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Back pain among medical students in Al Madinah Province, KSA

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ABSTRACT

Back pain is the main reason of reduced activity and productivity as well as decreased class attendance among college students. Therefore, it is crucial for medical school faculty to recognize the potentially modifiable back pain risk factors among their students and prepare early supportive and preventive interventional measures, especially when considering that back pain could affect students' mental health, physical health, and overall quality of life. This study aimed to estimate the prevalence of back pain among medical students in Al-Madinah Province in Saudi Arabia and investigate the factors associated with a higher prevalence of back pain. Using a self-reported questionnaire, this cross-sectional study collected data on back pain prevalence and associated risk factors. The survey was distributed through social media platforms. The chi-square test was used to identify risk factors significantly associated with back pain, and multivariate logistic regression was used to determine the risk factors for back pain among medical students. Data analysis from 712 participants showed that the overall prevalence of back pain among medical students in Al-Madinah Province in Saudi Arabia was 58.8%. Female sex was associated with a significantly higher prevalence of back pain (62.1%) than male sex (51.4%). Marital status, socioeconomic status, academic year, occupation, chronic diseases, and medication use were predictive of back pain, whereas neither age nor nationality significantly affected the prevalence of back pain.

Keywords: Back pain, Medical students, Prevalence, Stress, Saudi Arabia

1. INTRODUCTION

Back pain is a major cause of decreased activity and productivity as well as low-class attendance among college students and potentially affects the overall grades and, most importantly, the quality of life of students (Du, 2017). Medical school constitutes a stressful environment involving many long study hours, most of which is spent on computers (Alshammari et al., 2021). In addition, students must attend hospital-based clinical sessions. Although

considered modifiable risk factors for back pain, the factors mentioned above impair mental concentration, which plays an essential role in student learning in medical schools and the student's future careers. A study conducted among medical students at Jazan University revealed a very high prevalence of musculoskeletal pain (MSP) in the neck, shoulder, and lower back, of which low-back pain had the highest prevalence. The risk of MSP increased due to three main factors: history of trauma, depressive symptoms, and psychosomatic symptoms (Alzahrani et al., 2022).

Interventional procedures could be beneficial for increasing students' quality of life and improving their overall musculoskeletal health (Dighriri et al., 2019). Cigarette smoking, stress, and incorrect sleeping positions are associated with a high prevalence of back pain (Ilic et al., 2021), and an association between back pain and clinical training in medical school has been reported (Alshagga et al., 2013). In general, medical students have a more sedentary lifestyle than their peers who pursue physical education (Amelot et al., 2019). Thus, medical school faculty must recognize the probably modifiable risk elements for backpain among their students and institute early supportive and preventive intervention measures to improve the quality of life of medical students (Aggarwal et al., 2013).

Therefore, it is necessary to investigate the extent of low back pain in medical school students in Al Madinah, Kingdom of Saudi Arabia. Moreover, the type of teaching program that is implemented determines whether the students prepare most of their learning materials by using a device or a computer and, from the fourth year onwards, students are required to participate in practical training in the clinical setting, which allows them to engage more in physical activities. This study primarily aimed to know the degree of prevalence of back pain between medical students in Al Madinah medical schools and its relationship with gender.

2. MATERIALS AND METHODS

Study design

This cross-sectional questionnaire-based study was conducted from September to December 2021, which coincides with the commencement of the first academic semester that constitutes a stressful phase of the year for college students, in whom there could be inter individual differences in the degree of severity of back pain. The survey questionnaire was distributed across various social media platforms, including WhatsApp messenger, Telegram, and Twitter. Furthermore, all participants completed a consent form before filling out the survey questionnaire. All medical students in the Al Madinah province, including those from the Al Rayan and Taibah medical schools, were eligible for inclusion, whereas medical students in medical schools outside the Al Madinah province were excluded. In a 10-minute online 40-item questionnaire survey using Google Forms, 712 respondents responded to questions about the following aspects in relation to back pain: the sociodemographic and academic profile, pain characteristics, associated factors, and general health. The Biomedical Committee of Research Ethics at the faculty of medicine at Umm Al-Qura University has approved the study (Approval no. HAPO-02-K-012-2022-02-976).

Study instrument: Online survey questionnaire

The 40-item questionnaire was divided into three sections: Section A contained ten questions on the sociodemographic and academic profile; Section B contained 23 questions on pain characteristics; and Section C contained seven questions about general health. The online self-reported questionnaire comprised multiple-choice and dichotomous (yes/no) questions. The questionnaire was tested before distribution to 25 students in different levels, including both genders, and it was precise and reliable to all 25 participants.

Study variables

The impact of back pain between medical students in the Al Madinah province was investigated with regard to variables that were identified as risk factors, including age, sex, marital status, weight, height, academic year, occupation, medical school, sitting position while studying, study hours per day, sleeping position, health and nutritional status, socioeconomic status, physical activity, menstrual period, use of painkillers, and smoking.

