

Neck pain among medical students in KSA after applying distance education during COVID-19 era

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ABSTRACT

Background: Neck pain is progressively becoming a health issue with significant socioeconomic consequences for individuals, their families, and communities. Neck pain is a substantial source of sickness, reduced educational performance, and absenteeism from university classes, all of which have an impact on student's future careers.

Methods: The study used a cross-sectional design based on an electronic questionnaire for data collection. The study included a total of 449 college-level student participants. Around 262 (55%) participants were male, and 211 (45%) were female. In total, 53% of the students were from the private sector, and (82%) preferred the sitting position as their favorite study posture.

Results: The prevalence of neck stiffness was high, and the overall impact was average, with students' mean score being $1.9 \text{ SD } \pm 0.55$. The females were more affected than the males, with a p-value of 0.015. Over half of the students suffered from morning neck stiffness (53%), which varies from mild pain (34%), moderate (17%) and severe (2%). The pain was tolerable without using medications and did not significantly affect their quality of life. However, 20% of the students found it hard to study and do their daily activities without using meds.

Conclusions: Our findings revealed a high preference for neck stiffness among medical students. Despite the fact that the majority can cope with the pain without medication, we cannot overlook 20% of the students who found it hard to study and do their daily activities without using meds and how it affected their quality of life.

Key words: Neck Pain, Medical students, Distance education, COVID-19

HOW TO CITE THIS ARTICLE: Mohammed H Karrar Alsharif, Ali Hassan A Ali, Abdullah A Alghamdi, Yousef M Alsomali, Khalid Z Aljulaifi, Abdullah S Alsayari, Hamoud M Almubki, Fahad A Alzahrani, Neck Pain among Medical Students in KSA after Applying Distance Education during COVID-19 Era, J Res Med Dent Sci, 2022, 10 (11): 88-93.

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Received: 25-Oct-2022, Manuscript No. JRMDs-22-78144;

Editor assigned: 27-Oct-2022, PreQC No. JRMDs-22-78144(PQ);

Reviewed: 10-Nov-2022, QC No. JRMDs-22-78144(Q);

Revised: 15-Nov-2022, Manuscript No. JRMDs-22-78144(R);

Published: 22-Nov-2022

INTRODUCTION

Neck pain (NP) is increasingly becoming a health problem and has a considerable socio-economic impact on individuals, their families, and communities [1,2]. Neck pain is a significant cause of sickness, reduced educational attainment, and truancy from university lessons, affecting students' future careers [1].

A medical school's principal aims are to produce capable, professional doctors and promote society's health care. However, during the period of medical training, they expose students to stress, study problems, and long training hours in hospital wards and clinics during the period of their medical practice [3]. Medical students seemed to have a higher risk of developing NP than the general population [4], especially now that medical schools recommended using online learning and applying distancing measures that subjected them to prolonged hours spent on different devices [5]. Besides the factors predisposing to pain in the general population, students subject themselves to hours of prolonged reading, writing, and clinical practice, which make them a high-risk group for NP. Furthermore, computer or tablet use is ubiquitous among medical students [6].

Previous studies have reported a high prevalence of NP

in medical students. A study conducted at a Malaysian medical college found that 41.8% of students had NP within the past year and reported an association with clinical years, computer use, and a prior history of trauma [3]. Studies conducted in Pakistan, Australia, New York, the United States of America (USA), China, and Brazil found that 65, 52.8, 35, 33.8, and 8.23% of medical students had NP, respectively [7-11]. Another study in Central Saudi Arabia reported a prevalence of 56.5% for NP among medical students [12]. A Nigeria study revealed that the respondents' lifetime prevalence of NP was 34.9% [13].

Neck pain has a multi-factorial origin, and several factors are contributing to its onset and perpetuation. According to Guzman and his colleagues, physical, psychosocial, and individual-related factors were the most reported NP factors among medical students [14]. It can be caused by interference surrounding anatomical neck structures like nerve, airway, vascular, musculoskeletal, prolonged activity, poor posture, and previous neck injury [15].

