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REVIEW ARTICLE

Effects of Physical Activity on Mental Health in Students – A Narrative Review

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ABSTRACT

Mental health problems such as anxiety, depression and stress are common among students due to academic pressure, lifestyle changes and sedentary behaviour. Objective of the study is to review and synthesize evidence regarding the role of physical activity in improving mental health outcomes in students. Literature review including experimental, observational and meta-analysis studies assessing exercise interventions and psychological outcomes. Aerobic, resistance and mind-body exercises significantly improved mood, reduced depression and anxiety, enhanced cognition and sleep. Structured physical activity programs should be integrated into educational institutions as preventive mental health strategies.

Keywords: Physical activity, Students, Depression, Anxiety, Exercise therapy

1 INTRODUCTION

Mental health problems among students have become a major public health concern. Academic pressure, social expectations, and lifestyle changes contribute to increasing levels of anxiety, depression, and psychological distress. Sedentary behaviour and prolonged screen exposure further aggravate these conditions[1-3]. Physical activity (PA) is widely recognized as a cost-effective intervention benefiting both physical and psychological health. Exercise improves mood, emotional stability, cognitive performance, and sleep quality, directly influencing academic performance and quality of life[1-5]. This review evaluates evidence regarding effectiveness, mechanisms, and optimal dosage of physical activity for improving mental health in students[2, 4, 7].

2 MATERIALS AND METHODS

This study was designed as a narrative review article aimed at synthesizing available evidence regarding the impact of

physical activity on mental health among students. Search Strategy (Fig. 1) for this structured literature search was conducted across the following electronic databases: PubMed, Scopus, Web of Science, Google Scholar. The search was performed for studies published between 2000 and 2025. Keywords and Medical Subject Headings (MeSH) terms used included: "physical activity" OR "exercise", "mental health" OR "depression" OR "anxiety" OR "stress", "students" OR "college students" OR "adolescents". These terms were combined using Boolean operators (AND, OR). Studies were included if they involved school or university students and evaluated the relationship between physical activity and mental health outcomes. Only English-language full-text articles were considered eligible for inclusion. Both observational and interventional studies assessing exercise-based interventions in student populations were reviewed. Studies were excluded if they involved animal subjects, included interventions not directly related to physical activity, or contained incomplete or insufficient data for interpretation. Articles lacking clearly defined mental health outcome measures were also excluded. Articles were screened based on title and abstract, followed by full-text review. Relevant studies meeting inclusion criteria were included for qualitative synthesis. The primary outcome measures assessed across studies included standardized psychological scales such as the Beck Depression Inventory (BDI) and Patient Health Questionnaire-9 (PHQ-9) for depression, the Generalized Anxiety Disorder-7 (GAD-7) for anxiety, and the Perceived Stress Scale (PSS) and Depression Anxiety Stress Scales (DASS) for stress assessment. In addition, cognitive performance and academic outcomes were considered where reported. The interventions reviewed included aerobic exercise, resistance training, yoga, sports participation, and structured exercise programs, as supported by previous literature[3, 5, 8]. These interventions varied in intensity, duration, and frequency, with most studies emphasizing moderate-intensity activity performed regularly over several weeks. Although a formal risk of bias tool was not applied due to the narrative nature of this review, emphasis was placed on including peer-reviewed studies, meta-analyses, and high-quality observational studies to ensure reliability of findings.

3 RESULTS

Depression and Anxiety Regular physical activity significantly reduced depression and anxiety. Aerobic exercises showed strong antidepressant effects, resistance training improved mood, and yoga reduced stress and anxiety. Regular physical activity was consistently associated with reductions in depression and anxiety across multiple studies[5-10]. Aerobic exercise demonstrated strong antidepressant effects, while resistance training and mind-body exercises such as yoga contributed to improvements in mood and stress reduction. Exercise was also associated with enhanced cognitive performance, including improvements in attention, memory, and academic outcomes[3, 8, 9].

