

Evaluating the Effectiveness of Prescribed Strength Training as an Adjunct to Antidepressants in Male Outpatients Presenting with Depression

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Abstract

This study examines the effectiveness of prescribed strength training as an adjunct to antidepressant treatment in males presenting with depression in the Badulla district of Sri Lanka. Participants were males aged 18-46 years who attended mental health services as outpatients. Exclusions included those with significant medical conditions and comorbid mental illnesses. Participants were divided into two groups: those who engaged in strength training for a minimum of 30 minutes at least three times per week for one month and those who did not. The Beck Depression Inventory (BDI), validated for Sinhala, was used to measure depression levels before and after the intervention. Statistical analyses, including paired and independent t-tests, revealed significant reductions in BDI scores across both groups, with more pronounced improvements in those who engaged in strength training. The effect size, calculated using Cohen's d, demonstrated a medium-to-large effect, indicating the clinical significance of strength training as an adjunct to antidepressants. These findings suggest that strength training may serve as an effective adjunct to antidepressant treatment in reducing depression symptoms.

Keywords: Depression, Strength training, Antidepressants, Beck Depression Inventory, Sinhala, Sri Lanka

Introduction

Depression is a significant mental health disorder affecting over 280 million people worldwide (World Health Organization [WHO], 2023). It is characterized by persistent sadness, loss of interest in activities, and a variety of physical and psychological symptoms that can severely impair daily functioning (American Psychiatric Association [APA], 2013). In Sri Lanka, the prevalence of depression is reported to be around 10% among adults, with higher rates in rural areas (Fernando et al., 2020). This disorder can have

debilitating effects on an individual's quality of life, leading to impaired functioning across various domains. Standard treatment protocols often include pharmacological interventions, such as antidepressants, alongside psychosocial interventions. However, there is growing interest in exploring the benefits of non-pharmacological interventions, such as physical exercise, in the management of depression.

Literature Review

Usefulness of Exercise in Male Depression

Physical exercise, including strength training, has been shown to improve mood, reduce symptoms of anxiety and depression, and enhance overall well-being (Mammen & Faulkner, 2013; Schuch et al., 2016). The antidepressant effects of exercise are believed to be mediated through various mechanisms, including increased endorphin levels, enhanced monoamine neurotransmitter function, and reduced inflammation (Jordans et al., 2021; Tovote et al., 2020).

Endorphins, often referred to as "happy hormones," are neurotransmitters that play a crucial role in mood regulation. Exercise, particularly strength training, has been shown to increase the release of endorphins, which can contribute to the alleviation of depressive symptoms (Liu et al., 2022).

Muscle training, in particular, has been associated with higher endorphin levels due to the physical stress it places on the muscle mass, leading to increased endorphin production (Harber et al., 2004; Ye et al., 2023). The consistent release of endorphins during strength training not only contributes to improved mood and reduced anxiety but also enhances overall well-being and resilience to stress (Fetzner & Asmundson, 2015).

In males, strength training may offer unique benefits due to its focus on building physical strength and

resilience, which can positively influence self-esteem and body image (Sullivan et al., 2022). A meta-analysis by Schuch et al. (2016) demonstrated that exercise has a moderate to large effect size in reducing symptoms of depression, particularly in clinical populations. Furthermore, research suggests that structured physical activity can serve as a coping mechanism, reducing stress and improving mood among men (Sisson et al., 2021).

Differences Between Male and Female Depression

Depression manifests differently in males and females, with males often exhibiting irritability, anger, and risk-taking behaviors rather than the typical sadness and withdrawal seen in females (Levinson et al., 2020). These gender differences have implications for treatment, as males are less likely to seek help for depression and may benefit from interventions that align with their coping styles, such as physical exercise (Addis, 2008). The stigma surrounding mental health issues in men further complicates their willingness to engage in treatment, highlighting the need for accessible and acceptable treatment modalities like exercise (Mahalik et al., 2003).

Research indicates that men are more likely to engage in self-destructive behaviors, such as substance abuse, as a means of coping with depressive symptoms, which can mask the underlying depression and complicate diagnosis and treatment (Kilmartin, 2005). Therefore, interventions that encourage healthy coping strategies, such as physical activity, are particularly valuable in the male population.

Depression Prevalence in Sri Lanka and the World

Globally, depression is a leading cause of disability, with significant variation in prevalence across different regions (WHO, 2023). In Sri Lanka, studies have indicated that depression is a major public health concern, with rural populations being particularly vulnerable due to socioeconomic factors, limited access to mental health services, and the ongoing effects of past conflict (Jayasekara & Schultz, 2007). A community-based study in Sri Lanka found that the prevalence of depression was higher among women and the elderly, with socioeconomic status, physical illness, and lack of social support being significant risk factors (Rodrigo et al., 2010).

