

Prevalence of Lower Back Pain and its Relation to Stress Among medical Students in Jeddah, Saudi Arabia

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ABSTRACT

BACKGROUND: Lower back pain (LBP) has become one of the serious issues globally. Medical students and their highly demanding programs made them more liable for LBP, which may reflect their academic performance and mental health. Still, not enough studies discussed this topic in the middle east region. This study aimed to estimate and measure LBP's prevalence and its relation to stress among medical students in Saudi Arabia.

METHOD: A cross-sectional study conducted among medical students from second to the sixth year from the following colleges in Jeddah city: KAU, ISNC, FCSM, KSAU, BMC, JU. A pre-validated questionnaire, including the "Nordic Musculoskeletal Questionnaire" and "Kessler Psychological Distress Scale," was distributed through social media.

Data were analyzed by SPSS version 25. A p-value of < 0.05 was considered statistically significant, and 95% confidence interval (CI).

RESULTS: A total of 452 participants filled the questionnaire. The mean age was (21.62 ± 1.877) . (68.1%) Participants had complained about LBP during the last 12 months, with a significant association between the prevalence of LBP and gender ($p = 0.001$). The majority of females who complained of LBP (75%) had severe stress disorder scores by the K10-scale. Normal BMI students had a higher prevalence of LBP more than others, although there was a positive correlation between the prevalence of LBP and BMI ($r = 0.188$).

CONCLUSION: Medical students have a high prevalence of LBP, interfering with their daily function and mental health. LBP may be one of the causes of depression and anxiety in this population. We recommend that college facilities include an indoor gym to encourage students to exercise and provide an academic adviser for each student, to help students deal with their stress so that they can perform better in their studies and social lives.

Key words: Medical students; Pain; Exercises; Lower back pain (LPB); Stress

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INTRODUCTION

The most prevalent health problem is lower back pain (LBP). According to the American Academy of Family Physicians (AAFP), the lower back pain defined as pain in the area between the last thoracic rib and above the inferior gluteal fold^[1,2]. Mostly LBP caused by unhealthy work-life balance amongst all ages, and so it is not only restricted to the elderly^[3]. Accordingly, to the study done by Global Burden of Disease (GBD) in 2018, musculoskeletal conditions were considered as the second-highest contributor to global disability. The same report indicated that lower back pain is the single leading cause of disability globally^[4,5]. Therefore, up to 40 % of adolescents suffer from LBP, as they reported limitations in day activities^[6]. However, one of the main reasons for mental stress and irritability is LBP^[7]. The

new lifestyle of medical students makes them more prone to having LBP^[8,9]. Throughout investigating previous studies, shows a primary consideration of LBP and its risk factor found to be lousy posturing, lack of exercise, being overweight, smoking, and family history^[9]. In the literature, a study at an Austrian medical school declared that the incidence of LBP among medical students was 53%^[8]. Another study at medical college in Belgrade points out that psychological tension, incorrect body posture may act as aggravators of LBP in 34.2% of medical students^[10]. Wrong posture, overweight, unhealthy lifestyle, and heavy backpacks were also associated with a high risk of LBP^[11]. Commonly, medical students exposed to long periods of study in their exams, their clinical rotation, and the usage of computers for a long time is the cause factors to LBP. Also, students who have a little sleep, not doing any workout, are more exposed to have LBP^[12]. However, the most important factors that favor LBP occurrence and its transformation to chronic are stressors, fear of pain, and decreased physical activity^[13,14].

Based on reviewing previous studies, we could not find any research study regarding lower back pain in Jeddah, Saudi Arabia among medical students. Consequently, this study aims to measure the prevalence of lower back pain and its relation to stress among medical students in Jeddah, Saudi Arabia.

METHODOLOGY

After acquiring ethical approval from Institutional Review Boards at Fakeeh College, a cross-sectional study was conducted randomly among medical students in Jeddah, Saudi Arabia, from different medical schools. For a duration from July to August 2020. Regarding the participants, the study included medical students, Saudi and non-Saudi beginning from the second year till the sixth year targeted randomly at the Medicine department of the listed facilities, King Abdul-Aziz University, Batterjee Medical College, Ibn Sian National College, Soliman Fakeeh Medical College, King Saud bin Abdul-Aziz University and Jeddah university. However, it excluded any participant who has a history of LBP due to back injury, back surgery, congenital back deformity, or any medical condition that can manifest as LBP. The sample size was 452 for this study. The Valid Questionnaire consisted of three sections: (1) **Section 1:** demographic data that was limited to (age, gender, academic year, weight, height, smoking, marital status, chronic diseases); (2) **Section 2:** focused on LBP that was done by the Nordic Musculoskeletal Questionnaire^[15]; (3) **Section 3:** evaluate the degree of distress using the K10 Scale^[16]. That contains ten questions about emotional states, each with a five-level scale, ranging from score 5 (all of the time) to score 1 (none of the time). The total scores are graded between 10-50: (1) Scoring 10-19 (probably to be well); (2) 20-24 (suggest having mild disorder); (3) 25-29 (suggest having moderate disorder); (4) 30-50 (suggest having severe disorder)^[17].

