



The Effectiveness Of Ergonomic Interventions In Reducing Neck Pain And Improving Head And Neck Posture Among College Students

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ABSTRACT

Background: The prevalence of neck pain among college students is a growing concern, often attributed to poor posture and prolonged use of digital devices (1). This study investigates the effectiveness of ergonomic advice on improving head and neck angles and reducing neck pain in students.

Objective: To assess the effectiveness of ergonomic interventions in improving posture and reducing neck pain among college students.

Methods: The study utilized an experimental design with 30 participants, divided into an experimental group and a control group. The experimental group underwent weekly ergonomic training over two months, focusing on proper desk setup, monitor positioning, and the importance of frequent breaks. The control group received no intervention. Data were collected using the Visual Analogue Scale (VAS) for neck pain and goniometric measurements to evaluate head and neck angles, both before and after the intervention. Statistical analysis was performed using SPSS (2,3).

Results: The experimental group showed a significant improvement in head and neck angles, with a mean reduction of -6.8° ($p < 0.01$), and a decrease in VAS scores for neck pain, averaging -3.2 ($p < 0.01$). The control group did not exhibit significant changes in either head and neck angles ($p = 0.78$) or VAS scores ($p = 0.62$).

Conclusion: Ergonomic interventions were effective in improving head and neck posture and reducing neck pain among college students. These findings underscore the importance of incorporating ergonomic education and practices in academic settings to promote student health and well-being.

Keywords: Ergonomics, neck pain, head and neck posture, college students, ergonomic intervention, Visual Analogue Scale, goniometer, digital devices, musculoskeletal health.

INTRODUCTION

BACKGROUND:

Neck pain is increasingly prevalent among college students, often resulting from prolonged use of digital devices and poor posture (4,9). As students spend extensive time studying and using technology, they are at heightened risk of developing musculoskeletal disorders, particularly neck pain. This issue not only affects their physical health but also has implications for academic performance and overall quality of life (5,7).

RATIONALE:

Despite the widespread use of digital devices in academic settings, there is a lack of awareness and application of ergonomic principles among students (6,8,11). This study aims to address this gap by investigating the effectiveness of ergonomic interventions in reducing neck pain and improving posture (10).

OBJECTIVES:

The primary objective of this study is to assess the impact of ergonomic training on head and neck angles and the severity of neck pain among college students. The study also aims to highlight the importance of ergonomic education in promoting student health.

METHODS STUDY

DESIGN:

This study employed an experimental design involving 30 college students. Participants were randomly assigned to either the experimental group or the control group, with 15 students in each group.

PARTICIPANTS:

The participants were college students aged between 18 and 24 years. The demographic breakdown included an equal distribution of gender and academic disciplines, with participants from both medical and engineering fields.

INTERVENTION:

The experimental group received weekly ergonomic training sessions over two months. The training covered key aspects of ergonomics, such as proper desk and chair setup, monitor positioning, and the importance of taking frequent breaks to reduce muscle strain. The control group did not receive any intervention during the study period.

DATA COLLECTION:

Data were collected using two primary tools:

Visual Analogue Scale (VAS): Used to measure the intensity of neck pain before and after the intervention.

Goniometric Measurements: Employed to assess head and neck angles, providing a quantitative measure

of posture improvement.

STATISTICAL ANALYSIS:

Data were analyzed using SPSS software. Paired t-tests were conducted to compare pre- and post-intervention results within each group, and independent t-tests were used to compare the differences between the experimental and control groups.

RESULTS

DEMOGRAPHIC INFORMATION:

The participants' demographic details are summarized in Table 1. Both groups were comparable in terms of age, gender distribution, academic discipline, and year of study.

Table 1: Demographic Characteristics of Participants

Demographic Variable	Experimental Group (n=15)	Control Group (n=15)	Total (n=30)
Age (years)	20.4 ± 1.8	21.0 ± 1.6	20.7 ± 1.7
Gender			
Male	7	8	15
Female	8	7	15
Academic Discipline			
Medical	7	8	15
Engineering	8	7	15
Year of Study			
First Year	5	6	11
Second Year	6	5	11
Third Year	4	4	8

