

Use of Smartphones, ipads, Laptops and Desktops as A Risk Factor for Non-Specific Neck Pain among Undergraduate University Students

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ABSTRACT

Purpose: This study aimed at determining the association between non-specific neck pain and the use of smart phones, iPads, laptops, and computers by university students.

Relevance: Neck pain is frequently common among adults and contributes significantly to the demand for medical services and the economic burden of absence from work. Population-based studies indicated a prevalence of neck pain between 12 and 34% with an elevated prevalence of the symptoms among users of portable electrical devices. Prolonged use of computers, smartphones and other electronic devices is very common among university students.

Participants: This is a cross-sectional study included 355 undergraduate students from King Abdulaziz University. The data were collected through interviewing using a structured questionnaire to investigate the frequency of neck pain in relation to the types of devices used by the students.

Methods: Students had pain or numbness in the neck according to the frequency of reported pain episodes; pain or numbness in the neck responded by saying very often, often, quite often, sometimes and never. The question of assessment of neck pain was 'Have you had an ache; pain or numbness in the neck during the last 12 months?'

Analysis: The comparisons were made between respondents according to the gender variable, type of devices used in the study and types of devices used for entertainment. The chi-square test was used to detect the significant differences between categories. In this study, a P-value less than 0.05 was assumed to be statistically significant⁽¹⁾.

Results: The vast majority of the students were electronic devices users 98%, of them, 92% of used both smartphones and iPads for entertainment, while 32% used these devices for purpose of study. Approximately 64% of the students never complained of neck pain, while 8.2% suffered from neck pain either often or very often. The findings of this study showed significant associations between neck pain and risk factors such as gender, type of devices used for entertainment, and type of devices used for study. About 44% of female students reported the occurrence of neck pain in comparison with only 29% of male students. Regarding the type of devices used for entertainment, 26.3% of students used smartphone and iPad for entertainment, while only 16% of students used desktops and laptops for this purpose. On another side, 45.2% of the students used smartphone and iPads for study, while about 26% of them used desktops and laptops to study.

Conclusions: Most of the university students use electronic devices usually for leisure activities. About a third of the students complained of neck pain symptoms which showed significant associations with female gender and use of small portable devices, smartphone and iPads, either for study or leisure purposes.

Keywords: Neck pain, Smartphones, iPads, Laptops, Students, University.

INTRODUCTION

Neck pain causes a great personal discomfort due to disability, pain, reducing work productivity and poor quality of life^(1,2). Neck pain is frequently common among adults and contributes significantly to the demand for medical services and the economic burden of absence from work due to illness. Population-based studies indicated a prevalence of between 12 and 34%⁽³⁾.

Neck pain is assumed to be a multifactorial condition, and therefore there are several risk factors contributing to its development. Risk

factors can be work-related or non-work-related, and they can be divided roughly into 3 categories physical, psychosocial, and individual risk factors⁽⁴⁾. The physical factors can be explained by the distribution of physical load on the musculoskeletal skeleton. Frequently, neck muscles can be strained from bad positioning either it's hunching over the workbench or leaning over the computers and smartphone devices⁽⁵⁾. Causes of neck pain could be ranged, from recurrent movement strain to discrete spine

conditions or disc that cause painful nerve compression⁽⁶⁾.

Psychosocial risk factors also seem to play a major role in the development of neck pain, such as demands and control over work, work organization factors, work satisfaction, and social support at work and in leisure time⁽⁷⁾. The third factor is individual risk factors, the incidence of neck pain and neck disorders elevates with age until the late middle age and declining thereafter. Many of these reasons are associated with daily wear and deterioration of the natural aging process the neck is particularly vulnerable because of the weight that it must support while remaining flexible⁽⁸⁾. Therefore, everyone can experience some amount of neck pain during their lives. It is less common among men than among women⁽³⁾. Work-related cervical disorders are common problems in office workers, especially among computer users⁽⁹⁾. The global trend is people use computers for longer periods per day, due to elevated computer-based tasks at work as well as during recreational activities.

Using computers and smartphones and other electronic devices is very common among undergraduate students. Many epidemiological studies published the presence of the relationship with the neck pain⁽¹⁰⁾. University students who participated in long-term computer work and with longtime computer use showed upper extremities symptoms⁽¹¹⁾. There is also a limited evidence of the relationship between neck pain and clinical risk factors. Most previous studies have examined the effects of psychosocial factors on neck pain in university students regardless of clinical factors such as endurance, muscle strength, and co-mobility⁽¹²⁾. This study aimed to study the association between non-specific neck pain and the use of smartphones, iPads, and computers in university students.

METHODS

This is a cross-sectional study included 355 undergraduate students from King Abdulaziz University from different colleges. The data were collected through interviewing using a questionnaire to investigate the frequency of neck pain in relation to the pattern and types of devices used by the students.

The students who had aches, pain or numbness in the neck according to the frequency of reported aches, pain or numbness in the neck responded by very often, often, quite often, sometimes and never. The question of assessment

of neck pain was 'Have you had an ache, pain or numbness in the neck during the last 12 months?'. The questions of assessment of associated risk factors were, 'Have you suffered from sleeping disturbances, depression, exhaustion at study, or anxiety during the last 12 months?'.
The comparisons were made between respondents according to the gender variable, type of devices used in study and types of devices used for entertainment. The chi-square test was used to detect the significant differences between categories. In this study, a P-value less than 0.05 was assumed to be statistically significant.