Statistical analysis

Data analysis was performed by the use of the Statistical bundle for the Social Sciences, Version23. Categorical variables are displayed as frequencies and percentages. The chi-square test was used to test for associations between categorical variables. Multivariate logistic regression was used to determine the risk factors for back pain between medical students. The logistic regression model included the following variables: sex, marital status, academic year, and socioeconomic status, occupation other

than medical school, chronic disease, and use of medication/supplements, smoking status, and exercise. $P< 0.05$ was set as the level of significance.

3. RESULTS

In total, 712 (53.5% of all students) participants who provided complete questionnaires were included in this study. Table 1 displays the sociodemographic and academic profiles of the participants: 150 (21.1%), 407 (57.2%),132 (18.5%), and 23 (3.2%) participants were in the age groups of 18–20, 20–23, 24–25, and 26–30 years, respectively. The study cohort included 245 (34.4%) and 467 (65.6%) male and female participants, respectively. The majority of participants weighed between 40 and70 kg; 692 (97.2%) participants were Saudis whereas20 (2.8%) were non-Saudis; 662 (93%) participants were single, 45 (6.3%) were married, and five (0.7%) were divorced; 55 (7.7%), 460 (64.6 %), and 197 (27.7%) reported having moderate, good, and excellent socioeconomic status, respectively; 107 (15%), 189 (26.5%), 143 (20.1%), 145 (20.4%), and 128 (18%) participants were in the second, third, fourth, fifth, and sixth year, respectively, of medical school. There were 440 (61.8%) and 272 (38.2%)participants from Taibah University and Al-Rayan College, respectively, and 136 (19.1%) participants reported having an occupation other than medical school student (Table 1).

Table 1 Socio-Demographic and Academic Profile of the Participants (n = 712)

Demographical Characteristics	n	%
Age		
18 - 20 years	150	21.10
20 - 23 years	407	57.20
24 - 25 years	132	18.50
26 - 30 years	23	3.20
Gender		
Male	245	34.40
Female	467	65.60
Weight		
40 - 50 Kg	181	25.40
51 - 60 Kg	195	27.40
61 - 70 Kg	159	22.30
71 - 80 Kg	86	12.10
80 - 91 Kg	46	6.50
91 - 100 Kg	30	4.20
More than 100 Kg	15	2.10
Nationality		
Saudi	692	97.20
Non-Saudi	20	2.80
Marital Status		
Single	662	93.00
Married	45	6.30
Divorced	5	0.70
Socio-economic status		
Bad	55	7.70
Good	460	64.60
Excellent	197	27.70
Academic year		
Second year	107	15.00

Third year	189	26.50
Fourth year	143	20.10
Fifth year	145	20.40
Sixth year	128	18.00
University		
Taibah University	440	61.80
Al-Rayan Colleges	272	38.20
Do you have another occupation besides medical school?		
Yes	136	19.10
No	576	80.90

Prevalence of back pain between medical students

Among the participants, 416 (58.4%) reported back pain, whereas296 (41.6%) reported no back pain (Figure 1).