We use the Statistical Package of Social Sciences (SPSS) program version 25 for statistical analyses. A p-value of < 0.05 was considered statistically significant, and 95% confidence interval (CI). The continuous variables were shown as mean ± standard deviation, and categorical variables were expressed as percentages. The t-test was used for continuous variables, and the Chi-square test was used for categorical variables.

RESULTS

Students' Characteristics

A total of 452 students responded to our survey. Mean age was 21.62 (SD ± 1.877) years ranging from 18 to 30 years. Majority of

participants were females (n = 313; 69.2%) and (n= 139; 30.8%) were males as shown in figure 1. The participants of students were:(n = 97; 21.5%) in second year of training, (n = 82; 18.1%) in third year of training, (n = 138; 30.5%) in fourth year of training, (n = 72; 15.9%) in fifth year of training, and (n= 63; 13.9%) in sixth year of training at medical school. 74 (16.4%) of students were considered to be underweight, with a body mass index (BMI) less than 18 .5 kg/m², while (n = 71; 15.7%) of students were considered to be overweight, with BMI more than 24.9 kg/m², and (n = 62; 13.7%) of students were considered to be obese with BMI more than 30 kg/m². The participants of students who smokers were (n = 56; 12.4%) while no smokers were (n = 396; 87.6%). Demographic characteristics of responders are shown in Table 1.

Activity & chronic disease

In our results, (n = 126; 27.9 %) of students never practice sport activities, as expressed in figure 2. The most common sports were walking (n = 143; 31.6%) and the second frequent sports were cardio (n = 65; 14.4%). The prevalence of the chronic disease in our serious was Asthma (n = 27; 6%). Chronic disease was significantly associated with LBP's first question (p = 0.015), as expressed in Table 2. Furthermore, there was a negative correlation between stress and LBP in the 1st question r = -0.093, 2nd question r = -0.125, 3rd question r = -0.178, 4th question r = -0.231, negative correlation means the increase in stress will reduce LPB and vice versa.

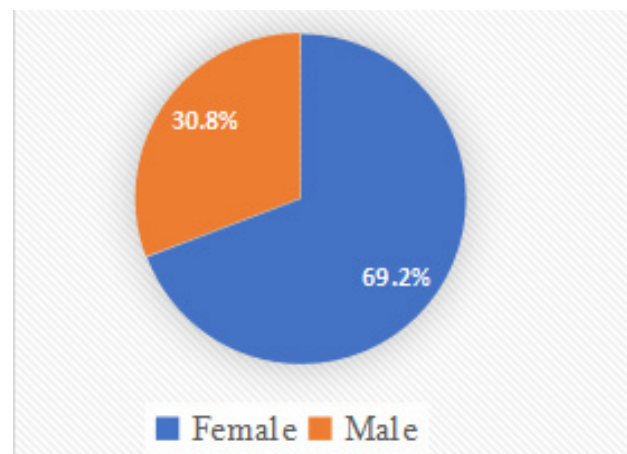


Figure 1 Number of participants.

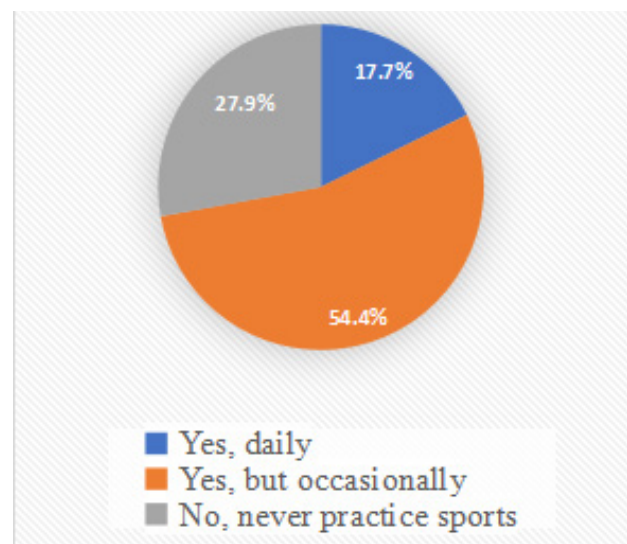


Figure 2 Do you practice sports.

