Impact of Physical Activity and Exercise therapy on Posture, Sedentary Behavior and Psychosomatic well-being among students in the digital age.

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Abstract: Background: Increased screen time and reduced physical activity linked to various psychosomatic issues such as Stress, Anxiety, Fatigue and Sleep Disturbances; there is lack of awareness among students regarding the importance of regular physical activity, posture correction and ergonomic practices.**Aim**:To determine impact of physical activity and exercise therapy on posture, sedentary behavior and psychosomatic well-being among students in the digital age.**Methodology**: Pre-test Post-test Experimental study in UG and PG students and Purposive sampling is done. History of any musculoskeletal conditions, neurological condition and taking physiotherapy treatment are excluded.**Results**: Statistical analysis was done using Jamovi 2.6.26 software, and Microsoft Word and Excel have been used to generate graphs and tables.The study showed significant impact of exercise therapy and physical activity on posture,sedentary behavior and psychosomatic well-being among students in the digital age.**Conclusion**:The present study demonstrates that structured physical activity and exercise therapy have a significant positive impact on posture, sedentary behavior, and psychosomatic well-being among students in the digital age.

Keywords: Physical activity, Exercise therapy, Digital Age students, sedentary behavior, psychosomatic behavior.

INTRODUCTION

The digital age has revolutionized education by enabling access to information through computers, tablets, and smartphones. However, this shift has also led to increased sedentary

behavior among students. Prolonged sitting, poor ergonomic practices, and excessive screen time contribute to postural abnormalities such as forward head posture, rounded shoulders, and spinal misalignment.

In addition to physical concerns, sedentary lifestyles are closely linked to psychosomatic issues, including stress, anxiety, fatigue, and decreased overall well-being. Exercise therapy and regular physical activity have been widely recognized as effective interventions for improving both physical and psychological health.

This study aims to examine how structured physical activity and exercise therapy influence posture, sedentary behavior, and psychosomatic well-being among students in the digital era.

NEED FOR THE STUDY

The rapid digitalization of education and lifestyle has drastically altered the daily routines of students, leading to increased dependence on electronic devices such as laptops, smart phones, and tablets. While these technologies enhance learning accessibility and efficiency, they have simultaneously contributed to a significant rise in sedentary behavior. Students now spend prolonged hours in static postures, often with poor ergonomics, which predisposes them to various musculoskeletal problems, including neck pain, back pain, and postural deviations.

In addition to physical health concerns, excessive screen time and reduced physical activity have been linked to psychosomatic issues such as stress, anxiety, fatigue, and decreased emotional well-being. The coexistence of physical discomfort and psychological distress highlights the growing burden of lifestyle-related health issues among students in the digital age.

Although previous studies have examined either physical inactivity or mental health independently, there is a lack of comprehensive research addressing the combined effects of physical activity and exercise therapy on posture, sedentary behavior, and psychosomatic well-being within a single framework. Furthermore, many existing interventions focus primarily on general fitness rather than targeted exercise therapy aimed at correcting posture and reducing sedentary habits.

Therefore this study will identify the relationship between physical activity, sedentary lifestyle, posture and mental health and will evaluate the effectiveness of structured exercise therapy program to promote the awareness about healthy digital habits and ergonomic practices.

Aim: To determine impact of physical activity and exercise therapy on posture, sedentary behavior and psychosomatic well being among students in the digital age.

Objectives:

- To assess the level of physical activity with IPAQ
- To evaluate postural deviations associated with prolonged digital device using RULA
- To measure the sedentary behavior and screen time among students by Sedentary Behavior Questionnaire
- To assess psychosomatic well being using Perceived Stress Scale, Depression Anxiety scale, Pittsburgh Sleep Quality Index
- To determine the effect of exercise therapy program on posture and psychosomatic health

Hypothesis:

Null Hypothesis: There is no significant impact of physical activity and exercise therapy on posture, sedentary behavior and psychosomatic well being among students in digital age.

Alternate Hypothesis: There is significant impact of physical activity and exercise therapy on posture, sedentary behavior and psychosomatic well being among students in digital age.

