

The Impact of Physical Activity on Individuals With Depression

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LOU Research Initiative

Summer 2024

Abstract

In this review, we will investigate the influence of different exercise kinds, lengths, and intensities on reducing depression symptoms, with a focus on the relationship between exercise and cognitive disease treatment. By improving mood, mental health, and physical well-being, various forms of exercise, such as aerobic, mind-body, and flexibility exercises, can significantly reduce the effects of depression. Exercise time and intensity are also important factors; moderate-to-vigorous physical activity and high-intensity exercises have been shown to have the greatest effects on lowering depression. Additionally, it is noted that combining therapy and exercise is a highly successful strategy that has beneficial impacts on mood and therapeutic outcomes. The outcomes emphasize the significance of personalizing workout routines to meet the needs of each individual and highlight the benefits of exercise as an additional treatment for depression.

Introduction

Millions of people worldwide suffer from depression, a widespread mental health illness that frequently causes severe impairments to everyday functioning and general quality of life (Lépine et al., 2011). The primary methods of treating depression continue to be traditional therapies like psychotherapy and medication; But there's increasing proof that exercise can be a helpful addition to therapy, providing psychological and physiological advantages that help reduce the symptoms of depression (Blumenthal et al., 2023). The present review will examine how various forms of exercise, the length and intensity of physical activity, and their combined impact with therapy in the treatment of depression relate to one another. This assessment looks at

the available research to provide a comprehensive understanding of how exercise might be optimized as a therapeutic strategy for those who struggle with depression.

Type of Exercise

The type of exercise an individual performs may have an impact on exercise's effectiveness in relieving symptoms of depression (Koo & Kim, 2020, Xie et al., 2021).

Different types of physical activity can affect different regions of the body, and each type of exercise generally serves a different function.

The study titled "Effects of Physical Activity on the Stress and Suicidal Ideation in Korean Adult Women with Depressive Disorder" by Koo and Kim (2020) attempted to ascertain whether or not physical activity affects stress and suicidal ideation in women struggling with depression. The study used 1315 Korean women and used the Korean National Health and Nutrition Examination Survey to study this question. The data was collected through logistic regression, which is a type of statistical method used to reveal the probability of an outcome. Using flexibility exercises, it was revealed that flexibility combated stress and suicidal ideation significantly (Koo & Kim, 2020). Overall, this reveals how performing flexibility exercises can reduce stress as well as suicidal ideation in patients experiencing depressive symptoms (Koo & Kim, 2020). This is significant, as it reveals how performing various flexibility exercises such as yoga and stretching can be beneficial to an individual's mental health. It can spread awareness to individuals struggling with stress and suicidal ideation and give them an outlet for improving their mental well-being.

Meanwhile, the study titled "The Effects and Mechanisms of Exercise on the Treatment of Depression" (Xie et al., 2021) explored the impact of different types of exercise interventions such as mind-body, aerobic, and resistance exercises on individuals with depression. It aimed to

ascertain the effect of exercise on combating depressive symptoms, as well as the scientific and psychological mechanisms involved in that process. Analyzing a variety of different research studies and environments, individuals with depression were engaged in different exercise interventions. The types of exercises participants engaged in included aerobic exercises, running or indoor cycling, yoga, and standardized guided yoga therapy (GET)/self-organized activity (SOA), with varying durations and intensities of exercise. Through their research, the writers realized that exercise can relieve depressive symptoms (Xie et al., 2021). Exercise can improve mood and mental health as well, such as releasing endorphins, reducing inflammation, and enhancing brain functions (Xie et al., 2021). After synthesizing information from an array of different research papers, the study concludes that aerobic or mind/body exercises are the best type of exercise to relieve depression symptoms, as they were the most common interventions listed in the papers (Xie et al., 2021). This can significantly aid individuals suffering with depression in finding a way to relieve their depressive symptoms (Xie et al., 2021). This adds on to the study mentioned above, as many mind/body exercises include aspects of mindfulness and yoga, which can be related and implemented in flexibility exercises (Koo & Kim, 2020; Xie et al., 2021). However, this study adds that aerobic exercises are beneficial as well, which was not present in the first study, likely because the previous study focused specifically on flexibility exercises. Additionally, the first study mentioned flexibility exercises' effect on individuals with depression in relieving stress and suicidal ideation (Koo & Kim, 2020). However, the second study explains how aerobic and mind/body exercises can help individuals with diagnosed depression specifically, and not symptoms of depression (Xie et al., 2021). This reveals how different exercises may target different parts of depression and different mental health issues (Xie et al., 2021).