Socio-demographic factors, for example, gender, age, body mass index (BMI), behavioural and psychosocial factors like smoking, drinking habit, physical exercise, stress, sleeping hours, physical factors, for instance, tablet or computer use, long sitting hours, seats without back supports, duration of reading, repetitive movements and awkward posture are considered as associated factors of NP among medical students. Because of this in explicit pain, medical students undergo frequent sick leave, medical disability, functional impairments, decreased productivity, health cost, and absenteeism from university lessons [16-21].

Aim and objectives

To explore students' perceptions in medical schools about neck pain after the implementation of E-learning in KSA after the COVID-19 era.

METHODOLOGY

Study design

The study is a cross-sectional, exploratory study consisting of a quantitative (self-administered questionnaire). Data about medical students' perception

of neck pain after implementing E-learning is compared with traditional or engagement teaching methods.

Methods

A predesigned questionnaire was developed following a thorough literature search; items will be explored using a five-point Likert scale (5=strongly agree, 4=agree, 3=I'm not sure, 2=disagree, 1=strongly disagree).

The questions were constructed after a systematic search in the literature using the search terms (COVID-19 and medical education/ COVID-19 and neck pain / COVID-19 and online teaching); the search was conducted in PubMed and Scopus during the period from April to Nov 2020 and included all types of articles in the English language published from 2020.

Sampling and sample size

The sample size was calculated by an online Open-epi calculator based on the predicted anticipated subjects. The assumption is that 20% of the population will participate in this study. This would give the study and 90% power to detect differences of 0.05 at the α -level.

Regarding the Data analysis, the Ordinal data obtained from the participant's responses to the questionnaire will be converted to quantitative data. The collected data will be analyzed using the Statistical Package of Social Sciences (SPSS). They will be summarized and presented as mean, median, standard deviation, and significance level set at the 95% confidence interval (CI).

RESULTS

Characteristics of participants

The study included a total of 449 college-level student participants. Around 262 (55%) participants were male, and 211 (45%) were female. In total, 53% of the students were from the private sector, and (82%) preferred the sitting position as their favorite study posture. The results obtained from the analysis show that the students believe that tablets and laptops are the most suitable devices for E-learning, 1% & 49% respectively; nevertheless, approximately one-third of the participating students preferred using the PC (Table 1 and Figure 1) summarizes their demographic,

Table 1: Demographic characteristics of participants.

		Count	%
Gender	Male	251	55.90%
	Female	198	44.10%
Medical school	Governmental	199	44.30%
	Private	250	55.70%
	Preparatory Year	92	20.50%
Level of study	2nd year	93	20.70%
	3rd year	91	20.30%
	4th year	42	9.40%
	5th year	81	18.00%
	6th year	50	11.10%
Favorite body posture during the online sessions	Sitting	368	82.00%
	Lying	81	18.00%

Devices more suitable for online teaching

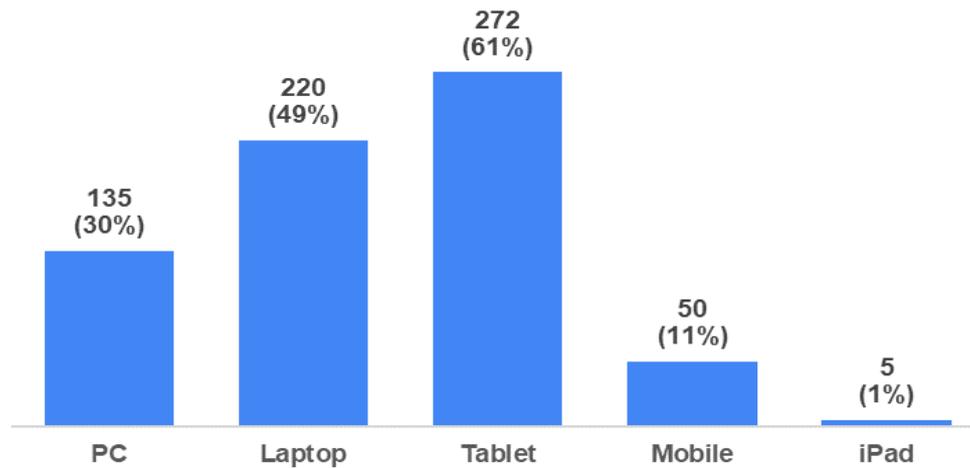


Figure 1: students' response to their preferred device for only period.