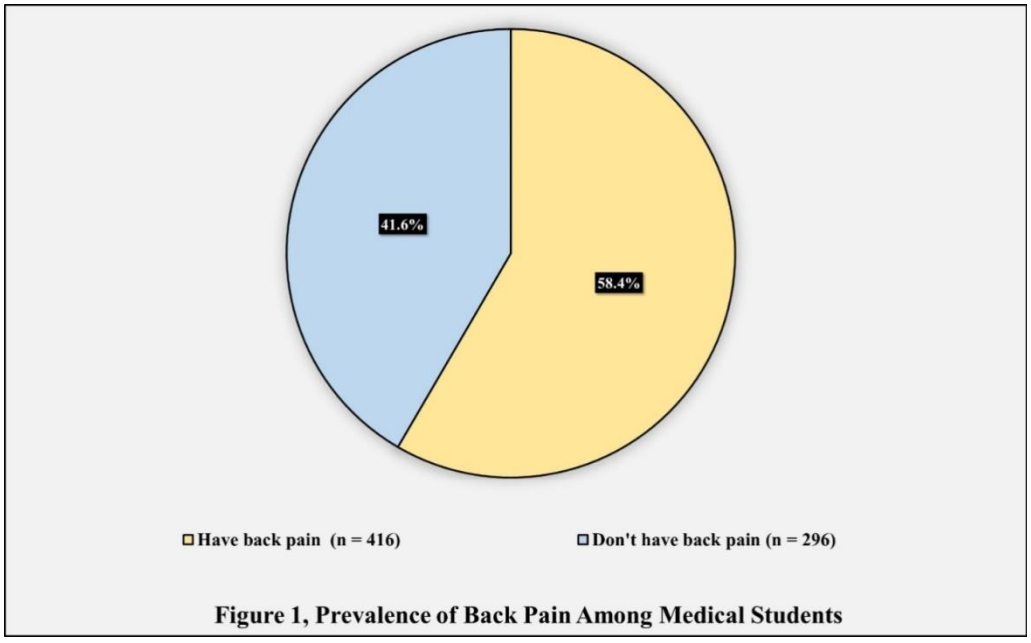

Figure 1, Prevalence of Back Pain Among Medical Students

Participants' perception of the causes of their back pain

The causes that were most frequently reported by the participants were unhealthy body posture while studying (n=293, 70.4%), working/studying on computers (n=218, 52.4%), unhealthy sleeping posture (n=166, 39.9%), and lifting heavy weights (n=106, 25.5%) (Figure 2). With regard to the time when back pain was experienced, the time that was most frequently reported by the participants was during studying (n=213, 51.2%), followed by the end of the day (n=192, 46.2%), in the morning (n=93, 22.4%), and while sleeping (n=86, 20.7%) (Figure 3). Responses to the nature of the back pain they experienced most commonly elicited reports of pain (n=227, 54.6%), stiffness (n=129, 31%), cramp/spasm (n=123, 29.6%), and a nagging feeling (n=78, 18.8%) (Figure 4).

In addition, the exercises that participants most commonly practiced were walking (n=341, 47.9%), working out in the gym (n=176, 24.7%), and running (n=134, 18.8%) (Figure 5). With regard to the duration of back pain, 79 (19%), 95 (22.8%), 65 (15.6%), 41 (9.9%), and 136 (32.7%) participants had back pain for <1 week, 1 week to 1 month, 1–3 months, 3–6 months, and >6 months, respectively. Among the participants, 296 (71.2%) reported that the pain started gradually, whereas 120 (28.8%) reported sudden-onset pain. The pain was constant and intermittent in 127 (30.5%) and 289 (69.5%) participants, respectively. The severity of back pain was graded as 1–3, 4–5, 6–8, and 9–10 by 129 (31.01%), 197 (47.36%), 79 (18.99%), and 11 (2.64%), respectively. In 205 (49.3%) participants, the pain improved with painkillers, whereas 107 (25.7%) and 104 (25%) participants reported that the pain either did not or sometimes did resolve with painkillers, respectively (Table 2).

Participant-reported factors associated with back pain

Back pain was associated with physical activity, particular sitting position, long study hours, study position, study place, carrying backpacks, long-time studying on computers, standing for long duration, and a particular sleeping position in 205 (49.3%),331 (79.57%), 370 (88.94%), 273 (65.63%), 266 (63.94%), 160 (68.46%), 301 (72.36%), 267 (64.18%), and 240 (57.69%) participants, respectively. Among women, 165 (35.3%) participants reported that the back pain they are having was associated with their menstrual period (Table 3).

