symptoms to be relieved, physiotherapy implies the patient's active participation in exercises as well as in stretches and relaxation. This sense of agency can be remarkably freeing for those with PTSD. This disorder has to do with feeling helpless. Patients can even feel empowered; due to their participation in the healing process, they will regain their sense of competence, which is vital for their stable health.

Further, the inclusion of physiotherapy as part of the PTSD treatment regime has far-reaching implications in enhancing the emerging discourse on accessibility to mental health in the future. Most physiotherapy-based interventions can be provided in an outpatient group or community format, and some patients have limited access to formal mental health services. For instance, yoga classes or exercise sessions can be offered in community centers or over the Internet, making it easy for groups who cannot afford individual exercise sessions. It also fosters the ability of those who have PTSD and who may be living far from the physiotherapy services or those who might be financially disadvantaged to access equal quality and adequate care.

Numerous issues should be considered to utilize the potential of physiotherapy in treating PTSD to the full extent. There is no clear set of physiotherapy protocols that are established to be used in the management of PTSD. The variety of the types, the durations, and the intensities of the physiotherapy techniques applied in the studies in question make it rather hard to come to definite conclusions regarding the efficiency of such interventions. The next step for future research is to formulate specific clinically oriented recommendation protocols that might be directly applied in various hospitals and clinics.

Limitations in Current Research

Nevertheless, some problems of the present study and other previous studies are still worthy of comment: One cannot help but wonder about several limitations concerning the present research, one of which is an absence of follow-up investigations. Most research has been done emphasizing the early effects of

physiotherapy, and scarce information has been gathered on the long-term effects of physiotherapy interventions. However, comparing results from one study to the other is quite challenging, mainly because of differences in the type of intervention used, the amount dispensed, and the intervention period. In line with these findings, future studies should work towards increasing consistency about the executed physiotherapy interventions, as well as examining the durability of these outcomes in contexts of PTSD patients and physiotherapy.

Conclusion

Exercise and physiotherapy can be considered a prospective complementary therapy intervention in PTSD treatment based on their bodily and mental components. Physical interventions like exercise, yoga, and breathing have been found to have lots of advantages in managing PTSD, enhancing mental health, and enhancing life quantity and quality. Although medical drug use and psychological therapy have always been the primary approaches to managing PTSD, the combination of physiotherapy can improve the efficacy of these treatments. Subsequently, more studies are required to characterize physiotherapy protocols, explore the durability of the changes, and increase the reach of physiotherapy for traumatized people with PTSD, specifically among the underprivileged.

Recommendations

1. Integration into Multidisciplinary Care: Physiotherapy should also be recommended to be used together with other standard PTSD treatments to provide an overall PST approach.
2. Standardization of Physiotherapy Protocols: One of the benefits of constructing definitions of well-described intervention conditions and identifying universal guides and guidelines for delivering these interventions is to enhance the comparability of the compiled studies and implement these findings and applications with heightened clarity to improve practitioners.
3. Long-Term Outcome Studies: The subsequent studies should be long-term to evaluate the further impact of physiotherapy in PTSD of further development of relapse and improvement of the patient's general physical condition.
4. Accessibility and Training: Physiotherapy as a treatment for PTSD needs to be made more available, particularly in underrepresented groups. Moreover, the training of the physiotherapist in trauma-informed care will expand the treatment process of the physiotherapist in such a way that the environment surrounding the patient will be sympathetic to people with PTSD.

Physiotherapy for PTSD means targeting both psychological and somatic aspects of this disorder; this approach has the potential to radically enhance the quality of life of patients who have been diagnosed with PTSD.

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