METHODOLOGY

- **Study Design**: Pre-test Post-test Experimental study
- **Study Settings**: LTCOP
- **Study Population**: UG and PG students
- **Sample size**: 150 students Calculated using GPower 3.1 software ; With 15% attrition rate.
- **Sampling method**: Purposive sampling
- **Inclusion Criteria**: 1. Age 18-26 years; 2. Using digital devices more than 3 hours
- **Exclusion Criteria**:1. History of musculoskeletal injury or spinal deformity; 2. Neurological disorders; 3. Taking any physiotherapy treatment

Outcome measures:

- For Physical Activity: IPAQ
- For Sedentary Behavior: Sedentary behavior Questionnaire
- For Posture Assessment: RULA
- For Psychosomatic well being: Perceived Stress Scale, Depression Anxiety scale, Pittsburgh Sleep Quality Index

Intervention:

A 6 week protocol for 3 days/week was given. The protocol was consisted of 45-55 minutes. The warm up consisted of general body movements for 5 minutes given followed by stretching exercises(Upper body stretching as well as Lower body stretching) and is given for 10 minutes(30 seconds hold 3 reps), strengthening exercises (plank 3sets of 10 seconds hold , bird dog 3 sets of 10 reps, glute bridges 3 sets of 12 reps, resistance band exercises for Upper and Lower limb 3 sets of 12 reps, superman exercises 3 sets of 12 reps) and for progression the reps and hold time was increased every 2 weeks. Postural correction exercises (Chin tucks, shoulder retraction, core activation, pelvic tilts of 12 reps and 3 sets), egonomic education included: Proper sitting posture (neutral spine alignment),Screen positioning at eye level Chair and desk ergonomics,Use of lumbar support, Safe smartphone usage (avoiding prolonged neck flexion) and for cool down breathing exercises were given.

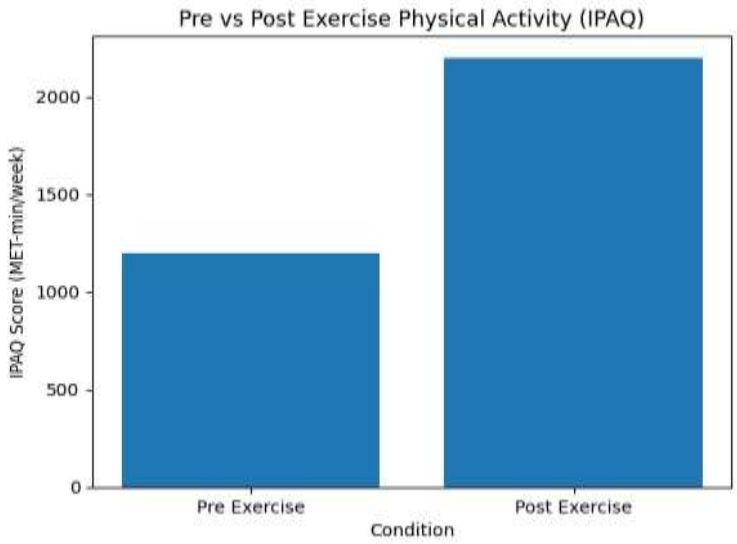
RESULTS

Statistical analysis was done using Jamovi 2.6.26 software, and Microsoft Word and Excel have been used to generate graphs and tables. As the data for muscle strength was not normally distributed, a non-parametric test (Wilcoxon rank) was used to assess pre- and post-results within the group.Level of significance was set at $p< 0.05$ with confidence interval 95%.

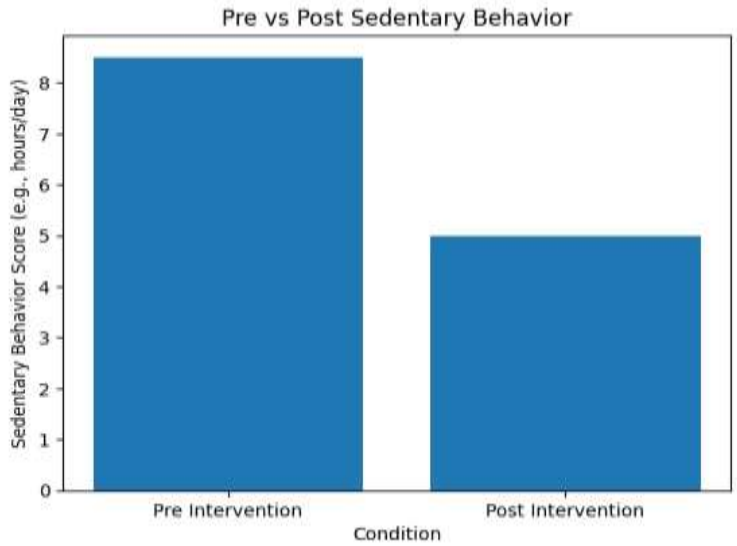
Table 1 shows the variables like age and gender which participated in the study which included 150 students with males(48 students 32%) and females (102 students 68%) and the mean age is 22 ± 4

Variable	Number
Age	22±4
Gender	Male:48 (32%) Female:102 (68%)