The global burden of depression underscores the need for effective and accessible treatments. In low- and middle-income countries like Sri Lanka, where mental health resources are often limited, integrating non-pharmacological interventions, such as exercise, into routine care could enhance treatment outcomes and reduce the overall burden of depression (Patel et al., 2011; Vancampfort et al., 2021).

Validation of the Beck Depression Inventory in Sinhala

The Beck Depression Inventory (BDI) is a widely used self-report measure for assessing the severity of depression. The BDI has been validated for use in various languages, including Sinhala, ensuring its reliability and validity in the Sri Lankan context (Rodrigo et al., 2015). The Sinhala version of the BDI was used in this study to accurately assess depression levels among the participants. This validation process is crucial for ensuring that the tool is culturally appropriate and accurately reflects the depressive symptoms experienced by Sri Lankan populations.

Aims and Objectives

To evaluate the effectiveness of prescribed strength training as an adjunct to antidepressant treatment in males presenting with depression in the Badulla district of Sri Lanka through a comparative analysis of those who did not undergo prescribed strength training.

Method

Participants

The study involved male outpatients aged 18-46 years from mental health services in the Badulla district, Sri Lanka. Participants with medical conditions affecting exercise tolerance, such as ischemic heart disease, hypertension, and chronic lung diseases, were excluded. Patients with comorbid mental illness diagnoses apart from depression were also excluded to minimize confounding. The final sample consisted of 117 participants, with 28 engaging in prescribed strength training and 57 not engaging in strength training. 32 individuals who were prescribed strength training but did not complete the prescribed regimen were excluded from the study.

Measures

Depression levels were assessed using the Sinhala version of the Beck Depression Inventory (BDI), a validated and widely used self-report measure that evaluates the severity of depression symptoms. The BDI was administered before the start of the intervention and after one month.

Procedure

Participants were prescribed a minimum of 30 minutes of strength training at least three times per week for one month, in addition to their regular antidepressant medication and routine psychosocial interventions. The BDI scores of participants who adhered to the strength training regimen were compared to those who did not receive specifically prescribed strength training exercises.

Statistical Analysis

To assess the effectiveness of the intervention, paired t-tests were conducted to compare pre- and post-intervention BDI scores within each group. Additionally, an independent t-test was performed to compare post-intervention BDI scores between the two groups. Cohen's d was calculated to determine the effect size of strength training on depression outcomes.

Results

Paired t-test for Participants Engaged in Strength Training

Participants who engaged in strength training showed a significant reduction in BDI scores, with a mean score decrease from 14.24 (SD = 0.84) to 6.28 (SD = 0.48). The paired t-test yielded a t-statistic of 4.66×10^{16} and a p-value of 0.0, indicating a highly significant improvement in depression symptoms ($p < 0.05$). The effect size, calculated using Cohen's d, was 1.96, indicating a large effect of strength training on reducing depression symptoms.

Paired t-test for Participants Not Prescribed Strength Training

Similarly, participants who did not engage in strength training also experienced a significant reduction in BDI scores, with a mean decrease from 15.34 (SD = 0.72) to 12.37 (SD = 0.58). the p-value < 0.05 , reflecting a

highly significant change in depression symptoms ($p < 0.05$). The effect size was calculated as 0.67, indicating a moderate effect of the general antidepressant treatment on reducing depression symptoms.

Independent t-test Comparing Strength Training vs. No Strength Training

The independent t-test revealed a significant difference in post-intervention BDI scores between participants who engaged in strength training and those who did not ($t = 4.27$, $p < 0.05$). The strength training group had a lower mean BDI score (6.28, SD = 0.48) compared to the non-strength training group (12.37, SD = 0.58), demonstrating a substantial benefit of strength training as an adjunct to antidepressants.

Discussion

The results of this study support the effectiveness of prescribed strength training as an adjunct to antidepressant treatment for males presenting with depression. Participants who engaged in strength training showed greater reductions in depression symptoms compared to those who did not participate in strength training, with a large effect size indicating significant clinical improvement. These findings align with recent research highlighting the benefits of exercise, including strength training, in managing depression and enhancing treatment outcomes (Schuch et al., 2016; Schuch et al., 2022).

Conclusions

Prescribed strength training appears to be a valuable adjunct to antidepressant treatment in reducing depression symptoms among males in the Badulla district of Sri Lanka. The significant improvements observed in the strength training group suggest that integrating physical exercise into standard treatment protocols could enhance overall treatment efficacy and support better mental health outcomes. Future research should explore long-term effects and the potential mechanisms underlying these benefits.

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