Time Spent Exercising

The time an individual spends exercising can have a major impact on respective levels of depression (Gorgula et al., 2021, Pearce et al., 2022). The first article, titled “Physical activity, physical self-perception and depression symptoms in patients with major depressive disorder: a mediation analysis” (Gorgulu et al., 2021) was a cross-sectional study that tested 76 in/outpatients struggling with Major Depressive Disorder using ActiGraph wGT3X+ accelerometers. It tracked the amount of physical activity participants would partake in using cardiopulmonary exercise testing, and determined low, moderate, and high levels of physical activity by the duration of each exercise. Low physical activity was categorized by less than 30-45 minutes of exercise daily, moderate physical activity was around 30-45 minutes of exercise daily, and high physical activity was defined by the completion of over 45 minutes of exercise daily. The authors used a Mann-Whitney U, Kruskal-Wallis test, Spearman correlation, and mediation analysis to discover the results: In outpatients, there was a negative correlation between depression [Beck-Depression-Inventory-II (BDI-II)] and moderate-to-vigorous physical activity (MVPA), and no association between inpatient MVPA and psychopathology (psychopathological tests were done to check the results of the patients’ depression). However, doing physical activity did seem to improve well-being, which proved to be beneficial for helping relieve depression (Gorgulu et al., 2021). Moreover, depression levels were higher with people who did low and moderate levels of physical activity compared to people performing high levels of physical activity, but fitness was not directly associated with depression or well-being

(Gorgulu et al., 2021). The study concluded that exercise and fitness itself did not improve depressive symptoms (Gorgulu et al., 2021). Moreover, exercise aided in individuals' well-being, which then led to decreased depressive symptoms (Gorgulu et al., 2021). Overall, this article explains that in order to combat depression, MVPA and exercise over 30 mins daily should be promoted, as it is the most effective in improving an individual's well-being (Gorgulu et al., 2021). This study was critical as it gave insights into exercise's impact on depression. It was interesting how the study revealed a greater correlation between well-being and combating depression rather than how exercise itself impacts depression (Gorgulu et al., 2021). This information can aid researchers in the future for finding new interventions for depression and learning more about mental illnesses.

Additionally, the article titled "Association Between Physical Activity and Risk of Depression" (Pearce et al., 2022) attempted to discern the dose-response association between physical activity and incident depression in adults. To do this, they used 3000 or more adults, and 2-stage random-effects dose-response meta-analysis to synthesize data. For study specific data, they used generalized least-squares regression, which is a tool used to make predictions more accurate by accounting for uneven or related errors. For pooled data, they combined study-specific coefficients, meaning they made specific adjustments for each set of data and combined the results together. As for the results, participants doing half of the recommended amount of physical activity (4.4 hrs per week of moderate exercise) had an 18% decrease in chances of depression, and participants meeting the recommended amount of physical activity (8.8 hrs per week of moderate exercise) had a 25% decrease in chances of depression; however, additional activity did not necessarily lead to a major decrease in chances of depression (Pearce et al., 2022). Overall, this study found that 11.5% of depression cases could be prevented if

individuals completed the recommended amount of physical activity, and physical activity can reduce chances of depression, especially for participants who are less familiar with physical activity (Pearce et al., 2022). Both of these studies indicate how performing at least a moderate level of exercise daily can relieve depressive symptoms (Gorgulu et al., 2021, Pearce et al., 2022). Both studies show how exercise from around 30-60 minutes per day can be beneficial (Gorgulu et al., 2021, Pearce et al., 2022). This proves to be favorable for the majority of people, as this duration of time is not a significantly large amount. 30-60 minutes of exercise can be manageable for the majority of individuals, showing how many techniques for improving mental health can be simple and accessible for many people.