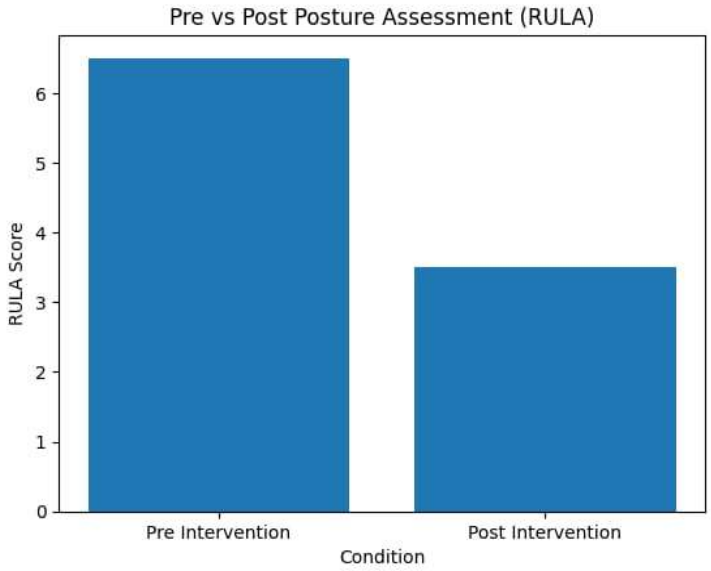
Graph 1 showing pre and post exercise physical activity of the participants where there is significant positive effect of exercises.



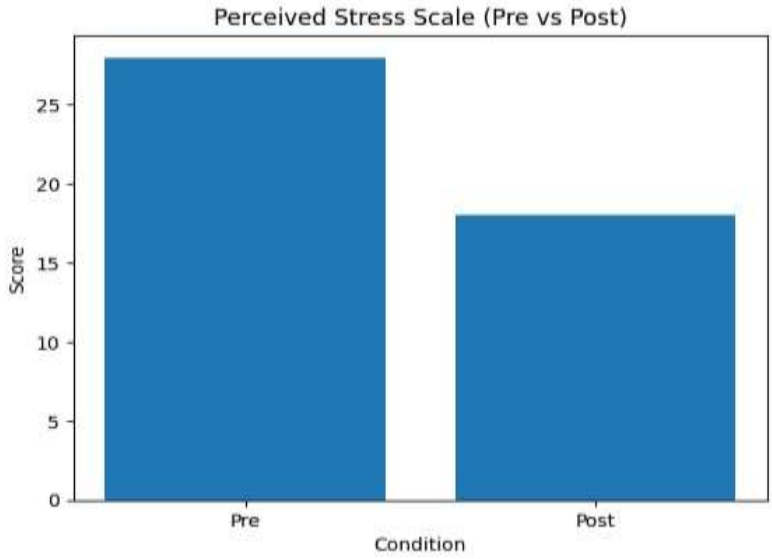
Graph 2 showing significant positive effect of Pre and post exercises on sedentary behavior of the participants



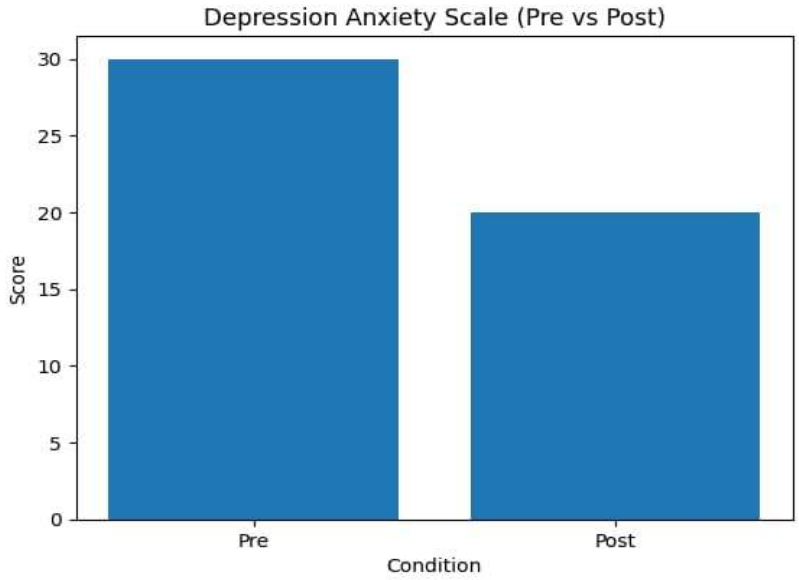
Graph 3 showing significant positive effect of exercises on posture of the participants.



