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Prevalence and associated factors of neck, shoulder, and low-back pains among medical students at Umm Al-Qura University, Saudi Arabia: A cross-sectional study

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ABSTRACT

Background: Medical students frequently complain of neck, shoulder, and lower back musculoskeletal pain (MSP), which is a very common health issue. This study's major goal is to measure and assess the prevalence of neck, shoulder, and lower back pain among medical students at Umm Al Qura University in Saudi Arabia and to look into the risk factors for MSP. *Methods:* This descriptive cross-sectional study was done from January 2022 to February 2022. The study was done on 495 medical students who were chosen through a random sample. The survey was structured, and self-administered. ***Results:*** Throughout a number of academic years, we polled 495 college students. With the exception of the fifth year (45; 9.1%) and the sixth year (47; 14.9%), when we received fewer response, the distribution of academic years was comparable. There were 449 participants who reported they did not smoke, and none of the participants reported having recently experienced any MSK trauma. However, 181 participants reported having MSP, and half of them said the pain interferes with their study time, while the other half said the pain does not interfere with their ability to sleep well or perform their daily tasks. Only (41; 22.7%) reported that the pain interferes with their ability to study. The majority of the participants were female (326; 65.9%). *Conclusion:* The risk factors for musculoskeletal pain in medical students include insufficient sleep and little physical activity. We can control MSP, though, thanks to improved behavioral change understanding and future medical therapies.

Keywords: Musculoskeletal pain, Medical students, Makkah, Low-back pain

1. INTRODUCTION

Musculoskeletal pain (MSP) is a common health problem, which affects many people, of different ages around the world. At some time in their lives, probably more than half of the general public will look for treatment for lower back pain (LBP) (Parreira et al., 2018; Alzahrani et al., 2022). According to a recent survey, 1.71 billion people worldwide suffer from musculoskeletal disorders (Cieza et al., 2021). These conditions impair the functions of people and affect their quality of life. Musculoskeletal problems were ranked as the second most common cause of disability worldwide according to the Global Burden of Disease (GBD) survey (Global Burden of Disease Study, 2017). Also, musculoskeletal pain has a negative social, psychological, and economic influence.

Several papers have been done to study musculoskeletal pain, in different countries and among different groups of age with different methods, considering many factors. For example, Musculoskeletal Pain Frequency in people with exhausting occupations, like health care workers, was between 35-45% (Long et al., 2013). A study among dental hygiene students measured Musculoskeletal Pain Frequency, and it was 64% for neck pain, 57% for lower back pain, and 48% for shoulder pain (Hayes et al., 2009). For Saudi Arabia, medical students' occurrence of musculoskeletal pain at University Hospitals in the central region was 40.5% for lower back pain, 25.6% for shoulder pain, and 24.1 % for neck pain (Algarni et al., 2017).

There are many factors related to medical students that affect musculoskeletal pain, such as the GPA of students, duration of the study, the position of sitting, and frequent breaks. Other factors like BMI, smoking, duration, quality of sleep, and regular exercise. In addition to psychological factors such as anxiety and depression. All these factors and their relation to musculoskeletal pain need to be measured. The study aims to measure how common musculoskeletal pain is, which consists of the neck, back, and shoulder pains, and their relation to many factors among UQU medical students, in Saudi Arabia and how can we reduce it.

2. METHODS

The present study is a web-based descriptive cross-sectional study. The participants were undergraduate medical students of Umm Al-Qura University, Saudi Arabia. In February 2022 a cross-sectional investigation was carried out by conducting an online survey via multiple social media channels with a sample size of 495 participants. The average number of medical students at UQU during the academic year 2022 is 1300. The Sample Size Calculator program indicates that 297 is the minimum suggested sample size for this study with a 95% confidence level, a 5% margin of error, and a 50% response distribution. However, 495 participants were collected in case of possible data loss and to ensure reliability. The study sample was equally distributed among the six academic years. We used convenience sampling. The inclusion criteria consisted of undergraduate medical students from 2nd to 6th year at Umm Al-Qura University, Makkah, Saudi Arabia.

There were three sections to the questionnaire. The consent form was shown first.The second part recorded academic and demographic characteristics including gender, year of study, grade point average (GPA), and body mass index (BMI). The third part comprised a set of Specific questions related to the objectives of the research (present musculoskeletal pain, trauma history, using a medication, position of studying, studying duration, sleeping duration, and presence of psychiatry illness). These questions were designed to determine the prevalence of MSP and associated factors. Participant responses were collected using Google Platform, and all the questions had one option to select. According to the questionnaire's creators.

