

Prevalence and distribution of musculoskeletal symptoms among frequent computer users

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Abstract

The usage of computers in workplaces, educational institutions and social media is rapidly growing. Continuous use has been linked to development of musculoskeletal symptoms (MSS). This may negatively affect daily functioning, productivity and well-being. The main goal of this prospective study was to determine the prevalence of musculoskeletal issues in frequent computer users. 382 people who regularly use computers between the age of 18 and 65 were chosen from Pathanamthitta district of Kerala for the study. Participants include students and office workers who use computers regularly. Pregnant ladies and those with pre-existing musculoskeletal disorders were excluded from the study. Data were gathered using a pre-designed questionnaire on Google Forms and then entered into Microsoft Excel for analysis. Of the 382 participants, 53% were men and 47% were women. 87% of individuals reported MSS, with females having higher prevalence. Neck, shoulder, upper back and lower back were the most affected region. The study emphasizes the importance of detection and prevention strategies to reduce the discomfort and improve quality of life.

Keywords: Musculoskeletal symptoms; Prevalence; Computer users; Pathanamthitta district

1. Introduction

The widespread integration of computers into educational and professional environments has fundamentally transformed modern life. College students and office workers spend long hours in front of screens. They often sit still and perform repetitive tasks. While these technological advancements have enhanced efficiency, they have introduced significant health challenges, most notably musculoskeletal symptoms (MSS) ¹⁻⁴. Work-Related Musculoskeletal Symptoms (WRMSS) are among the most common occupational health problems affecting computer

users, resulting from prolonged static postures, repetitive movements, and inadequate ergonomic practices. ^{1,3,13} Musculoskeletal symptoms include pain or discomfort in areas like the neck, shoulders, back, and arms. ^{5, 16} Sitting for too long, poor ergonomic setups, repetitive keyboard and mouse use, and not taking enough breaks contribute to these symptoms. ^{1, 9, 13} If left unaddressed, musculoskeletal discomfort can lead to functional limitations, diminished productivity, and a poorer quality of life. ^{18, 20} The rise of musculoskeletal symptoms among computer users is a growing public health issue. ^{1, 19} This study aimed to find out the prevalence of musculoskeletal symptoms among frequent computer users in Pathanamthitta district and to describe their distribution by age, gender, and body region.

Objective

The objective of the study was to determine the prevalence and distribution of musculoskeletal symptoms (MSS) among frequent computer users in Pathanamthitta district, Kerala.

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2. Materials and methodology

A community-based prospective study was conducted in Pathanamthitta district, Kerala, over a period of 6 months from December 2024 to May 2025. A total of 382 participants were included, with the sample size calculated using the formula $N = 4PQ / d^2$, where N represents the required sample size, P is the prevalence obtained from the pilot study, Q is $100 - P$, and d is the allowable error (5–20% of P). Ethical approval for the study was obtained from the Institutional Review Board of Nazareth College of Pharmacy, Othara, Thiruvalla. Individuals aged between 18 and 65 years, including college students and office workers who regularly used computers, were included in the study. Non-computer users, individuals with pre-existing musculoskeletal disorders, those with a history of musculoskeletal surgery or injury, pregnant women, and individuals unwilling to participate were excluded from the study. A pre-designed data collection questionnaire was used as the study tool. Initially, a pilot study was conducted at Nazareth College of Pharmacy to assess the feasibility of the study using the questionnaire. Participants meeting the inclusion and exclusion criteria were enrolled, and the findings of the pilot study were evaluated before proceeding with the community survey. Following confirmation of feasibility, a community-based survey was conducted, during which participants were provided with a brief introduction to the study and assured of the confidentiality of their information. Data were collected through both printed questionnaires and Google Forms, after which brief verbal awareness regarding the prevention of musculoskeletal disorders and ergonomic practices was provided. The collected data were entered and statistically analyzed using Microsoft Excel 2021, and the results were presented in the form of tables, charts, and percentages.

3. Result

The study aimed to obtain data and to assess the prevalence of musculoskeletal symptoms in frequent computer users. This was a prospective study conducted in colleges and offices of Pathanamthitta district.