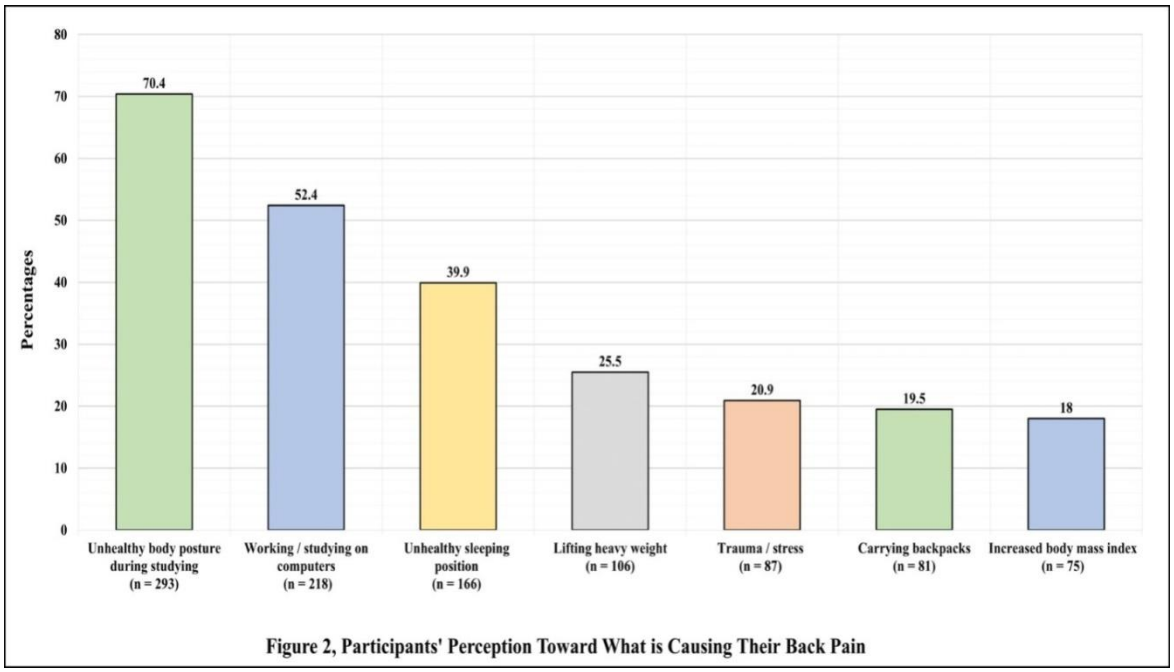

Figure 2, Participants' Perception Toward What is Causing Their Back Pain

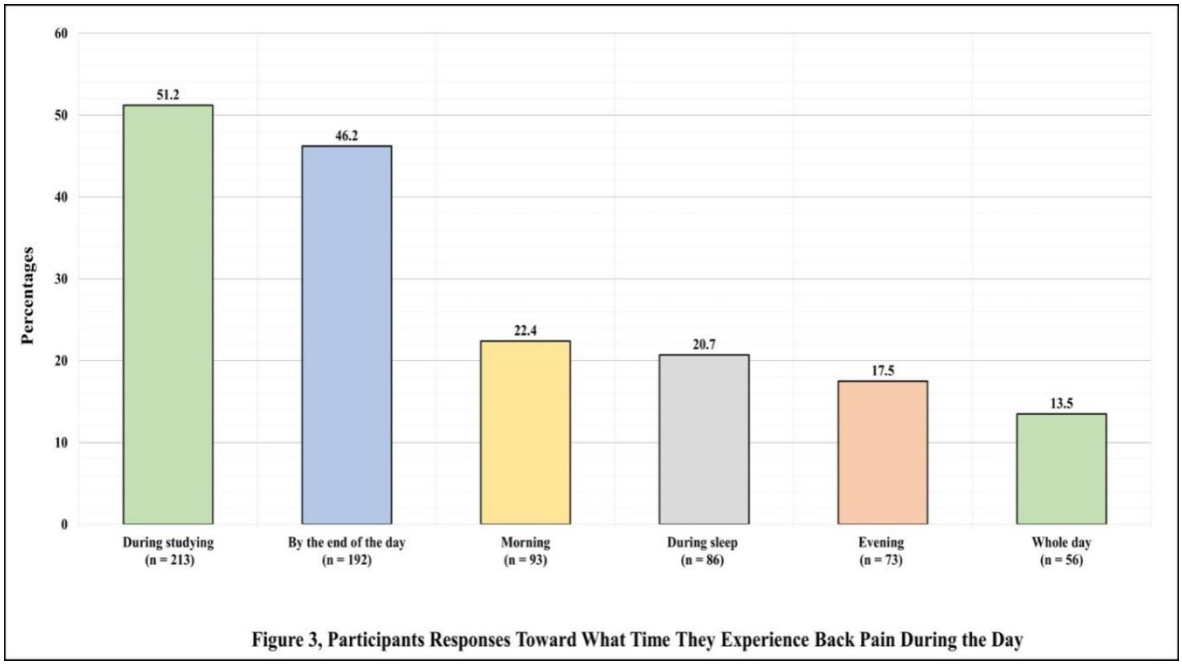

Figure 3, Participants Responses Toward What Time They Experience Back Pain During the Day

