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Prevalence of Neck Pain and Device Use Among Medical Students at Sriwijaya University

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Abstract

Prolonged use of electronic devices and nonergonomic working posture have been investigated as potential factors associated with neck pain. This study examined the associations of working posture and device-use duration with neck pain among medical students at Sriwijaya University. This analytical cross-sectional study included 102 medical students selected by simple random sampling. Device-use duration and neck-pain complaints were assessed using a questionnaire. Working posture was evaluated using photographs and the Rapid Upper Limb Assessment (RULA). Descriptive and bivariate statistical analyses were performed. Neck pain was reported by 90 students (88.2%). A total of 96 students (94.1%) were classified as having medium-risk working posture, and 100 students (98.0%) reported using devices for more than 2 hours. No statistically significant association was observed between working posture and neck pain ($p = 0.357$) or between device-use duration and neck pain ($p = 1.000$). Neck pain was common among the medical students studied; however, neither working-posture risk category nor duration of device use was significantly associated with neck pain.

Keywords: Neck Pain, Posture, Device Use

1. Introduction

Electronic devices, including computers, smartphones, laptops, and tablets, have become widely used across age groups. Device use is particularly common among students aged 15-24 years.[1] Previous research has reported daily device use of at least 5.5 hours.[2] Electronic devices are routinely used to access educational materials and online learning resources.[3] These academic demands may increase the duration and frequency of device use.[2] Prolonged use with nonergonomic positioning may contribute to musculoskeletal discomfort, including neck pain.

The International Association for the Study of Pain (IASP) describes neck pain as pain in the cervical region extending toward the first thoracic spinous process.[4] Reported global prevalence estimates range from 16.7% to 75.1%.[5] The World Health Organization has identified neck pain as a major musculoskeletal problem, with approximately 222 million people affected worldwide.[6] An Indonesian report described a 16.6% increase in neck-pain complaints.[7] A study conducted among 118 young adults at the Faculty of Medicine, Udayana University, Bali, reported a neck pain prevalence of 83.1%.[8] Factors associated with neck pain include individual characteristics (sex, age, body mass index, and genetics), work-related exposures (repetitive tasks, prolonged sitting, and static posture), and psychosocial factors.[9] Sustained neck flexion may increase muscular loading and discomfort, particularly during prolonged device use. In view of these findings, this study investigated the associations of working posture and duration of device use with neck pain among medical students at Sriwijaya University.

2. Method

An analytical cross-sectional study was conducted from October to November 2023 under approved protocol No. 239-2023. The study population comprised students from the 2020-2022 cohorts of the Medical Education Study Program at Sriwijaya University. A total of 102 students meeting the eligibility criteria were recruited using simple random sampling. A Google Forms questionnaire was used to collect data on device-use duration and neck-pain complaints. Participants' working postures were photographed and assessed using APECS and the Rapid Upper Limb Assessment (RULA).

Data were analyzed using IBM SPSS Statistics. Univariate analyses were used to summarize participant characteristics and study variables as frequencies and percentages. Bivariate analyses examined the associations between working posture, duration of device use, and neck pain using the chi-square test or Fisher's exact test, as reported for the relevant comparisons. Results are presented in tables and narrative form.

3. Results

3.1. Sociodemographic Characteristics

As shown in Table 1, neck pain was reported by 73 female students (71.6% of the total sample) and 17 male students (16.7%). Six female students and six male students reported no neck pain. In the 20-21-year age group, 60 students (58.8%) reported neck pain, whereas none of the five students older than 21 years reported being free of neck pain.

By device type, neck pain was reported by 47 laptop users (46.1% of the sample) and 43 iPad/tablet users (42.2%). Three laptop users (2.9%) and nine iPad/tablet users (8.8%) reported no neck pain (Table 1).

Table 1. Distribution of Sociodemographic Characteristics by Neck Pain Status

Variable	Neck Pain: Yes, n (%)	Neck Pain: No, n (%)	Total, n (%)
Age			
< 20 years	25 (24.5%)	6 (5.9%)	31 (30.4%)
20-21 years old	60 (58.8%)	6 (5.9%)	66 (64.7%)
> 21 years	5 (4.9%)	0 (0%)	5 (4.9%)
Total	90	12	102 (100%)
Gender			
Male	17 (16.7%)	6 (5.9%)	23 (22.5%)
Female	73 (71.6%)	6 (5.9%)	79 (77.5%)
Total	90	12	102 (100%)
Gadget			
iPad/Tablet	43 (42.2%)	9 (8.8%)	52 (51%)
Laptop	47 (46.1%)	3 (2.9%)	50 (49%)
Total	90	12	102 (100%)

Table 2. Frequency Distribution of Neck Pain

Category	Frequency (n)	Percentage (%)
No pain	12	11.8
Mild	39	38.2
Moderate	41	40.2
Severe	10	9.8
Total	102	100

Table 3. Distribution of Working Posture Risk

Category	Frequency (n)	Percentage (%)
Medium risk	96	94.1
High risk	6	5.9
Total	102	100

Table 4. Distribution of Students by Duration of Device Use

Category	Frequency (n)	Percentage (%)
< 2 hours	2	2
> 2 hours	100	98
Total	102	100

Table 5. Relationship Between Working Posture and Neck Pain

Working posture	Neck Pain: Yes, n (%)	Neck Pain: No, n (%)	Total, n (%)	p-value
High Risk	6 (5.9%)	0 (0.0%)	6 (5.9%)	0.357
Medium Risk	84 (82.4%)	12 (11.8%)	96 (94.1%)	
Total	90	12	102 (100%)	

Table 6. Relationship Between Duration of Device Use and Neck Pain

Duration of device use	Neck Pain: Yes, n (%)	Neck Pain: No, n (%)	Total, n (%)	p-value
< 2 hours	2 (2.0%)	0 (0.0%)	2 (2.0%)	1.000
> 2 hours	88 (86.3%)	12 (11.8%)	100 (98%)	
Total	90	12	102 (100%)	

3.2. Neck Pain

Neck pain was reported by 90 of the 102 participants (88.2%). Moderate pain was the most frequently reported severity category (41 students; 40.2%), followed by mild pain (39; 38.2%) and severe pain (10; 9.8%) (Table 2).