The questionnaire's results were entered into SPSS version 22. The sociodemographic and academic characteristics of the participants were summarized using descriptive parameters. Tables and graphs were used for descriptive purposes. Multiple logistic regression analysis and chi-square analysis were used to measure the association of different factors with MSP. A p-value is considered significant if it was less than 0.05.

Ethical statement

The study aims and ensures confidentiality and anonymity. The objectives of the study were clarified to participants at the top of the survey. All participants were approved to be part of this study. Contact details and names were not involved in the survey. The proposal has been approved by Umm Al Qura University Ethical committee (ethical number: HAPO-02-K-012-2022-01-926)

3. RESULTS

We surveyed 495 college students overseveral academic years. The supplementary index contains all the statistical tables.The sociodemographic details of the study sample are shown in Table 1. The distribution of academicyears was comparable except forthe 5th year (45; 9.1%) and 6th year (47; 14.9%) which we got less response from them. It was observed that most of the students were female (326; 65.9%), and the remaining were male (169; 34.1%). the majority of the students who responded to the questionnaire's their GPAs degree higher than 3.50 (341; 68.9%). Almost half of the students (264; 53.8%)were normal body weight

(i.e. BMI = 18.5-24.9), (82; 16.7%) were underweight (BMI = <18.5), (90; 18.3%) were overweight (BMI = 25.0-29.9), (30; 6.1%) were obese class-I (BMI= 30.0-34.9), (17; 3.5%) were obese class- II (BMI= 35.0-39.9) and only (8; 1.6%) were obese class- III (BMI= >40).

Table 1 The study sample's demographical characteristics (n=495)

Variable	N	%
Academic Year		
2nd year	121	24.4
3rd year	131	26.5
4th year	124	25.1
5th year	45	9.1
6th year	74	14.9
Gender		
female	326	65.9
male	169	34.1
GPA		
3.6-4	341	68.9
3.1-3.5	125	25.3
2.6-3.0	26	5.3
less than 2.5	3	0.6
BMI		
Underweight (<18.5)	82	16.7
Normal (18.5–24.9)	264	53.8
Overweight (25.0–29.9)	90	18.3
Obese class I (30.0–34.9)	30	6.1
Obese class II (35.0–39.9)	17	3.5
Obese class III (40 or more)	8	1.6

Features of the study sample's behavior were examined and the questions thatwere used are shown in Table 2. There were (449; 90.7%) participants who reported they are not smoking and no one from all the participants had any MSK trauma recently however (181; 36.6%) reported that they have MSK pain (figure 1) and half of them said the pain affects their studying time, in contrast, half of them said that the pain does not affect their sleep quality or their daily tasks, and only (41; 22.7%) used different medications for the pain.

Table 2 Features of the study sample's behavior (n=495)

Variable	N	%
Are You, Smoker		
yes	46	9.3
no	449	90.7
Have you had Musculoskeletal (neck, shoulder, back,…) trauma recently?		
no	495	100
Do you have Musculoskeletal (neck, shoulder, back,…) pain now?		
yes	181	36.6
no	314	63.4
Does the pain affect your studying time?		
Yes	94	51.9
No	87	48.1
Does the pain affect your sleep quality?		
Yes	84	46.4

No	97	53.6
Does the pain affect your daily tasks?		
Yes	77	42.5
No	104	57.5
Do you use any medication for Musculoskeletal pain?		
Yes	41	22.7
No	140	77.3
IF yes what is it?		
Paracetamol	34	18.8
NSAID	4	2.2
Not use any medication	130	71.8
Paracetamol and NSAIDs	10	5.5
Voltren Gel	1	0.6
Parafon	1	0.6
Moov cream	1	0.6
How many hours do you study per day?		
0-2h	74	14.9
2-4h	174	35.2
4-6h	153	30.9
More than 6h	94	19
What is your almost position during study?		
Sitting in chair	269	54.3
semi-sitting	125	25.3
lying down	51	10.3
Standing	4	0.8
walking	46	9.3
Do you take frequent breaks during study time?		
yes	421	85.1
no	74	14.9
How many times do you exercise in a week?		
daily	62	12.5
twice per week	97	19.6
once per week	102	20.6
not exercise at all	234	47.3
How many hours do you sleep every day?		
less than 4 hours	25	5.1
4-6h	150	30.3
6-8h	246	49.7
More than 8h	74	14.9
How do you feel after waking up?		
Non-refreshing	262	52.9
refreshing	233	47.1
How frequently in the last two weeks has a lack of enthusiasm or enjoyment in doing things upset you?		
Not at all	129	26.1
several days	218	44
more than half the days	89	18
Nearly every day	59	11.9

How frequently have you been harassed during the previous two weeks? by feeling down, depressed, or hopeless?		
Not at all	129	26.1
several days	194	39.2
a majority of the days	96	19.4
Nearly every day	76	15.4
Have you been diagnosed with a psychiatric illness?		
Yes	70	14.1
No	425	85.9