3.1. Overall prevalence of musculoskeletal symptoms

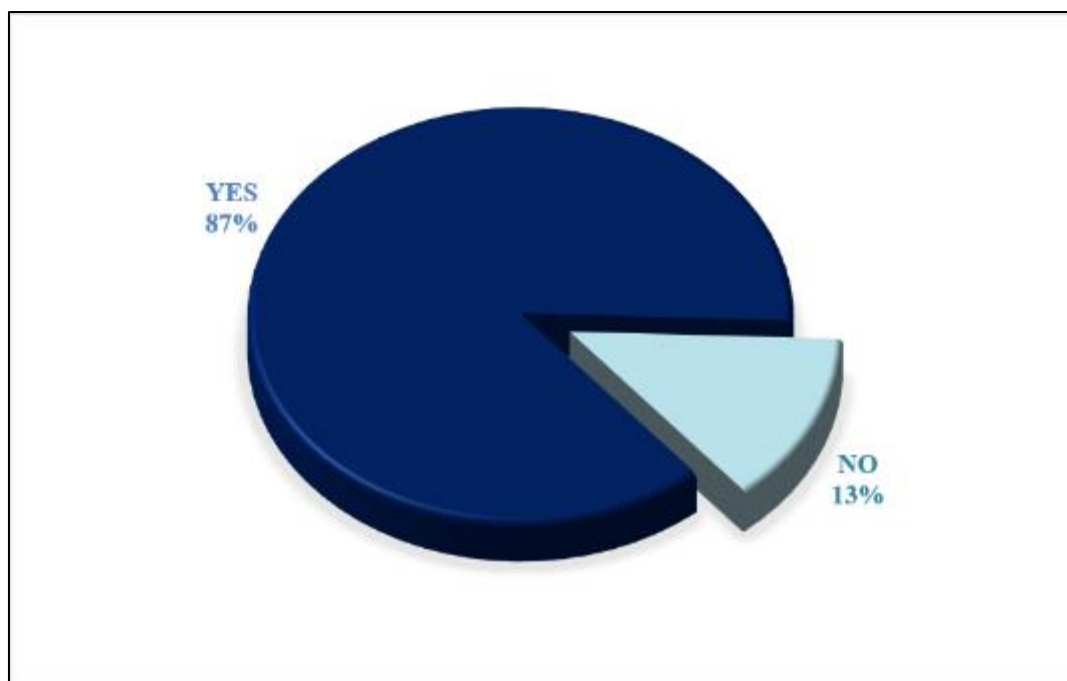


Figure 1 Overall prevalence of MSS

The overall prevalence of musculoskeletal symptoms among frequent computer users is presented in Figure 1. Out of 382 participants, 331 subjects (87%) reported the presence of musculoskeletal symptoms, while 51 subjects (13%) did not report any symptoms. These findings indicate that musculoskeletal symptoms are common among individuals engaged in frequent computer use.

3.2. Prevalence of musculoskeletal symptoms according to age group

Table 1 Prevalence of MSS according to age group

Sl. No.	AGE GROUP	YES	(n = 331)	NO	(n=51)
		Frequency	Percentage (%)	Frequency	Percentage (%)
1	18-27	226	68.28	37	72.55
2	28-37	58	17.52	4	7.84
3	38-47	35	10.57	6	11.76
4	48-57	8	2.42	3	5.88
5	58-67	4	1.21	1	1.96

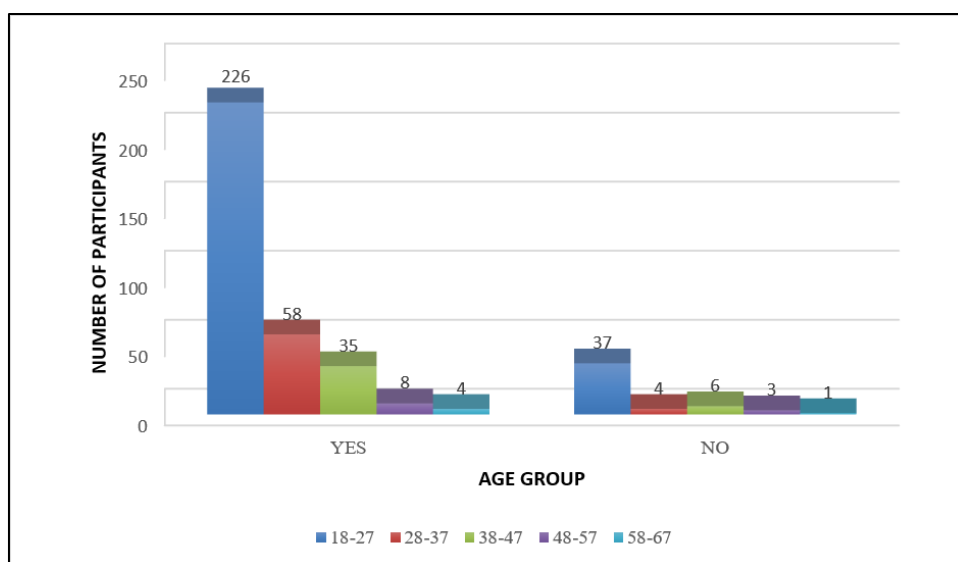


Figure 2 Prevalence of MSS by age group

The Table 1 and Figure 2 show the distribution of musculoskeletal symptoms across different age groups. The highest prevalence was observed in the 18–27 age group (68%), followed by 28–37 age group (18%). The lowest prevalence was noted in the 58–67 age group (1%).