The study was done after approval of ethical board of King Abdulaziz university.

RESULTS

The included 355 university students responded to the study questions about neck pain and associated risk factors. Approximately 54% of the patients were males with the majority of them were single (76%). About 92% of the students use both smartphones and iPads for entertainment, while 32% of them use smartphones and iPads during their study. The vast majority of the students were electronic devices users (98%). Approximately 64% of the students never complained of neck pain, while 8.2% suffered from neck pain either often or very often. The most common psychological risk factor for neck pain was the exhaustion at study which was observed in 16.9% of the students, followed by sleeping disturbances which affected 11.8%, anxiety drop 5.4% and finally depression reported in only 3.5% of the students (table 1).

The findings of this study showed significant associations between neck pain and risk factors such as gender, type of devices used for entertainment, and type of devices used during their studies. About 44% of female students reported the occurrence of neck pain in comparison with only 29% of male students, this difference between male and female was significant with P value equals to 0.003. Regarding the type of devices used for entertainment, 26.3% of students used the smart phone and iPad for entertainment, while only 16% of students used the desktops or laptops for this purpose. This difference was found significant with P value equals to 0.005.

On another side, 45.2% of the students used smartphone and iPads for study, while about 26% of them used desk or laptops during their studies. This difference was found significant at P value less than 0.005 (table 2).

Table (1): Distribution of demographic variables among university participants

Demographic variable		Frequency	Percent
Gender	Male	192	54.1%
	Female	163	45.9%
Marital status	Single	271	76.6%
	Married	71	20.0%
	Others	13	3.7%
Use for entertainment	Smartphones and iPads	328	92.4%
	Desktops	76	21.4%
	Laptops	163	45.9%
Use for study	Smartphones and iPads	115	32.4%
	Desktops	74	20.8%
	Laptops	221	62.3%
Using electronic devices	Users	348	98.1%
	Non-users	7	1.9%
Complain of neck pain	sometimes	48	13.5%
	Quite often	51	14.3%
	often	16	4.5%
	Very often	13	3.7%
	Never	227	63.9%
Psychological risk factors	Sleeping disturbances	42	11.8%
	depression	12.4	3.5%
	Exhaustion at study	60	16.9%
	Anxiety	19	5.4%

Table (2): The significant risk factors associated with neck pain among University students

Risk factor		Neck pain (%)		Chi-square	P value
		Yes	No		
Gender	Female	72 (44.2%)	91 (55.8%)	8.6	0.003
	Male	56 (29.2%)	136 (70.8%)		
Use for entertainment	Smart phones and iPads	88 (26.3%)	240 (73.7%)	8.1	0.005
	Desktops and laptops	40 (16.7%)	199 (83.3%)		
Use for study	Smartphones and iPads	52 (45.2%)	63 (54.8%)	14.6	0.001
	Desktops and laptops	76 (25.8%)	219 (74.2%)		

DISCUSSION

The current study found that neck pain was associated with both work-related (psychosocial and physical), and individual factors. Different studies have taken physical and psychosocial job factors into account when studying neck pain ⁽¹⁰⁾. The results showed some evidence for a positive relationship between the risk factors and the occurrence of neck pain.

The study showed that there was a significant relationship between gender and neck pain, this conclusion agrees with that found by several studies ⁽⁶⁾. The prevalence of neck pain was higher among women (44%) Compared to men (29%), which is

consistent with results of previous studies ⁽¹⁰⁾. This could be attributed to the weak force of the shoulder muscles of women. The current study indicated that 92% of the students use both smartphones and iPads as a means of entertainment. In addition, about 32% of the students use smartphones and iPads for academic purposes. However, this contradicts with a study found by **Diepenmaat *et al.*** ⁽¹³⁾ which strengthens the findings that musculoskeletal pain is common among adolescents and is associated with depression and stress but not with computer use and physical activity. This might be a result of the increase in the number of students using computers

excessively. In this study, only 32% of the students use smartphones and iPads for academic purposes. Different results were found by **Aljomaa *et al.*** ⁽¹⁴⁾ who showed that the majority of students use the smart phone for studying purposes. The spread of smartphones devices among youth in the Gulf region is also emphasized by the same study.

The present study demonstrated that excessive use of the smartphone is associated with neck pain among healthy young undergraduate students which are similar to a study found by **AlAbdulwahab *et al.*** ⁽¹⁵⁾. In addition, this finding supports earlier work showing a high level of computer use related musculoskeletal symptoms around the neck among young college students of King Saud University in Saudi Arabia ⁽¹⁶⁾, and that smartphone addiction caused physical health-related problems ⁽¹⁷⁾.

However, to date, the preventive effectiveness of neck pain at university students, based predominantly on ergonomic principles, is not enough. Therefore, Future studies should consider the importance of all the risk factors. The ergonomic principles alone are not sufficient for explaining the etiology of neck pain. Studies found that other risk factors should be included ⁽¹⁸⁾. These Factors include amplification of pain and other disorders such as osteoarthritis which need to be considered.

CONCLUSION

Most of the university students use electronic devices usually for leisure activities. One-third of the students complained of neck pain symptoms which were common among females who use even small portable devices, smartphones and pads, either for academic purposes or amusement

Conflict of interests

The author declares no financial conflict of interests

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