

A multimodal Physiotherapy intervention for postural correction and psychosomatic well being in college going students

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Abstract: Background: The growing reliance on digital platforms in higher education has considerably increased sedentary habits among university students. Many students remain seated for prolonged durations, often between 8–12 hours daily, leading to postural abnormalities such as forward head posture, rounded shoulders, and spinal deviations. In addition to musculoskeletal discomfort, students frequently report psychosomatic concerns like elevated stress, fatigue, and disturbed sleep. These combined issues adversely affect both health and academic efficiency. Physiotherapy provides a comprehensive approach to manage these problems through movement-based and mind-body strategies.

Aim: To determine the effectiveness of a structured physiotherapy intervention in improving posture, alleviating musculoskeletal pain, and enhancing psychosomatic health among sedentary university students.

Methodology: A quasi-experimental pre–post design was conducted on 60 students aged 18–25 years who reported sedentary behavior (≥ 6 hours/day) along with postural complaints. Participants underwent a six-week physiotherapy program comprising postural correction exercises, core strengthening, ergonomic training, and relaxation techniques including diaphragmatic breathing and mindfulness practices. Assessments were performed at baseline and after intervention using posture analysis (photogrammetry), pain evaluation (VAS), spinal flexibility tests, stress (PSS), fatigue (FSS), sleep quality (PSQI), and overall well-being measures.

Results: Post-intervention results demonstrated marked improvement in postural alignment, including reductions in forward head posture and rounded shoulders. Musculoskeletal pain decreased by approximately 40–50%, while spinal flexibility improved by 15–20%. Psychosomatic parameters also improved, with a 30% reduction in stress levels, decreased fatigue, enhanced sleep quality, and better overall well-being. Higher adherence to the program was associated with greater improvements.

Conclusion: A well-structured physiotherapy program effectively addresses both physical and psychosomatic consequences of sedentary lifestyles in students. Incorporating such interventions within academic institutions may enhance student health, well-being, and academic performance.

Keywords: Sedentary lifestyle, posture, physiotherapy, psychosomatic health, student well-being, ergonomics

INTRODUCTION

The widespread adoption of digital technologies in higher education has significantly transformed learning environments and student engagement. Tools such as online lectures, e-learning systems, and virtual classrooms have improved accessibility and flexibility. However, these developments have also contributed to increased sedentary behavior among students. Many individuals spend extended hours sitting in classrooms, studying at home, or using digital devices for academic purposes. Studies suggest that students may remain seated for 8–12 hours daily, often without sufficient movement or breaks (Katzmarzyk et al., 2019). Such prolonged inactivity poses serious risks to both physical and psychological health.

From a musculoskeletal standpoint, prolonged sitting is associated with postural deviations including forward head posture, rounded shoulders, spinal misalignment, and anterior pelvic tilt. These alterations compromise core stability, restrict spinal mobility, and increase mechanical stress on the cervical, thoracic, and lumbar regions. As a result, students frequently experience discomfort in the neck, shoulders, and lower back. If not addressed, these issues may progress into chronic pain conditions, repetitive strain injuries, and long-term spinal degeneration (Griegel-Morris et al., 1992; Straker & Mathiassen, 2009).

Beyond physical effects, sedentary behavior is also linked to psychosomatic disturbances such as stress, anxiety, fatigue, impaired sleep, and reduced overall well-being. Evidence indicates that poor posture and limited physical activity may influence autonomic nervous system function, increasing sympathetic activity and stress responses (Choi et al., 2019). This highlights the interaction between physical posture and psychological health, where musculoskeletal strain can exacerbate mental fatigue and vice versa. These combined challenges can negatively impact cognitive performance, academic outcomes, and quality of life.

University students are particularly susceptible due to academic pressures, prolonged screen exposure, and demanding schedules. Sedentary habits formed during this stage may persist into adulthood, increasing the risk of chronic disorders and reduced productivity. Therefore, interventions targeting both physical and psychosomatic health are essential in academic settings.

Physiotherapy offers an evidence-based solution to these challenges. Conventional approaches such as postural correction, strengthening exercises, stretching routines, and ergonomic

modifications address musculoskeletal imbalances. More recently, physiotherapy has incorporated psychosomatic techniques like breathing exercises, mindfulness, and relaxation strategies to improve mental well-being. These combined interventions not only alleviate immediate symptoms but also promote long-term health and functional capacity.

Despite increased awareness, limited research has explored comprehensive physiotherapy programs that simultaneously target posture, pain, and psychosomatic outcomes in student populations. Most existing studies focus on isolated interventions rather than integrated approaches. Given the rising prevalence of sedentary lifestyles among students, there is a need for holistic strategies that combine physical, ergonomic, and psychological components.

This study aims to address this gap by evaluating a six-week structured physiotherapy program designed to improve posture, reduce discomfort, and enhance psychosomatic well-being in sedentary university students. The intervention integrates postural training, strengthening exercises, ergonomic education, and relaxation techniques to promote overall health and sustainable lifestyle changes.

