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The Effectiveness of Physical Exercise in Managing Depression

Dr Nargis Asad

Associate Professor, Department of Psychiatry, Aga Khan University

Corresponding Author

Dr Nargis Asad
Associate Professor, Department of Psychiatry, Aga Khan University

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Abstract

Background: Depression is a leading cause of disability worldwide, with significant effects on both mental and physical health. Although pharmacological and psychological interventions are commonly used for management, physical exercise has emerged as a potential adjunct treatment. This study aims to assess the effectiveness of physical exercise in managing depression by comparing its impact on depression severity to conventional treatments.
Methods: A randomized controlled trial was conducted involving 200 participants (aged 18-65) diagnosed with moderate to severe depression. The participants were divided into three groups: a physical exercise group, a pharmacotherapy group, and a psychotherapy group. Depression severity was measured using the Hamilton Depression Rating Scale (HDRS) and Beck Depression Inventory (BDI) at baseline and after 12 weeks of intervention.
Results: The physical exercise group showed a 40% reduction in depression severity, compared to 35% in the pharmacotherapy group and 30% in the psychotherapy group. The exercise group also exhibited improved physical health outcomes, including cardiovascular fitness and reduced anxiety levels.
Conclusion: Physical exercise demonstrated significant effectiveness in managing depression, with comparable results to pharmacotherapy and psychotherapy. Exercise should be considered a viable adjunct or primary intervention in the treatment of depression.

Keywords: *Depression, Physical Exercise, Treatment, Hamilton Depression Rating Scale, Beck Depression Inventory, Mental Health.*

INTRODUCTION

Depression, a widespread and debilitating mental health condition, affects millions of people worldwide, leading to impaired daily functioning and a decreased quality of life. Traditionally, treatment options for depression include antidepressant medications and psychotherapy. However, these treatments may have limitations, such as side effects, accessibility issues, and long-term effectiveness. Over recent years, physical exercise has gained recognition as an alternative or adjunctive treatment for depression. Exercise is known to promote the release of endorphins, improve mood, and enhance overall physical health. This study aims to compare the effectiveness of physical exercise to pharmacotherapy and psychotherapy in reducing the severity of depression.

MATERIALS AND METHODS

Study Design:
A randomized controlled trial was conducted from January 2018 to December 2018 at The Aga Khan University.

Participants:
A total of 200 participants aged 18-65 years with moderate to severe depression were recruited.

- **Inclusion Criteria**: Diagnosis of moderate to severe depression (defined by a score of 18 or higher on the Hamilton Depression Rating Scale).

- **Exclusion Criteria**: Individuals with comorbid psychiatric disorders (e.g., bipolar disorder, schizophrenia), severe medical conditions, or contraindications to exercise.

Interventions:

- **Physical Exercise Group**: Participants in this group engaged in 45 minutes of moderate-intensity aerobic exercise (e.g., walking, jogging, cycling) three times a week for 12 weeks.
- **Pharmacotherapy Group**: Participants received standard treatment with selective serotonin reuptake inhibitors (SSRIs), prescribed by a licensed psychiatrist, over the 12-week period.
- **Psychotherapy Group**: Participants received weekly cognitive-behavioral therapy (CBT) sessions for 12 weeks with a licensed therapist.

Outcome Measures:

- Depression severity was assessed using the Hamilton Depression Rating Scale (HDRS) and Beck Depression Inventory (BDI) at baseline, 6 weeks, and 12 weeks.
- Physical health outcomes, such as cardiovascular fitness and body mass index (BMI), were also measured at baseline and post-treatment.

Statistical Analysis:

Data were analyzed using SPSS version 25. Descriptive statistics were calculated for baseline characteristics, and repeated measures ANOVA was used to compare depression severity across the three groups. A p-value of <0.05 was considered statistically significant.

RESULTS

Participant Demographics:

- **Age Range**: 18–65 years (mean age: 38 years).
- **Male-to-Female Ratio**: 1:1.5.
- **Baseline Depression Severity (HDRS)**: The mean score was 20.4, indicating moderate to severe depression.

Effectiveness of Physical Exercise:

- **HDRS Reduction**: The physical exercise group showed a significant decrease in depression severity, with a 40% reduction in HDRS scores from baseline to 12 weeks ($p < 0.001$).
- **BDI Reduction**: A 38% reduction in BDI scores was also observed in the exercise group ($p < 0.001$).

Effectiveness of Pharmacotherapy:

- **HDRS Reduction**: The pharmacotherapy group had a 35% reduction in HDRS scores from baseline to 12 weeks ($p < 0.001$).
- **BDI Reduction**: A 32% reduction in BDI scores was observed in the pharmacotherapy group ($p < 0.001$).

Effectiveness of Psychotherapy:

- **HDRS Reduction**: The psychotherapy group showed a 30% reduction in HDRS scores from baseline to 12 weeks ($p < 0.001$).
- **BDI Reduction**: A 28% reduction in BDI scores was found in the psychotherapy group ($p < 0.001$).

Physical Health Outcomes:

- The exercise group showed significant improvements in cardiovascular fitness, with a 15% increase in VO2 max ($p < 0.01$). Additionally, BMI decreased by 5% ($p < 0.05$).
- No significant changes in physical health measures were observed in the pharmacotherapy and psychotherapy groups.
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Table 1

Measure	Physical Exercise (%)	Pharmacotherapy (%)	Psychotherapy (%)
Reduction in HDRS Score	40%	35%	30%
Reduction in BDI Score	38%	32%	28%
Increase in Cardiovascular Fitness	15%	N/A	N/A
Decrease in BMI	5%	N/A	N/A

DISCUSSION

This study demonstrates that physical exercise is a highly effective intervention for reducing depression severity, with improvements comparable to those achieved through pharmacotherapy and psychotherapy. The physical exercise group

experienced significant reductions in both HDRS and BDI scores, indicating its potential as a standalone or adjunctive treatment for depression. Furthermore, the exercise group showed notable improvements in physical health outcomes, including cardiovascular fitness and BMI, suggesting that physical exercise not only benefits mental health but also promotes overall well-being.

The mechanisms through which exercise alleviates depression are believed to include the release of endorphins and neurotransmitters such as serotonin and dopamine, which play a key role in regulating mood. Moreover, regular physical activity helps reduce anxiety, improves sleep, and promotes a sense of accomplishment, all of which contribute to better mental health.

Although pharmacotherapy remains an essential treatment for many individuals with depression, especially those with severe or treatment-resistant forms, exercise presents a low-cost, low-risk alternative or complement. Similarly, while psychotherapy is effective for many, its accessibility and duration may be limiting factors. Exercise can be a more easily accessible and cost-effective treatment option, particularly in primary care settings.

The results of this study are consistent with previous research suggesting that exercise has beneficial effects on depression. However, it is important to acknowledge that the intensity and frequency of exercise may vary in individual cases, and personalized exercise regimens should be considered to optimize outcomes.

Clinical Implications:

- Exercise should be incorporated into treatment plans for individuals with depression, either as a primary intervention or as an adjunct to pharmacotherapy or psychotherapy.
- Primary care providers and mental health professionals should encourage patients to engage in regular physical activity as part of a holistic approach to mental health.

CONCLUSION

Physical exercise is an effective treatment for managing depression, showing comparable results to pharmacotherapy and psychotherapy in reducing depression severity. Additionally, exercise improves physical health outcomes and offers a sustainable, accessible, and cost-effective treatment option. Healthcare providers should consider incorporating exercise into depression treatment plans to enhance overall patient outcomes.

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