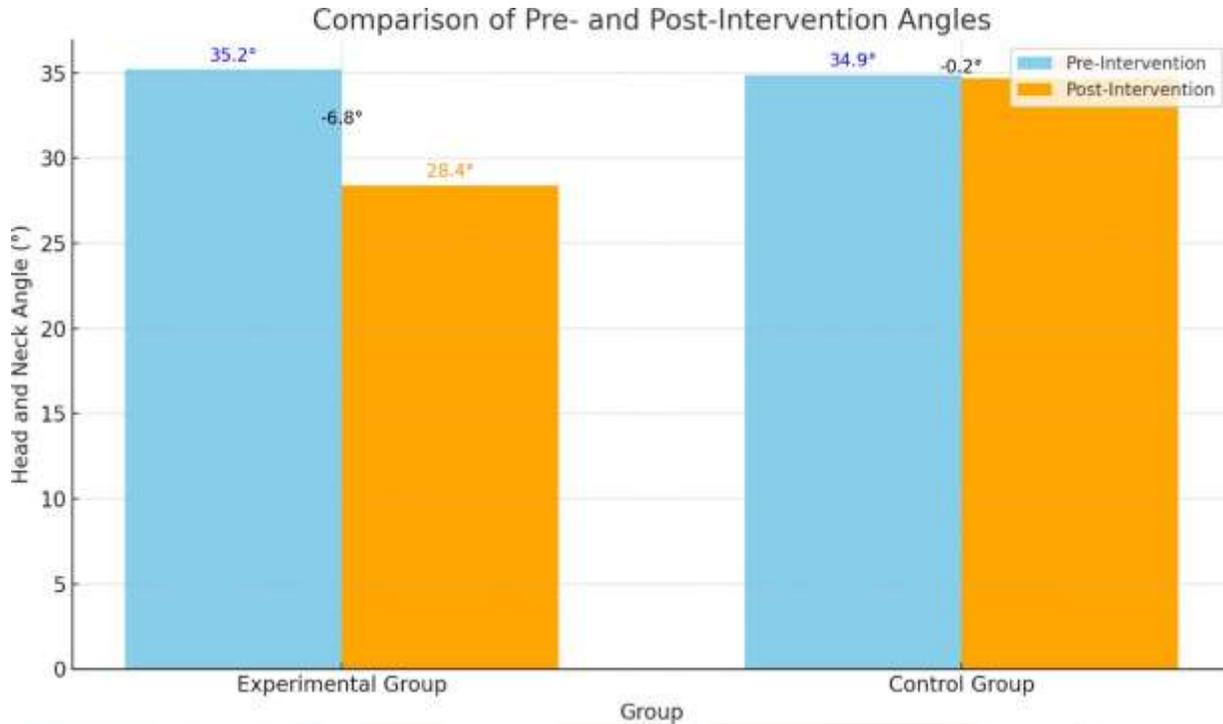
COMPARISON OF PRE- AND POST-INTERVENTION ANGLES:

The experimental group exhibited a significant reduction in head and neck angles post-intervention, with a mean difference of -6.8° ($p < 0.01$). The control group, however, showed no significant change ($p = 0.78$).

Table 2: Comparison of Pre- and Post-Intervention Angles

Group	Pre-Intervention ($^\circ$)	Post-Intervention ($^\circ$)	Mean Difference ($^\circ$)	p-value
Experimental Group	35.2 ± 5.1	28.4 ± 4.3	-6.8	<0.01