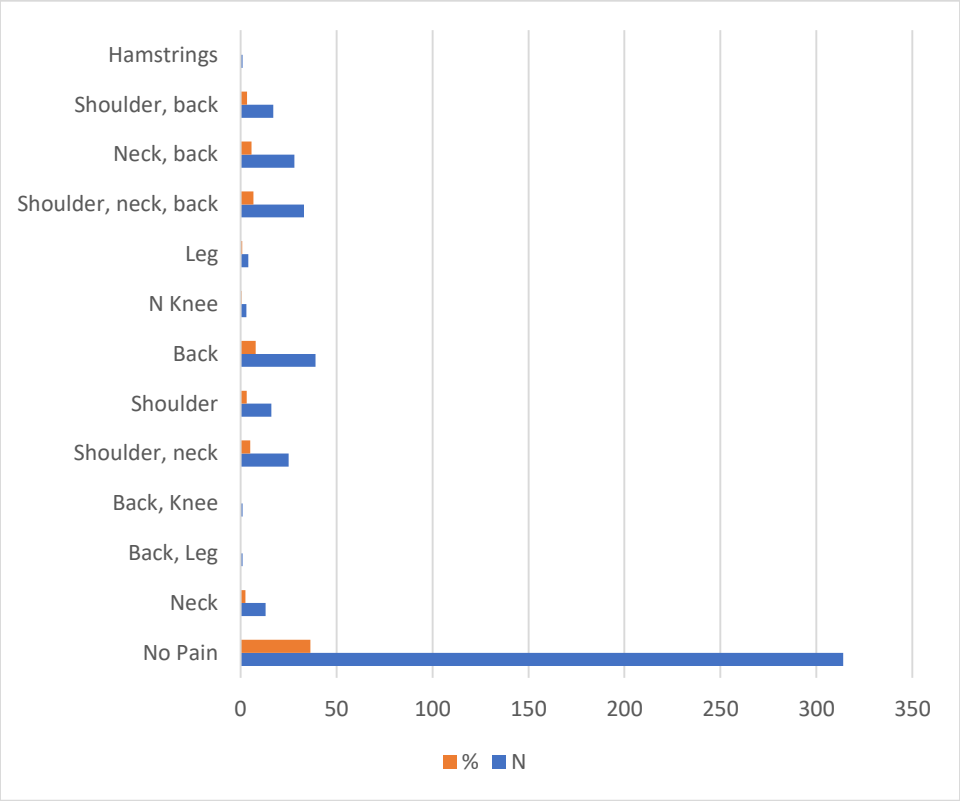

Figure 1 Site of the pain

Table 3 shows the comparison of MSP with different characteristics. Students with a GPA above 3.5 (218; 63.9%) from them declare that they do not have MSP and only (123; 36.1%) have MSP (P = 0.986). Students who exercised daily (41; 66.1%) do not have MSP but (21; 33.9%) have MSP even when they train daily, comparison to students who did not exercise at all (138; 59.0%) do not have MSP but (96; 41.0%) have MPS (P = 0.246). Students who sleep 6-8h (93; 37.8%) from them have MSP and (153; (62.2%) do not have MSP and among students who sleep more than 8h half of them (52; 70.3%) do not have MSP (P = 0.611). when we asked the students whowere diagnosed with psychiatric illness if they had MSP, more than half (48; 68.6%) declare that they do not have MSP but when we asked the students who do not diagnose with psychiatric illness if they have MSP more than the half (266; 62.6%) claim not to have MSP. Regarding the relationship between BMI and MSP students who were overweight half of them (49; 54.4%) do not have MSP and who were obese in class 1 almost all of them do not have MSP (24; 80.0%) and those who were obese class 2 more than the half (12; 70.6%) do not have MSP and who were obese class 3 only three of them had MPS (3; 37.5%) in comparison to underweight students (30; 36.6%) have MSP.