3.3. Prevalence of musculoskeletal symptoms according to gender

Table 2 Prevalence of MSS according to gender

Sl. No.	MSS	MALE (n = 201)		FEMALE (n=181)	
		Frequency	Percentage (%)	Frequency	Percentage (%)
1	YES	162	81	169	93
2	NO	39	19	12	7

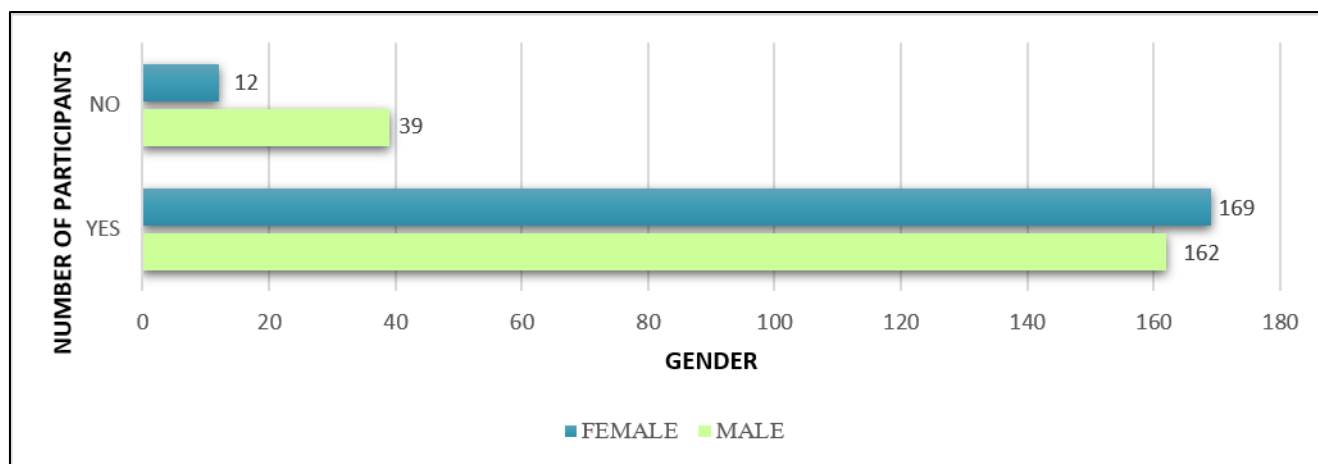


Figure 3 Prevalence of MSS by gender

The gender wise prevalence of musculoskeletal symptoms is presented in Table 2 and Figure 3. It shows that 382 participants comprised of 201 males and 181 females. The prevalence of MSS was found to be higher in females (93%) compared to males (81%). Among male participants, 162 experienced MSS, while 39 did not. In contrast, 169 females experienced MSS, while 12 did not.

3.4. Distribution of Musculoskeletal symptoms by body region

Table 3 Distribution of pain in body region

Sl. No.	Body region	Frequency	Percentage (%)
1	NECK	210	26.18
2	SHOULDER	154	19.20
3	UPPER BACK	91	11.35
4	LOWER BACK	152	18.95
5	HANDS/WRIST	64	7.98
6	ELBOWS	9	1.12
7	HIPS/THIGHS	25	3.12
8	KNEES	23	2.87
9	ANKLES/FEET	23	2.87
10	NOWHERE	51	6.36
	TOTAL	802	100