AIM

To assess the effectiveness of an innovative physiotherapy program in improving posture, reducing musculoskeletal discomfort, and enhancing psychosomatic well-being among sedentary university students.

OBJECTIVES

1. To determine the prevalence and severity of postural abnormalities among sedentary students.
2. To assess the psychosomatic and functional effects of prolonged sitting, including stress, fatigue, and sleep disturbances.
3. To implement a structured physiotherapy program incorporating posture correction, strengthening, ergonomics, and relaxation strategies.
4. To evaluate the impact of the intervention on posture, pain, and psychosomatic health.
5. To encourage long-term awareness of ergonomics and active study habits.

METHODOLOGY

Study Design: A quasi-experimental pre–post intervention study conducted over six weeks.

Participants:

- Sample size: 60 students
- Age: 18–25 years

Inclusion Criteria:

- Sitting ≥ 6 hours/day
- Presence of postural discomfort, pain, or fatigue

Exclusion Criteria:

- Acute injuries or structural deformities
- Chronic neurological/systemic conditions
- Recent physiotherapy intervention

Intervention

1. Postural Correction Exercises

- Chin tucks and cervical retraction
- Thoracic extension and scapular stabilization
- Lumbar alignment and neutral spine exercises

2. Core Strengthening

- Planks, bridges, abdominal exercises
- Back extensor strengthening
- Stretching of pectorals, hamstrings, and hip flexors

3. Ergonomic Training

- Proper workstation setup

- Regular micro-breaks every 30–45 minutes
- Digital study posture guidance

4. Relaxation Techniques

- Diaphragmatic breathing
- Progressive muscle relaxation
- Mindfulness practices

Outcome Measures

Physical Parameters:

- Posture (photogrammetry, plumb line)
- Spinal flexibility
- Pain (VAS)

Psychosomatic Measures:

- Stress (PSS)
- Fatigue (FSS)
- Sleep quality (PSQI)
- Overall well-being

RESULTS

After six weeks:

Postural Changes:

- Forward head posture improved by 8–10°
- Reduced rounded shoulders
- Flexibility increased by 15–20%

Pain Reduction:

- VAS scores decreased by 40–50%
- Reduced discomfort during academic activities

Psychosomatic Outcomes:

- Stress reduced by 30%
- Improved sleep and reduced fatigue
- Enhanced well-being

Adherence:

Participants with $\geq 80\%$ compliance showed the most significant improvements.

DISCUSSION

The results demonstrate that a structured, multi-component physiotherapy program effectively improves posture, reduces musculoskeletal pain, and enhances psychosomatic health in sedentary students. These findings support the idea that physiotherapy interventions can positively influence both physical and mental health outcomes.

Recent literature highlights the detrimental effects of prolonged sitting on spinal alignment and overall health. Sedentary behavior contributes to postural deviations such as forward head posture and rounded shoulders, commonly observed in student populations. Evidence also suggests that sustained poor posture may influence autonomic regulation, increasing stress responses and reducing physiological balance.

Additionally, studies have established a strong association between sedentary lifestyles and musculoskeletal discomfort, particularly in the neck, shoulders, and lower back. High prevalence of these issues among students indicates the need for targeted interventions addressing both posture and symptom relief.

Physiotherapy interventions focusing on strengthening, mobility, and posture correction have been shown to improve functional outcomes and reduce pain. Although the effectiveness of specific methods may vary, overall evidence supports exercise-based rehabilitation in managing postural dysfunction.

Importantly, the inclusion of relaxation and mindfulness techniques in this study likely contributed to improvements in stress, fatigue, and sleep quality. Modern physiotherapy increasingly recognizes the role of mind-body approaches in enhancing psychosomatic health. Physical activity combined with relaxation strategies has been linked to improved emotional regulation and reduced anxiety.

The comprehensive nature of the intervention—integrating exercise, ergonomics, and relaxation—likely explains the significant improvements observed within a relatively short duration. Higher adherence further enhanced outcomes, emphasizing the importance of consistency.

However, limitations include a small sample size and reliance on self-reported psychosomatic measures, which may introduce bias. Additionally, long-term sustainability was not assessed, highlighting the need for extended follow-up studies.

Overall, this study reinforces the importance of addressing sedentary behavior through holistic physiotherapy interventions, particularly in academic settings.

LIMITATIONS

- Limited sample size
- Subjective psychosomatic assessments
- Short intervention duration

CONCLUSION

A comprehensive physiotherapy program integrating postural correction, strengthening exercises, ergonomic education, and relaxation techniques is effective in reducing the adverse effects of sedentary lifestyles among students. Implementing such programs in universities can improve physical health, mental well-being, and academic performance.

CLINICAL IMPLICATIONS

- Early identification of postural issues is essential
- Physiotherapy can be included in student wellness initiatives
- Ergonomic awareness should be promoted

- Preventive strategies may reduce long-term health risks

SCOPE OF STUDY

- Applicable to young adults and sedentary workers
- Future studies can incorporate wearable technology
- Long-term interventions can assess habit formation
- Integration with mental health programs may enhance outcomes

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