Control Group	34.9 ± 4.9	34.7 ± 5.0	-0.2	0.78
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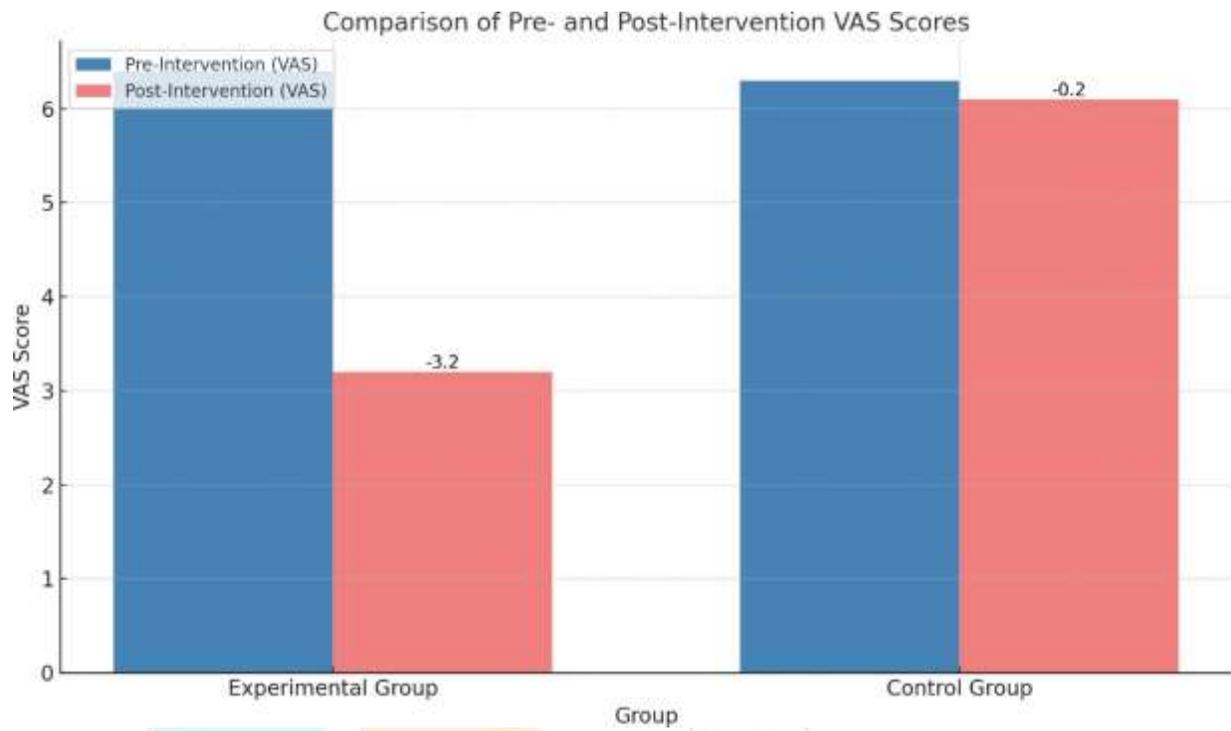


COMPARISON OF PRE- AND POST-INTERVENTION VAS SCORES:

VAS scores for neck pain decreased significantly in the experimental group, with a mean reduction of -3.2 (p < 0.01). The control group did not experience a significant change in VAS scores (p = 0.62).

Table 3: Comparison of Pre- and Post-Intervention VAS Scores

Group	Pre-Intervention (VAS)	Post-Intervention (VAS)	Mean Difference	p-value
Experimental Group	6.4 ± 1.2	3.2 ± 1.1	-3.2	<0.01
Control Group	6.3 ± 1.1	6.1 ± 1.0	-0.2	0.62



DISCUSSION

INTERPRETATION OF RESULTS:

The results of this study indicate that ergonomic interventions are effective in improving posture and reducing neck pain among college students. The significant reduction in head and neck angles, along with the decrease in VAS scores, suggests that the training provided to the experimental group successfully addressed the key factors contributing to neck pain.

Comparison with Other Studies:

The findings of this study align with previous research, which has demonstrated the positive impact of ergonomic interventions on musculoskeletal health (12). Similar studies have reported improvements in posture and reductions in pain following ergonomic training, particularly in settings where individuals are prone to poor posture due to prolonged sitting and device usage (13,14).

Implications:

These results have important implications for educational institutions. Incorporating ergonomic education and training into the curriculum can help prevent musculoskeletal disorders among students, promoting not only their physical health but also their academic performance and overall well-being (13).

LIMITATIONS:

The study has some limitations, including the small sample size and the short duration of the intervention. Future research should consider larger sample sizes and longer follow-up periods to assess the long-term effects of ergonomic interventions.

FUTURE RESEARCH:

Further studies should explore the effectiveness of different types of ergonomic interventions, such as personalized assessments and the use of ergonomic accessories, in diverse student populations. Additionally, research on the long-term benefits of ergonomic education could provide valuable insights

into its role in preventing musculoskeletal disorders.

CONCLUSION

SUMMARY:

This study demonstrates that ergonomic interventions are effective in improving head and neck posture and reducing neck pain among college students. The findings highlight the importance of ergonomic education in promoting student health and preventing musculoskeletal disorders.

RECOMMENDATIONS:

Educational institutions should consider implementing ergonomic training programs as part of their student health initiatives. By educating students on the importance of proper posture and ergonomic practices, colleges can help reduce the prevalence of neck pain and related issues.

FINAL THOUGHTS:

The integration of ergonomic education into academic settings is a proactive approach to addressing the growing concern of neck pain among students. By promoting healthy habits early on, institutions can contribute to the long-term well-being of their students.

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