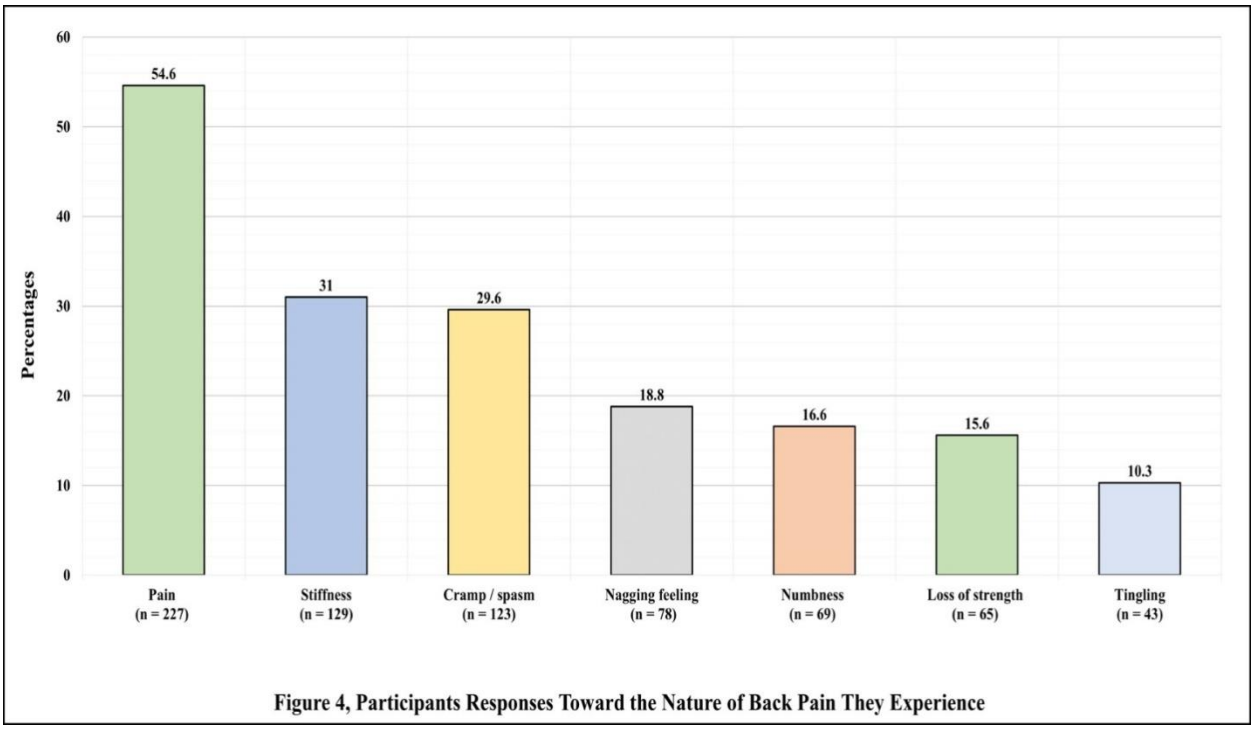

Figure 4, Participants Responses Toward the Nature of Back Pain They Experience

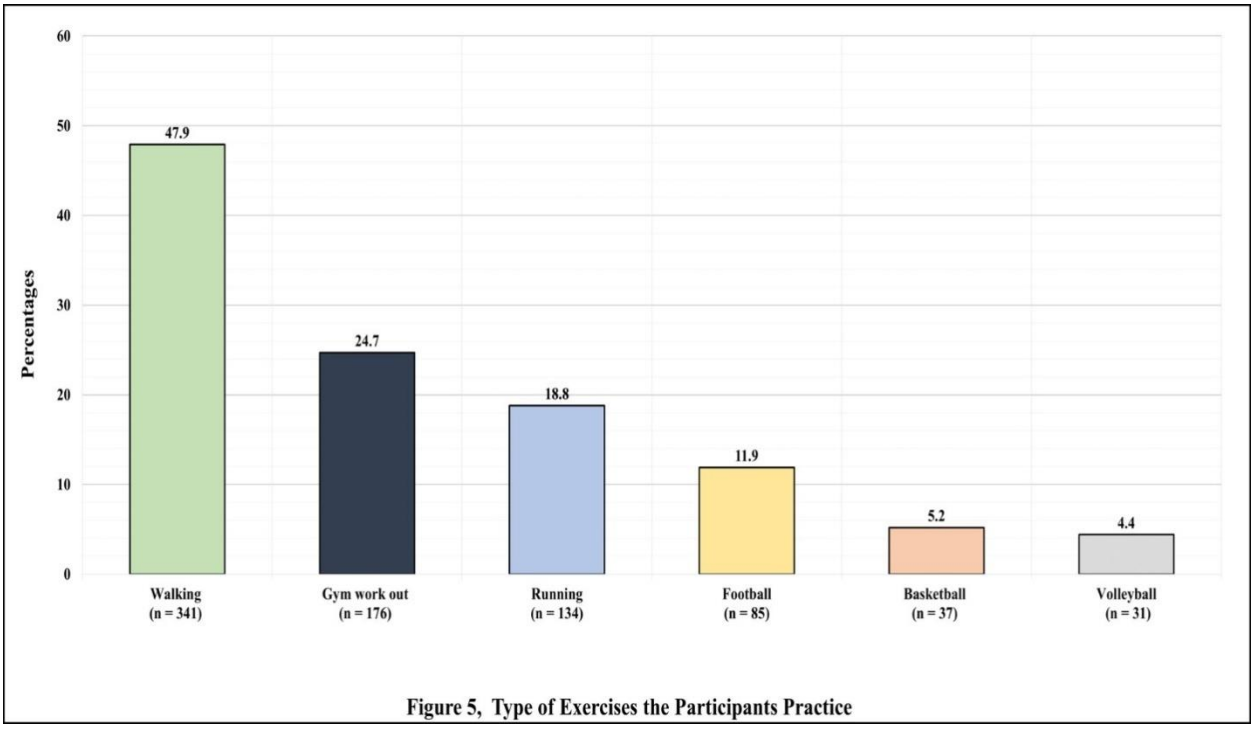

Figure 5, Type of Exercises the Participants Practice

Table 2 Back Pain Profile (n = 416)

Question	n	%
Q1/ From how long you have back pain?		
1 week	79	19
1 week - 1 month	95	22.8
1 - 3 months	65	15.6
3 - 6 months	41	9.9
More than 6 months	136	32.7

Q2/ How did the pain start?		
Gradually	296	71.2
Suddenly	120	28.8
Q3/ Behavior of pain		
Constant	127	30.5
Intermittent	289	69.5
Q4/ From 1-10 how severe is your back pain?		
1 - 3	129	31.01
4 - 5	197	47.36
6 - 8	79	18.99
9 - 10	11	2.64
Q4/ Does the pain becomes better with using pain killer?		
Yes	205	49.3
No	107	25.7
Sometimes	104	25

Table 3 Participants Reports on Factors Associated with the Back Pain they Experience (n = 416)