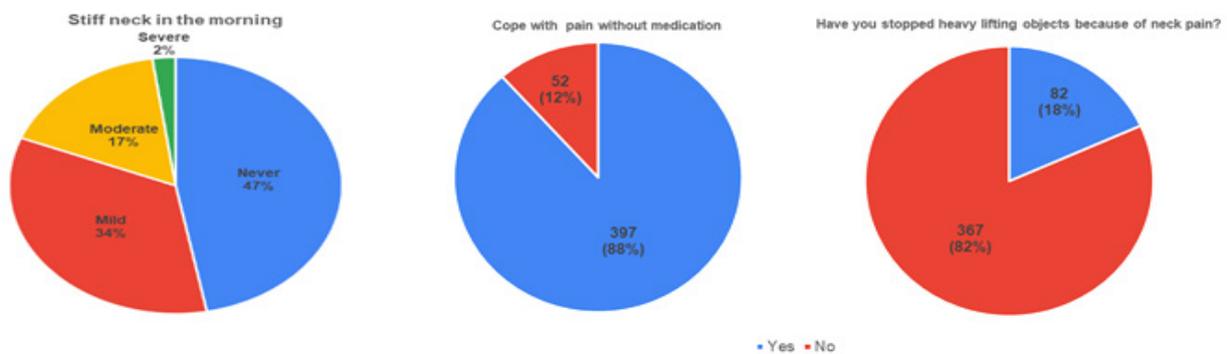


Figure 2: Shows the students' history of neck stiffness 1, how they cope up with pain 2, and to what extent it affected their daily activities 3.

academic, and preference.

History of neck stiffness

An overview of data results shows that a great proportion of students suffered from morning neck stiffness (53%), of which around (34%) experienced mild pain, (17%) had moderate and only (2%) had severe neck stiffness. Even so, the pain was tolerable, and the majority was able to cope with or without using medications, and it did not stop them from either their daily activities or heavy lifting (Figure 2).

Neck stiffness effect on students during the lockdown

The overall effect of the neck stiffness was average, with a mean score of 1.9 SD ±0.55. It is apparent from the findings that the majority believe that stiffness increases with the increase of study hours, and it may affect their concentration while studying during the day (Figure 3).

The overall results also showed -to the majority- the students occasionally experience pain and movement limitations while trying to move or tilt their heads as a result of neck issues. It also affected their sleeping at night; occasionally, many participating students

expressed neck pain early in the morning (Tables 2 and Table 3).

Factors Associated with neck stiffness

Variables potentially associated with neck stiffness among students were identified: gender, level of study, and favorite body posture. These variables were tested for associations with their responses to medication use, heavy lifting, studying for a long time, trouble concentrating during the day, experiencing neck stiffness at night or in the morning, and difficulties with head movements (Table 4).

Gender

The findings revealed a significant association between gender and long-time study p-value 0.000. in addition, females suffered from neck stiffness more often than males. Even though both experienced difficulties with concentration, -for the majority- it was occasional, but females had experienced it more often than male's p value 0.015.

The data also showed significant associations between the gender and headache, head tilting during the day, and head movements after waking up p values of 0.031, 0.030,