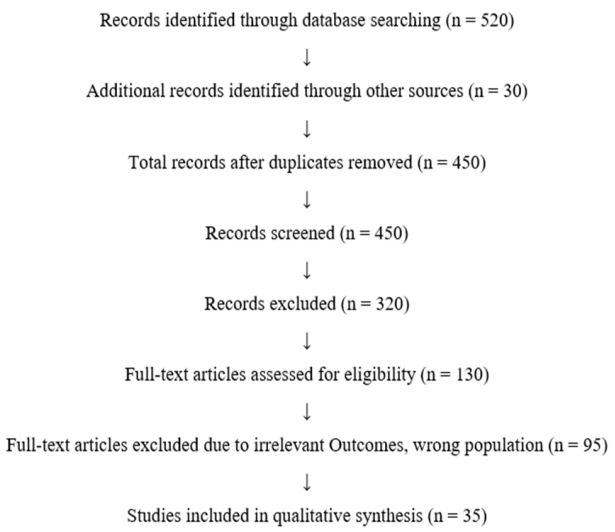


Fig. 1: PRISMA Flow Diagram

Additionally, physical activity contributed to improved emotional well-being, including better self-esteem, resilience, and social interaction. However, the magnitude of improvement varied across studies due to differences in intervention type, duration, and outcome measures. Optimal Exercise Prescription Frequency: 3–5 sessions/week Duration: 30–60 minutes Intensity: Moderate Type: Combination of aerobic, resistance, and mind-body exercises Mechanisms of Action Biological: Endorphin release, serotonin regulation, reduced cortisol, neurogenesis Psychological: Improved confidence and emotional regulation Social: Peer interaction and support networks.

4 DISCUSSION

Evidence from this review and other recent studies confirms that physical activity exerts significant positive effects on multiple mental health outcomes in student populations. For example, a recent three-level meta-analysis found that long-term exercise interventions significantly reduce symptoms of depression and anxiety among college students, supporting the dose-response relationship identified in this review[11]. A network meta-analysis also highlighted that various exercise types (aerobic, resistance, mind-body) are effective for alleviating depressive symptoms, suggesting that tailored exercise prescriptions may enhance mental health benefits[12]. Emerging research has also begun elucidating mechanisms underlying these effects. A 2025 study showed that physical exercise can reduce social anxiety in college students via positive thoughts and mental toughness pathways, indicating that psychological mediators contribute to the exercise-mental health relationship[13]. Similarly, another 2025 investigation demonstrated that emotion regulation and self-efficacy acted as mediators between physical exercise and mental health outcomes, underscoring the psychological processes engaged by regular physical activity[14]. Further research found that psychological resilience and reduced sleep problems play

significant roles in how exercise mitigates depressive symptoms, suggesting multidimensional mechanisms linking activity and mental wellness[15]. Beyond symptom reduction, physical activity appears to influence broader psychosocial functioning. Recent epidemiological work highlights that higher physical activity levels correlate with better sleep quality, lower perceived stress, and improved overall well-being among university students[16]. Additionally, cross-cultural research has shown that physical activity can buffer the negative effects of high social media use on depression and anxiety, pointing to its protective role in the digital age[17]. These findings align with traditional behavioural theories that posit exercise enhances neurochemical balance (endorphins, serotonin), improves cognitive function, and fosters social connectedness — all of which contribute to sustainable mental health improvements[8, 10]. However, the heterogeneity of study designs and measurement tools underscores the need for more longitudinal and experimental research to confirm causal pathways and optimal intervention parameters[16-20]. In summary, the growing body of contemporary evidence supports the integration of structured physical activity into student mental health strategies and highlights the importance of considering both biological and psychosocial mechanisms in future research and practice. This review highlights the need for structured and standardized exercise protocols to optimize mental health outcomes among students.

4.1 Strengths and Limitations

This review synthesizes findings from diverse study designs, including experimental and observational studies. However, the absence of a formal risk of bias assessment and heterogeneity in study methodologies may limit the strength of conclusions. Future research should incorporate standardized outcome measures and rigorous methodological designs.

5 CONCLUSION

Physical activity is an effective strategy to improve student mental health and should be integrated into institutional wellness programs. Physiotherapists can play a key role in prescribing safe and personalised exercise interventions.

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