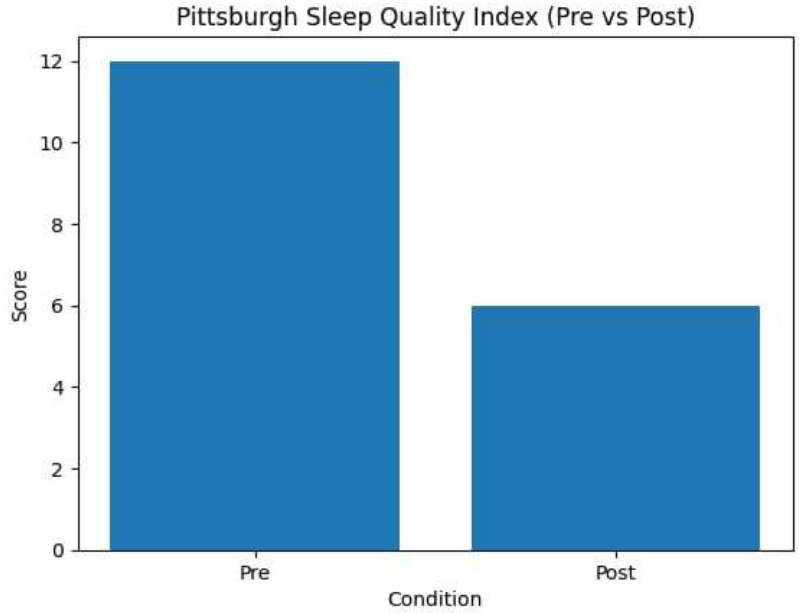
Graph 4 shows pre and post exercises results on stress levels of the participants



Graph 5 shows pre post exercises effect on depression and anxiety of the participants



Graph 6 shows significant positive effect on sleep quality of the participants



DISCUSSION

The current study showed significant positive results creating a strong relationship between physical activity and exercise therapy with student's posture, sedentary behavior and psychosomatic well being. Only physical activity alone may not completely correct postural deviations, it plays a contributory role when combined with targeted exercise intervention such as postural correction and flexibility exercises. (Salsali et al. 2023). The results align with existing evidence suggesting that prolonged screen exposure leads to musculoskeletal imbalances due to sustained static postures. The incorporation of exercises such as chin tucks,

scapular retraction, and thoracic extension likely contributed to restoring muscular balance and improving neuromuscular control. Additionally, postural awareness training played a crucial role in reinforcing correct alignment during daily activities, suggesting that behavioral modification is as important as physical intervention. School based interventions that interrupt prolonged sitting with physical activity have found to be significantly improving activity levels and reduce sedentary time. (Carrasco-Uribarren et al. 2023). In the digital age, students often engage in prolonged sitting due to academic demands and recreational screen use. The intervention's emphasis on breaking sitting time every 30–45 minutes and incorporating light physical activity proved effective in modifying these habits. This supports the growing body of research indicating that interrupting sedentary behavior, even with low-intensity activity, has significant health benefits. Behavioral strategies such as activity logs and regular reminders likely enhanced adherence and self-awareness, leading to sustainable lifestyle changes. This finding highlights that reducing sedentary behavior requires not only physical interventions but also consistent behavioral reinforcement. Engaging in regular physical activity promotes neurobiological changes, such as improved brain function and endorphin release which contribute to better mood regulation and cognitive functioning. (Zahra et al. 2022). Exercise is known to stimulate the release of endorphins and improve neurotransmitter regulation, which contributes to stress reduction and emotional stability. Furthermore, improved posture itself may have indirectly influenced psychological well-being. Research suggests that upright posture is associated with increased confidence, reduced fatigue, and better emotional regulation.The inclusion of breathing exercises and relaxation techniques further supported mental health improvements. These practices likely helped regulate the autonomic nervous system, reducing physiological stress responses and promoting relaxation. This bidirectional relationship emphasizes the need for holistic interventions that address both physical and mental aspects of health. The findings suggest that exercise therapy should not be viewed solely as a physical rehabilitation tool but also as an effective strategy for improving overall well-being. Unlike general physical activity, the targeted nature of exercise therapy allows for correction of specific postural deviations and musculoskeletal imbalances. When combined with ergonomic education and behavioral strategies, it provides a comprehensive approach to managing the health risks associated with digital lifestyles.

CONCLUSION

The present study demonstrates that structured physical activity and exercise therapy have a significant positive impact on posture, sedentary behavior, and psychosomatic well-being among students in the digital age. Therefore, incorporating structured exercise therapy programs into students' daily routines or academic settings can serve as an effective preventive and therapeutic strategy to address posture-related issues and psychosomatic disturbances associated with modern digital lifestyles.

LIMITATION

There was lack of time therefore short duration of intervention was given.

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