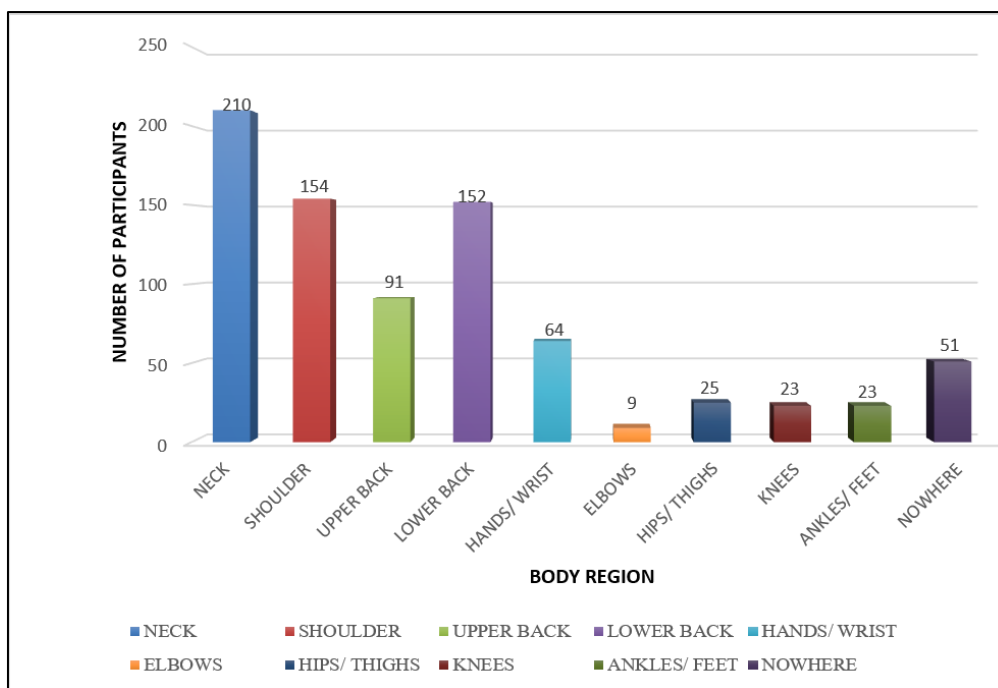


Figure 4 Distribution of pain by body region

Table 3 and Figure 4 illustrate the distribution of musculoskeletal symptoms across various anatomical regions. The above graph reveals that the most commonly affected body region was neck with 210 subjects (26%) then, shoulders (19%), lower back (19%), the upper back (11%), and hands/wrists (8%), while fewer individuals reported pain in hips/thighs (3%), knees (3%), ankles/feet (3%), and elbows (1%). Whereas 6% of subjects reported pain nowhere.

4. Discussion

The present community-based prospective study assessed the prevalence of musculoskeletal symptoms among frequent computer users in Pathanamthitta district. The study identifies a remarkably high prevalence of musculoskeletal symptoms (MSS) among frequent computer users. Out of 382 participants, 331 subjects (87%) reported the presence of musculoskeletal symptoms, while 51 subjects (13%) did not report any symptoms. The high prevalence observed may be attributed to prolonged computer exposure, sustained static posture, repetitive movements, and inadequate ergonomic awareness^{1,3,9}. Continuous screen-based activities often result in strain on the cervical spine, shoulders, and lumbar region, leading to discomfort over time^{1,13,17}.

Age-wise analysis showed that the highest prevalence was observed in the 18–27 years' age group (68%). This likely reflects the intensive screen demands for online learning and recreational screen time¹². Although lower prevalence was observed in older age groups, musculoskeletal symptoms were present across all age categories¹⁶. Females demonstrated higher prevalence of musculoskeletal symptoms (93%) than males (81%). This difference may be influenced by physiological factors, posture patterns, or variations in ergonomic practices^{9,17}. However, musculoskeletal symptoms were common in both genders, emphasizing that the issue affects the entire computer-using population^{7,16}. With respect to anatomical distribution, the neck was the most commonly affected region (26%), followed by shoulders (19%) and lower back (19%). These regions are particularly vulnerable due to forward head posture, rounded shoulders, and prolonged sitting^{11,16,17}. The upper back, hands/wrists, and other lower extremity regions were less frequently affected but still present in a notable proportion of participants^{5,16}. Overall, the findings highlight the substantial burden of musculoskeletal symptoms among frequent computer users and highlights an urgent need for targeted ergonomic education and preventive public health interventions^{14,15,19}.

Abbreviations

- MSS: Musculoskeletal symptoms
- WRMSS: Work-Related Musculoskeletal Symptoms

5. Conclusion

This study demonstrates a high prevalence (87%) of musculoskeletal symptoms among frequent computer users in Pathanamthitta district. These symptoms were found to be more prevalent among younger individuals and females, primarily affecting neck, shoulders, lower back, the upper back, and hands/wrists. These findings emphasize the need for preventive strategies such as ergonomic workplace modifications, posture correction, regular breaks, and awareness programs to reduce the burden of musculoskeletal discomfort. It is crucial to implement early interventions and encourage healthy practices when using computers to avoid long term musculoskeletal issues in frequent users.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

The authors certify that they have obtained consent from the participants in this study and their details will be concealed with due effort.

Statement of Ethical approval

Ethical approval for the study was obtained from the Institutional Review Board of Nazareth College of Pharmacy, Othara, Thiruvalla, Kerala, India.

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