Question	n	%
Participants Reports on Factors Associated with Back Pain		
1/ Is the pain associated with physical activity?		
Yes	205	49.30
No	107	25.70
Sometimes	104	25.00
2/ Is the pain associated with a particular sitting position?		
Yes	331	79.57
No	85	20.43
3/ Is the pain associated with long time studying hours?		
Yes	370	88.94
No	46	11.06
4/ Is the pain associated with a particular studying position?		
Yes	273	65.63
No	143	34.38
5/ Is the pain associated with a particular studying place?		
Yes	266	63.94
No	150	36.06
6/ Is the pain associated with carrying backpacks?		
Yes	160	38.46
No	155	37.26
Sometimes	101	24.28
7/ Is the pain associated with long time studying on computers?		
Yes	301	72.36
No	44	10.58
Sometimes	71	17.07
8/ Is the pain associated with long time standing?		
Yes	267	64.18
No	83	19.95

Sometimes	66	15.87
9/ Is the pain associated with a particular sleeping position?		
Yes	240	57.69
No	176	42.31
10/ If you are a female, Is the pain associated with your menstrual period?		
Yes	165	35.30
No	244	52.20
Sometimes	58	12.40

Participant-reported influence of back pain on overall health status

With regard to the influence of back pain, 146 (35.1%), 146 (35.1%), 136 (32.69%), and 226 (54.33%) reported that back pain affected their daily life, social life, grades, and sleep, respectively. The general health status was reported as bad, good, and excellent by 67 (9.41%), 466 (65.45%), and 179 (25.14%) participants, respectively. The nutritional status was poor and good in 139 (19.52%) and 472 (66.29%) participants, respectively, whereas 101 (14.19%) participants reported excellent nutritional status. Among the participants, 173 (24.3%) were smokers, 98 (13.76%) had a chronic disease, and 242 (33.99%) used medications or supplements. With regard to exercise, 214 (30.06%), 313 (43.96%), 146 (20.51%), and 39 (5.48%) reported no exercise, exercise 1–3 times a week, 4–5 times a week, and more than 5times a week, respectively (Table 4).

Table 4 Participants Reports on the Influence of Back Pain on Participants and the Overall Health Status of Participants (n = 416)

Question	n	%
Participants Reports on the Influence of Back Pain on Participants		
1/ Does the back pain affect your daily activity?		
Yes	146	35.10
No	127	30.53
Sometimes	143	34.38
2/ Does the back pain affect your social life?		
Yes	146	35.10
No	270	64.90
3/ Does the back pain affect your overall grades?		
Yes	136	32.69
No	280	67.31
4/ Does the back pain affect your sleep?		
Yes	226	54.33
No	190	45.67
Participants Reports on the Influence of Back Pain on Participants		
1/ How is your health status in general?		
Bad	67	9.41
Good	466	65.45
Excellent	179	25.14
2/ How is your nutritional status?		
Bad	139	19.52
Good	472	66.29
Excellent	101	14.19
3/ Do you smoke?		
Yes	173	24.30
No	539	75.70
4/ Do you have any chronic diseases?		

Yes	98	13.76
No	614	86.24
5/ Are you taking any medications or supplements?		
Yes	242	33.99
No	470	66.01
6/ How many times do you exercise per week?		
1-3 times per week	313	43.96
4-5 times per week	146	20.51
More than 5 times per week	39	5.48
Never	214	30.06

Factors associated with back pain

Sex was significantly associated with back pain ($p = 0.006$), as women had a higher level of occurrence of back pain than men (62.1% vs. 51.4%). Moreover, marital status was significantly associated with back pain ($p = 0.017$), with single patients having the lowest prevalence of back pain, followed by married and divorced patients. Socioeconomic status was significantly inversely associated with back pain ($p< 0.001$): the better the socioeconomic status, the less the prevalence of back pain. Furthermore, the academic year was found to be highly associated with back pain ($p = 0.017$); participants in their second year had the highest rate of back pain, whereas those in the third year had the lowest rate of back pain. Similarly, having an occupation other than medical school was significantly associated with back pain ($p< 0.001$); participants with another occupation had a higher rate of back pain than those who did not (75% vs. 54.5%). Smoking, chronic disease, and medication/supplement use were all significantly associated with back pain ($p = 0.001$, $p< 0.001$, and $p< 0.001$, respectively). It was observed that those who were mentioned in the previous groups had a higher rate of back pain than those who were not mentioned.

Multivariate logistic regression was used to determine the risk factors of back pain between medical students. The logistic regression model included the following variables: sex, marital status, academic year, and socioeconomic status, occupation other than medical school, chronic disease, and use of medication/supplements, smoking status, and exercise. The following factors predicted a higher incidence of back pain: chronic disease ($p = 0.025$, odds ratio [OR] = 1.64), use of medication/supplements ($p = 0.032$, OR = 1.94), and smoking status ($p = 0.018$, OR= 1.57). The following factors predicted a lower incidence of back pain: male sex ($p< 0.001$, OR= 0.41), being in the third year of medical school ($p = 0.026$, OR= 0.55), having a good socioeconomic status ($p = 0.004$, OR= 0.23), and having an excellent socioeconomic status ($p< 0.001$, OR= 0.15) (Table 5).