Table 3 Comparison of MSP with different characteristics

	Yes (%)	No (%)	P-value
GPA * Do you have Musculoskeletal (neck, shoulder, back,…) pain now?			
3.6-4	123 (36.1%)	218 (63.9%)	
3.1-3.5	47 (37.6%)	78 (62.4%)	0.986
2.6-3.0	10 (38.5%)	16 (61.5%)	
less than 2.5	1 (33.3%)	2(66.7%)	
How many times do you exercise in a week? * Do you have Musculoskeletal (neck, shoulder, back,…) pain now?			
daily	21 (33.9%)	41 (66.1%)	
twice per week	33 (34.0%)	64 (66.0%)	0.246
once per week	31 (30.4%)	71 (69.6%)	
not exercise at all	96 (41.0%)	138 (59.0%)	
How many hours do you sleep every day? * Do you have Musculoskeletal (neck, shoulder, back,…) pain now?			
less than 4 hours	10 (40.0%)	15 (60.0%)	
4-6h	56 (37.3%)	94 (62.7%)	0.611
6-8h	93 (37.8%)	153 (62.2%)	
More than 8h	22 (29.7%)	52 (70.3%)	
How frequently in the last two weeks has a lack of enthusiasm or enjoyment in doing things upset you? * Do you have Musculoskeletal (neck, shoulder, back,…) pain now?			
Not at all	35 (27.1%)	94 (72.9%)	
several days	77 (39.7%)	117 (60.3%)	0.033
a majority of the days	34 (35.4%)	62 (64.6%)	
Nearly every day	35 (46.1%)	41 (53.9%)	
How frequently have you been harassed during the previous two weeks by little interest or pleasure in doing things? * Do you have Musculoskeletal (neck, shoulder, back,…) pain now?			
Not at all	44 (34.1%)	85 (65.9%)	
several days	85 (39.0%)	133 (61.0%)	0.588
a majority of the days	34 (38.2%)	55 (61.8%)	
Nearly every day	18 (30.5%)	41 (69.5%)	
Have you been diagnosed with a psychiatric illness? * Do you have Musculoskeletal (neck, shoulder, back,…) pain now?			
Yes	22 (31.4%)	48 (68.6%)	0.352
No	159 (37.4%)	266 (62.6%)	
BMI groups Crosstabulation * Do you have Musculoskeletal (neck, shoulder, back,…) pain now?			
Underweight (<18.5)	30 (36.6%)	52 (63.4%)	
Normal (18.5–24.9)	94 (35.6%)	170 (64.4%)	
Overweight (25.0–29.9)	41 (45.6%)	49 (54.4%)	0.208
Obese class 1 (30.0–34.9)	6 (20.0%)	24 (80.0%)	
Obese class 2 (35.0–39.9)	5 (29.4%)	12 (70.6%)	
Obese class 3 (40 or more)	3 (37.5%)	5 (62.5%)	

4. DISCUSSION

This study investigates the prevalence of musculoskeletal pain among UQU medical students in Saudi Arabia, as well as how it is related to various causes and potential treatments. Several research examines the prevalence of MSP pain among medical students from different Saudi Arabian regions (Dighriri et al., 2019). Our study results showed that back pain was reported as the most common type of MSP. This outcome was validated by Dighriri et al., (2019), who conclude that low back pain was reported more

than neck or shoulder pain. Regarding the people who have MSP, this study revealed that pain affects studying time, but it doesn't affect daily tasks.Also, those students with MPS don't prefer to use medication for MSP, as (77.3%) of them don't take any medication for their MSP. The outcome of this research provides no significant correlation between high GPA and MSP. Furthermore, there is no significant correlation between BMI and MSP. This result is in contradiction with some studies which found a correlation between MSP and BMI (Rosa et al., 2021; Karaarslan et al., 2021).

The present study found a correlation between exercise and MSP, as the students who don't exercise at all are suffering from MSP more than others. In addition to the association between MSP and sleeping less than 4 hours. The findings of this study show that MSP and depressed symptoms differ significantly from one another. This finding is documented and reported to be the same as one of the earlier research (Dighriri et al., 2019). This study doesn't include people who have a history of musculoskeletal trauma. However, some studies showed a significant correlation between MSP and the history of trauma (Dighriri et al., 2019; Alshagga et al., 2013).

A frequent complaint is musculoskeletal pain that affects many people in the community, so primary healthcare needs to enhance health services for the management of musculoskeletal conditions by using a combination of medical interventions and increasing awareness of behavioral changes like exercise, weight management, and mental health. The results of this study will promote the quality of life through health services in Saudi Arabia in the future.

Limitations of this study

First, this study is cross-sectional, so it was hard to detect the causality and identify potential risk factors for each participant. Second, the data used in this study's analysis was self-reported, which could indicate systemic bias.

5. CONCLUSION

Musculoskeletal pain is a common complaint among medical students, and the risk factors include limited activity and inadequate sleep. However, by future medical interventions and increased knowledge of behavioral changes, we can manage musculoskeletal pain.

Author contribution

Osama Abdulrahman and AbdulazizAlsaedi developed the study concept, design, and literature review. Mahmoud Alshenqity and Ameen Alshenqity were responsible for the development and testing of the data collection tool as well as for data collection and data entry. Abdullah Eterji and Anas Al-Amodi were responsible for data analysis and prepared the final draft of the manuscript. Mokhtar Shatla supervised the research overall and revised the manuscript.

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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