Relationship Between Exercise and Therapy

The relationship between exercise and therapy in treating depression is explored in, “The role of exercise in the treatment of depression: biological underpinnings and clinical outcomes,” by (Blumenthal et al. 2023) and “The role of exercise in the treatment of depression: biological underpinnings and clinical outcomes.” (Ross et al. 2023). Blumenthal et al. (2023) emphasizes that including exercise with traditional therapies, such as cognitive-behavioral therapy (CBT), enhances treatment outcomes for depression and other mental illnesses. Exercise can complement therapy by decreasing mood swings and sadness through biological mechanisms like increased serotonin production which provides a feeling of euphoria to the human body. Alongside increased serotonin production, exercise promotes a sense of achievement and self-esteem, which helps keep the strides made in other forms of therapy seem to linger longer than normal (Blumenthal et al 2023).

Ross et al. (2023) similarly highlights that exercise acts as a helpful treatment to lowering the impact of cognitive diseases on the body, supporting the therapeutic process by improving

overall mental health and reducing symptoms of depression. The study shows that when combined with therapy, exercise can lead to longer and more permanent improvements in mood and functioning (Ross et al., 2023). For instance, regular physical activity may help patients engage more fully in therapy, reduce stress levels, and improve sleep quality, which further enhances the effectiveness of psychological interventions (Ross et al., 2023).

Both studies examine that while exercise alone can positively impact depression, its combination with therapy provides a more effective approach to treatment (Ross et al 2023). Overall, the combined effects of exercise and therapy make them a powerful aid in managing and reducing mental illnesses (Blumenthal and Ross).

Intensity of Exercise

Exercise intensity plays a crucial role on the impact of battling mental illnesses, with varying effects depending on the type and level of activity (Hu et al. 2020). According to the studies, “The effects and mechanisms of exercise on the treatment of depression. *Frontiers in Psychiatry*” (Xie et al. 2021) and “Exercise interventions for the prevention of depression: a systematic review of meta-analyses,” (Hu et al. 2020), moderate to vigorous intensity exercise tends to yield the most significant improvements in depressive symptoms. The studies highlight that high-intensity exercise is particularly effective in enhancing the production of brain-derived neurotrophic factor (BDNF), a protein that supports brain health and neuroplasticity, which are crucial for mood regulation (Hu and Xie).. This increased amount of BDNF can help control people with mental illness’ mood and more effectively communicate to them methods of treatment (Hu and Xie).

Furthermore, Hu et al. (2020) notes that while moderate-intensity exercise can be more accessible and sustainable for individuals with depression, high-intensity workouts may offer

greater benefits in reducing symptoms when performed consistently. This is because high-intensity exercise induces a stronger release of endorphins and other neurotransmitters, contributing to a more coherent mood boost (Hu 2020). However, the studies also emphasize the importance of individualizing exercise programs, as the optimal intensity can vary based on personal fitness levels, preferences, and the severity of depressive symptoms.

In conclusion, both studies support that while all forms of exercise can positively impact mental health, higher-intensity activities may offer more significant benefits for reducing depressive symptoms, particularly when personalized to each individual's capabilities and needs (Hu and Xie).

Conclusion

Exercise has been recognized as an effective method for managing and minimizing depressed symptoms, according to the reviewed literature. Exercises of all kinds, from high-intensity cardio sessions to flexibility exercises, have particular benefits that can be tailored to meet individual objectives. Furthermore, exercise's effectiveness is greatly influenced by its duration and intensity, with moderate-to-vigorous physical activity and high-intensity exercises producing the most gains in mental and emotional well-being. Importantly, combining exercise with conventional therapies like cognitive-behavioral therapy improves treatment results, indicating that exercise needs to be a fundamental part of a broad depression treatment program. Future research may further investigate the processes that drive the beneficial effects of exercise in treating depression and create customized exercise regimens that optimize these effects for those afflicted.

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