Table 5 Factors Associated with Back Pain

Factor	Status of Back Pain Among Participants		P-Value
	Have Back Pain	Don't have Back Pain	
Age			
18 - 20 years	92 (61.3%)	58 (38.7%)	
20 - 23 years	227 (55.8%)	180 (44.2%)	
24 - 25 years	81 (61.4%)	51 (38.6%)	0.342
26 - 30 years	16 (69.6%)	7 (30.4%)	
Gender			
Male	126 (51.4%)	119 (48.6%)	0.006*
Female	290 (62.1%)	177 (37.9%)	
Nationality			
Saudi	401 (57.9%)	291 (42.1%)	0.127
Non-Saudi	15 (75%)	5 (25%)	
Marital Status			
Single	378 (57.1%)	284 (42.9%)	
Married	33 (73.3%)	12 (26.7%)	0.017*
Divorced	5 (100%)	0 (0%)	
Socio-economic status			

Bad	50 (90.9%)	5 (9.1%)	< 0.001*
Good	270 (58.7%)	190 (41.3%)	
Excellent	96 (48.7%)	101 (51.3%)	
Academic year			0.017*
Second year	71 (66.4%)	36 (33.6%)	
Third year	96 (50.8%)	93 (49.2%)	
Fourth year	94 (65.7%)	49 (34.3%)	
Fifth year	87 (60%)	58 (40%)	
Sixth year	68 (53.1%)	60 (46.9%)	
University			0.206
Taibah University	249 (56.6%)	191 (43.4%)	
Al-Rayan Colleges	167 (61.4%)	105 (38.6%)	
Do you have another occupation besides medical school?			< 0.001*
Yes	102 (75%)	34 (25%)	
No	314 (54.5%)	262 (45.5%)	
Do you smoke?			0.001*
Yes	120 (69.4%)	53 (30.6%)	
No	296 (54.9%)	243 (45.1%)	
Do you have any chronic diseases?			< 0.001*
Yes	79 (80.6%)	19 (19.4%)	
No	337 (54.9%)	277 (45.1%)	
Are you taking any medications or supplements?			< 0.001*
Yes	170 (70.2%)	72 (29.8%)	
No	246 (52.3%)	224 (47.7%)	
How many times do you exercise per week?			0.804
1-3 times per week	188 (60.1%)	125 (39.9%)	
4-5 times per week	82 (56.2%)	64 (43.8%)	
More than 5 times per week	21 (53.8%)	18 (46.2%)	
Never	125 (58.4%)	89 (41.6%)	
*Significant at level 0.05			

4. DISCUSSION

This study assessed the prevalence and investigated the predictive factors of back pain between medical students in Saudi Arabia. The association between being a medical student and having MSP has been well established in the literature (Du, 2017; Dighriri et al., 2019; Ilic et al., 2021; Alshagga et al., 2013; Amelot et al., 2019; Aggarwal et al., 2013). In this study, 58.4% of medical students mentioned that they have back pain, whereas the remaining 41.6% did not report back pain. In previous international studies, the prevalence of back pain between medical students was from very low to very high, with the lowest rate of 13% reported in Pakistan (Hafeez et al., 2013) and the highest rate of 81.7% in Brazil (Tavares et al., 2019). Additional studies showed various findings, where the level of occurrence of back pain between medical students was 17.9% in China (Smith et al., 2005), 20.8% in Serbia (Ilic et al., 2021), and 48% in India (Aggarwal et al., 2013).

Moreover, the level of occurrence of back pain between medical students from different regions of Saudi Arabia varies. Back pain was prevalent in 33% of medical students in Taif and 61.4% of medical students in Jazan (Hafeez et al., 2013; Tavares et al., 2019; Smith et al., 2005; Alturkistani et al., 2020). This variation in the level of occurrence of back pain at the international or national level may be partly attributed to geographical factors. For example, sharing a specific lifestyle, dietary habits, weather, socioeconomic status, and genotypes may promote the degree of occurrence of back pain in some nations more than in others. Furthermore, different studies used different data collection modalities, inclusion criteria, and exclusion criteria, explaining why back pain is highly prevalent in some areas yet relatively rare in others.

This study observed a significant association between second-year medical students and back pain. This correlation is consistent with the study results by Alturkistani et al., (2020) where back pain was reported most frequently by second-year medical students. However, it contradicts the findings of Alshagga et al., (2013) and Aggarwal et al., (2013) and Algarni et al., (2017) where the level of occurrence of back pain between medical students progressively increased over medical school years and was highest in the final year. This association was previously attributed to prolonged periods of sitting during lectures and laboratory sessions, which distorts body posture and eventually causes back pain (Alturkistani et al., 2020). Additionally, we assume that incorrect study positions, extended time spent using computers, and carrying a heavy backpack during the early years of medical school are contributory factors. Finally, the amount of stress experienced by students during the second year might be the highest, and therefore, back pain is most prevalent at such times.