3.3. Working Posture

Most participants were classified as having medium-risk working posture (96 students; 94.1%), while six students (5.9%) were classified as having high-risk posture (Table 3).

3.4. Duration of Device Use

Most participants reported device use for more than 2 hours (100 students; 98.0%), whereas two students (2.0%) reported use for less than 2 hours (Table 4).

3.5. Association Between Working Posture and Neck Pain

Among students with medium-risk working posture, 84 (82.4% of the total sample) reported neck pain, compared with six (5.9%) in the high-risk group. No statistically significant association was found between working-posture risk category and neck pain (p = 0.357; Table 5).

3.6. Association Between Duration of Device Use and Neck Pain

Among participants using devices for more than 2 hours, 88 (86.3% of the total sample) reported neck pain and 12 (11.8%) reported no neck pain. Both students who used devices for less than 2 hours reported neck pain. Fisher's exact test showed no statistically significant association between duration of device use and neck pain (p = 1.000; Table 6).

4. Discussion

4.1. Sociodemographic Characteristics

Female students accounted for most of the reported neck-pain cases in this sample (73 of 90 cases). Previous studies have also described sex-related differences in the occurrence of neck pain.[10,11] Physiological

differences and variation in pain perception have been proposed as possible explanations; however, these mechanisms were not directly investigated in the present study.

Participants were aged 18-22 years, with a median age of 20 years. Neck pain was most frequently reported in the 20-21-year age group. This distribution should be interpreted cautiously because the sample covered a narrow age range and cannot establish an age-related trend.[1] Previous studies have examined musculoskeletal complaints across broader age ranges.[12] Differences in participant age and study setting may contribute to variation in reported prevalence. With respect to device type, 47 laptop users and 43 iPad/tablet users reported neck pain. Earlier research has described differing patterns of neck pain according to the device used.[13]

4.2. Neck Pain

Neck pain was reported by 90 of 102 medical students (88.2%), and 41 students (40.2%) reported moderate pain. A study conducted among 118 young adults at the Faculty of Medicine, Udayana University, Bali, reported a neck pain prevalence of 83.1%.[8] Another study among medical students in Jakarta reported lower neck pain in 38 of 56 participants (67.9%).[14] These estimates varied across the study populations and settings.

4.3. Working Posture

RULA assessment indicated that 96 students (94.1%) had medium-risk working posture (scores of 3-4), suggesting that further investigation and changes in posture may be warranted. Six students (5.9%) had high-risk working posture (scores of 5-6), indicating a greater need for prompt ergonomic intervention. A previous study reported moderate- and high-risk postures in 78.3% and 21.7% of participants, respectively.[11] Another study reported 45 students (80.4%) with moderate-risk posture and 11 students (19.6%) with high-risk posture.[14]

4.4. Duration of Device Use

In this study, 100 of 102 students (98.0%) reported using devices for more than 2 hours. Previous research has also documented prolonged device use among students, including a reported proportion of 96.7%.[11] These findings suggest that prolonged device use is common in student populations, although the definitions of exposure may differ between studies.

4.5. Association Between Working Posture and Neck Pain

Working-posture risk category was not significantly associated with neck pain in this sample ($p = 0.357$; Table 5). A previous study among medical students in Jakarta likewise reported no statistically significant association between sitting posture and lower neck pain ($p = 0.084$).[14] In contrast, Wicaksono et al. reported a statistically significant association between working posture and musculoskeletal complaints among architecture students.[11] Differences in ergonomic practices, study populations, and assessment methods could contribute to these varying findings.

The manuscript describes the use of backrests and stretching breaks after approximately 1-2 hours of device use. These practices may help reduce sustained muscular loading, but their independent associations with neck pain were not evaluated in the reported analyses. Therefore, their possible effects cannot be established from the present findings.

4.6. Association Between Device Use Duration and Neck Pain

The present study found no statistically significant association between the duration

of electronic device use and neck pain (Fisher's exact test, p = 1.000). This finding is consistent with Algarni et al., who reported no significant association between computer use duration and overall musculoskeletal pain among medical students in Saudi Arabia (p = 0.719).[17] Likewise, Dighriri et al. found no statistically significant association between the duration of computer use and musculoskeletal pain among medical students at Jazan University, Saudi Arabia.[18] Similarly, Behera et al. found no significant association between smartphone use duration and neck pain among medical students in India.[16] However, these findings differ from those of Kenwa et al., who reported a weak but significant correlation between smartphone use duration and neck pain intensity (r = 0.209, p = 0.023).[8] Dewantari et al. also reported a significant association between device use of at least two hours per day and musculoskeletal complaints related to text neck syndrome (p = 0.007).[15] Differences in study populations, exposure assessment, outcome measures, and sample distributions may contribute to these inconsistent findings. Furthermore, the very small number of participants reporting less than two hours of device use in the present study limits the precision of the comparison.

5. Conclusion

Neck pain was reported by most medical students in this study. Medium-risk working posture and device use for more than 2 hours were also common. However, no statistically significant associations were found between working-posture risk category or duration of device use and neck pain among medical students at Sriwijaya University.

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