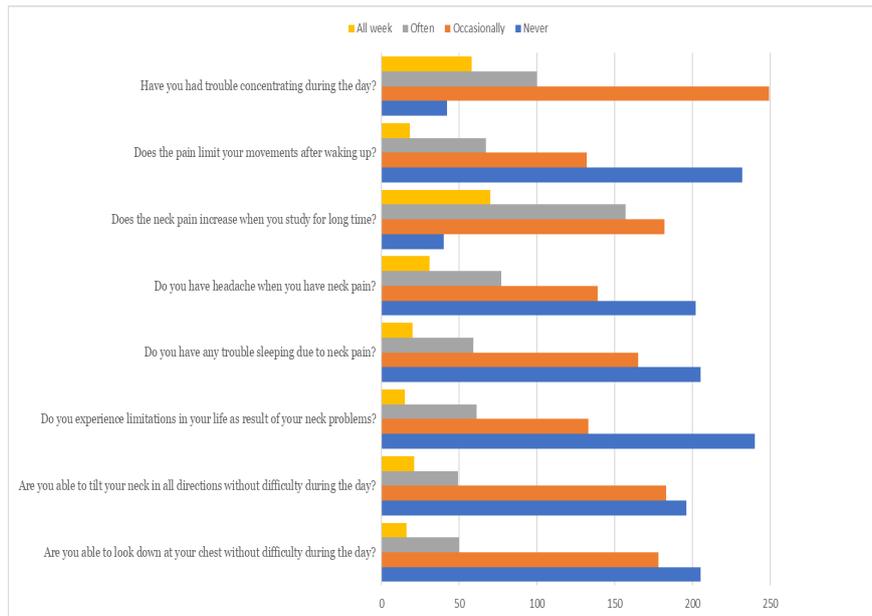


Figure 3: The frequency and percentage of the participants' response.

Table 2: Shows the means and median of the participants' scores.

Item	Mean	Median
Does the neck pain increase when you study for a long time?	2.6	3
Have you had trouble concentrating during the day?	2.4	2
Are you able to look down at your chest without difficulty during the day?	1.7	2
Are you able to tilt your neck in all directions without difficulty during the day?	1.8	2
Do you experience limitations in your life as a result of your neck problems?	1.7	1
Do you have a headache when you have neck pain?	1.9	2
Do you have any trouble sleeping due to neck pain?	1.8	2
Does the pain limit your movements after waking up?	1.7	1

1. Never 2. Occasionally 3. Often 4. All week

Table 3: The frequency and percentage of the participants' response.

Item	Never	Occasionally	Often	All week
Are you able to look down at your chest without difficulty during the day?	205 (45.66%)	178 (39.64%)	50 (11.14%)	16 (3.56%)
Are you able to tilt your neck in all directions without difficulty during the day?	196 (43.65%)	183 (40.76%)	49 (10.91%)	21 (4.68%)
Do you experience limitations in your life as a result of your neck problems?	240 (53.45%)	133 (29.62%)	61 (13.59%)	15 (3.34%)
Do you have any trouble sleeping due to neck pain?	205 (45.66%)	165 (36.75%)	59 (13.14%)	20 (4.45%)
Do you have a headache when you have neck pain?	202 (44.99%)	139 (30.96%)	77 (17.15%)	31 (6.90%)
Does the neck pain increase when you study for a long time?	40 (8.91%)	182 (40.53%)	157 (34.97%)	70 (15.59%)
Does the pain limit your movements after waking up?	232 (51.67%)	132 (29.40%)	67 (14.92%)	18 (4.01%)
Have you had trouble concentrating during the day?	42 (9.35%)	249 (55.46%)	100 (22.27%)	58 (12.92%)

Table 4: Chi-Square association by the gender, level of study, and favorite body posture.

Item	Gender	Level of study	Favorite body posture
Can you cope with your pain without medication?	0.751	0.619	0.812
Have you stopped heavy-lifting objects because of neck pain?	0.345	0.107	0.701
How stiff is your neck when you have just woken up in the morning?	0.208	0.018	0.552
Does the neck pain increase when you study for a long time?	0.000*	0.269	0.606
Have you had trouble concentrating during the day?	0.015*	0.976	0.337
Are you able to look down at your chest without difficulty during the day?	0.030*	0.361b	0.914
Are you able to tilt your neck in all directions without difficulty during the day?	0.067	0.055b	0.083
Do you experience limitations in your life as a result of your neck problems?	0.075	0.020*	0.063
Do you have a headache when you have neck pain?	0.031*	0.67	0.757
Do you have any trouble sleeping due to neck pain?	0.121	0.323	0.26
Does the pain limit your movements after waking up?	0.011*	0.011*	0.066