Tavares et al., (2019) and Smith et al., (2004) reported that back pain is more frequent in women than men. They thus proposed a significant association between sex and back pain. This correlation is consistent with our study's findings, wherein back pain was observed more frequently in females than in male medical students. Although the precise cause underlying women's tendency to develop back pain is unknown (Ozcan Kahraman et al., 2018), a possible reason could be that women have decreased pain threshold and their tendency to magnify the stress they go through could tense the body muscles and subsequently lead to back pain. Moreover, pain during the menstrual cycle, which is a typical experience in females and is virtually experienced by nearly all females, might radiate to the back, thereby increasing the overall level of occurrence of back pain between female students than in male students.

No significant association between exercise and back pain was noted in this study, regardless of the type of physical activity or the number of times the participants exercised per week. This is consistent with Tavares et al., (2019) and Al Shayhan and Saadeddin (2018), wherein physical activity did not affect the prevalence of back pain among medical students (Dighriri et al., 2019; Ilic et al., 2021). Nevertheless, the above mentioned finding is inconsistent with the study results by Amelot et al., (2019) which found that 30 minutes of exercise daily is a protective factor against back pain. Theoretically, this association's mechanism might be related to endorphin secretion during exercise, which reduces pain perception and enhances mood. However, the presence of contradictory findings leaves the path open for future researchers to investigate further the effect of physical activity on back pain.

Our study found that neither age nor nationality affected the level of occurrence of back pain, as no significant difference in the prevalence of back pain was observed among students from different age groups and between Saudi and non-Saudi students. Conversely, marital and socioeconomic status significantly affected the prevalence of back pain, as students who were married, divorced, or had relatively poor socioeconomic status reported back pain more commonly than single students and those with better socioeconomic status. This correlation might be related to the amount of stress accompanying the circumstances associated with being married or divorced and having poor socioeconomic status, which ultimately may manifest as MSP, including back pain.

A significant association between back pain and having chronic diseases or another occupation, besides being a medical student, was noted in this study, and might be due to the increasing mental and physical demands of comorbidities and occupations imposed on students, which could promote inflammation, cause fatigue, and lead to depression, thereby manifesting as MSP, such as back pain, or other nonspecific complaints. In addition, medication use was significantly associated with back pain in this study. However, the types of medications the participants used and whether taking medications was secondary to having back pain or whether having back pain ensued from taking those medications is unknown. These questions are worth investigating in future studies, especially when considering the large proportion of students who regularly consume some medications or supplements. It is controversial whether smoking affects the level of occurrence of back pain. Studies by Shiri et al., (2010) Alkherayf and Agbi (2009) all identified smoking as an independent risk factor of back, whereas Dighriri et al., (2019) and Tavares et al., (2019) found no significant association between smoking and back pain.

However, in the present study, tobacco use was significantly associated with a higher level of occurrence of back pain. Previous literature has suggested several mechanisms concerning the mechanism whereby smoking may lead to back pain, including reduced nourishment of the vertebral disc secondary to vasoconstriction and disc herniation due to chronic cough (Shiri et al., 2010; Alkherayf et al., 2010). In addition to the previously suggested mechanisms, we presume that smoking is associated with several possible risk factors for back pain, including sedentary lifestyle and unhealthy dietary habits, which may contribute to the higher prevalence of back pain among smokers.

This study had some limitations that should be avoided in future studies. First, the data were collected from one region in the Kingdom of Saudi Arabia. Therefore, the study result might be biased and may not be generalizable to the whole country or internationally. Furthermore, the data were collected via a self-reported questionnaire, which yielded less accurate results. Finally, many factors have been shown to affect the prevalence of back pain, including caffeine consumption, positive family history, and

depression (Wong et al., 2021), were not investigated. A future study investigating all identified risk factors for back pain would yield more accurate results and identify the extent to which each factor could influence the level of occurrence of back pain.

5. CONCLUSION

Finally, the overall prevalence rate of back pain between medical students in Al-Madinah Province in Saudi Arabia was 58.4%. In addition, sex, marital status, socioeconomic status, academic year, occupation, chronic disease, and medications were significantly associated with back pain. No significant association was found between back pain and age, nationality, or physical activity. A study of the level of occurrence of back pain and its predictive factors with data from several colleges of medicine from different regions of Saudi Arabia could yield more accurate findings that can be generalized to the whole country. Future researchers should include and investigate all the risk factors identified for back pain in previous studies to predict how each factor can influence the level of occurrence of back pain.

Author contribution

Fahad S. Alshehri, Abdullah Ali Alalawi, Yaser Khaled Zaitouni, Abdulmalik Marwan Arabi, Mohammed Ahmed Aljohani, Mohammad Mahmoud Alnakhli, Mohammed Noor Alharbi, Magdy El Barbaryparticipated in protocol design, data collection, analyzed the data, and the study. All authors reviewed the approved the final manuscript.

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Ethical approval

The study was approved by The Biomedical Committee of Research Ethics at the faculty of medicine at Umm Al-Qura University (HAPO-02-K-012-2022-02-976).

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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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