*: The Chi-square statistic is significant at the .05 level

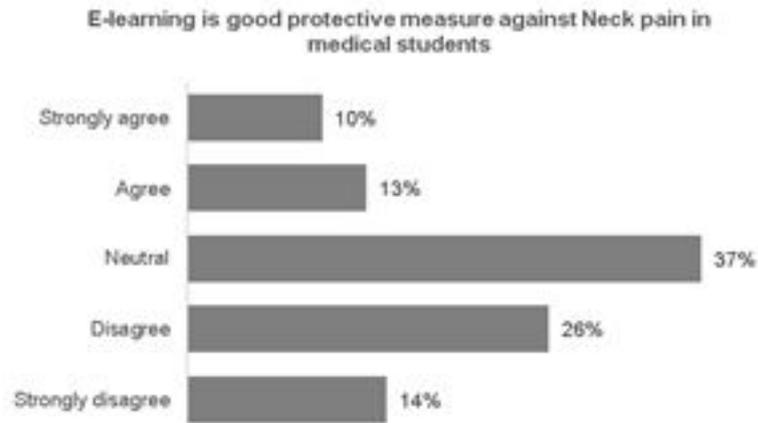


Figure 4: Students' response to their beliefs regarding the E-learning.

and 0.011, respectively. However, based on gender; around 50% of all variables have not experienced these issues.

Level of study

Test for chi-square association shows a significant association between the level of the study and head tilting during the day and head movements after waking up p values 0.020* and 0.011*, respectively. However, less than 50% of the students have suffered or experienced neck stiffness during the lockdown period (Figure 4).

Favorite body posture

The sitting position is the preference for most of the students during the online period; however, chi-square showed no significant association.

DISCUSSION

Ever since the pandemic era and the impact it cost on medical education, there has been a move toward E-learning as a strategy to overcome this obstacle [22]. The study aimed to test the effect of neck stiffness during the covid 19 eras and its impact on online learning and quality of life. Our findings revealed a high preference for NS among medical students, which supports the findings of another study conducted by AlZarea, et al. which mentioned very high NS prevalence (77%) [23]. It is apparent from the findings that over half of the students reported suffering from NS, of which around 19% experienced mild and severe pain. These findings may explain why around 18% of the students preferred to study while lying on a couch, floor, or bed. Even though that approximately 80% of the participants do not use medications and can cope with the pain, we cannot ignore the fact that a considerable number of the students, 20%, find it hard to study and do their daily activities without using meds.

In response to how NS affects their concentration, very few students reported that they did not have trouble concentrating during the day, while many have found it quite often, 22.27% and around 12% had issues with concentration all week, especially those who study for a long time. When the participants were asked how it

affected their life, the majority commented that the effect on their day and sleeping is occasional. However, we cannot ignore the great percentage of the students who suffered from NS all week or at least quite often, which may have led them to decrease their daily study hours. Only a few participants expressed their beliefs about the impact of E-learning and how it was considered an excellent protective measure against Neck pain in medical students during the lockdown era (Figure 4). These results provide important insights into these matters and how they may affect students' productivity and quality of life.

In the current study, the findings revealed a significant association between gender and NS. It is apparent from the findings that the females suffered from neck stiffness more often than males and experienced more difficulties with concentration, headaches, and tilting than males. This might be due to the fact that females spend more study hours than males, which on the other hand, could be related to cultural reasons where females spend more hours at home than males.

In the current study, a small disparity was found between the responses regarding the level of education and favorite posture, where few differences were found. However, the findings indicated no significant association.

CONCLUSION

Few studies were conducted in Saudi Arabia regarding the impact of NS on the student's performance and quality of life. Our findings revealed a high preference for NS among medical students. Despite the fact that the majority can cope with the pain without medication, we cannot overlook 20% of the students who found it hard to study and do their daily activities without using meds and how it affected their quality of life.

ACKNOWLEDGMENT

This publication was supported by the Deanship of Scientific Research at Prince Sattam bin Abdulaziz University, Alkharj, Saudi Arabia.

AUTHORS CONTRIBUTIONS

This work was performed in collaboration with all authors. They designed the study, collected and processed questionnaires, created the manuscript, and approved the final version of the manuscript.

CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interest.

AVAILABILITY OF DATA AND MATERIALS

The data are available upon request from the authors.

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