Table 1 Association between lower back pain and general characteristics.

Demographic Data			Questions of LBP				
Characteristics	Attributes	Frequency		Q1	Q2	Q3	Q4
Age	Mean ± STD	21.62 ± 1.877	Yes (%)	308 (68.1%)	71 (15.7%)	121 (26.8%)	166 (36.7%)
Gender	Male	139 (30.8%)	No (%)	144 (31.9%)	381 (84.3%)	331 (73.2)	286 (63.3)
	Female	313 (69.2%)	P-Value	0.001	0.135	0.01	0.071
Academic year	Second	97 (21.5%)		> 0.05			
	Third	82 (18.1%)					
	Fourth	138 (30.5%)					
	Fifth	72 (15.9%)					
	Sixth	63 (13.9%)					
GPA	Mean ± STD	-----		> 0.05	0.036	0.001	> 0.05
Smoking	Yes	56 (12.4%)		> 0.05			
	No	396 (87.6%)					
BMI	Mean ± STD	23.71 ± 6.77		0.034	> 0.05		
	Under-weight	74 (16.4%)					
	Normal BMI	245 (54.2%)					
	Over-weight	71 (15.7%)					
	Obese	62 (13.7%)					
Practice sports	Walking	143 (31.6%)		> 0.05	0.001	> 0.05	0.003
	Cardio exercise	65 (14.4%)					
	Running	60 (13.3%)					
	Body building	33 (7.3%)					
	Swimming	16 (3.5%)					
	Boxing	9 (2%)					
	Never practice	126 (27.9)					
Chronic Diseases	Asthma	27 (6%)		0.015	> 0.05		
	Anemia	17 (3.8%)					
	DM	5 (1.1%)					
	MS	4 (0.9%)					
	PCOS	3 (0.7%)					
	Rheumatoid arthritis	3 (0.7%)					
	Hypothyroidism	3 (0.7%)					
	No chronic disease	390 (86.3%)					
Number of hours sitting during study*	Mean ± STD	5.9 ± 3.03		0.05			

Q1: Have you at any time during the last 12 months had trouble (such as ache, pain, discomfort, numbness) in LB. Q2: During the last 12 months have you seen a physician for this condition (LB). Q3: During the last 12 months have you been prevented from carrying out normal activity (e.g., job, housework, hobbies) because of this trouble in LB. Q4: During the last 7 days have you had trouble in LB. * Values in age, body mass index (BMI) and numbers of hours sitting during study are expressed as mean ± standard deviation (SD), and others are expressed as percentages (%). *LB: Lower back * P-value < 0.05 indicate significant relation. * Number of hours sitting during study by one-way ANOVA test.

Predictive Factors Associated with LBP

The prevalence of low-back pain (LBP) in the first question was ($n = 308$; 68.1%) of student suffered during last 12 months of lower back pain, the second question of LBP was variable: ($n = 71$; 15.7%) of students seen a physician for LBP, third question ($n = 121$; 26.8%) of students have been prevented from normal activities because of lower back trouble, and the fourth question ($n = 166$; 36.7%) of students during the last seven days had a trouble in Lower back. The overall prevalence of LBP of the time of occurrence was significantly associated with gender ($p = 0.01$) in the first and third questions. There was a significant association between LBP and age ($p = 0.034$); also, there was a significant association with body mass index (BMI) ($p = 0.034$) in the first question. Moreover, the relation between BMI and LBP was positive correlation $r = 0.125$, which means when the BMI increase will increase LBP although, we found the normal BMI in our result was the highest association with LBP, as shown in figure 5. The academic year was not significantly associated with any LBP at

any time ($p > 0.05$) regardless of 4th-year medical students was the most complaining of LBP in the last 12 months, as shown in figure 4. There was a significant association between the prevalence of LBP and GPA in the second and third questions ($p = 0.036$, $p = 0.001$). Smoking was not significantly associated with LBP ($p > 0.05$). Moreover, there was a significant association between LBP and practice sports in the second and fourth questions ($p = 0.001$, $P = 0.003$). At the same time, there was no significant association between sports and LBP in the first and third questions ($p > 0.05$), as shown in Table 1. Additionally, there was a negative correlation between sports and LBP in the 1st question $r = -0.104$, 2nd question $r = -0.135$, 3rd question $r = -0.065$, 4th question $r = -0.028$, negative correlation means increased sports performance reduces LBP vice versa.

Therefore, there was a significant association between the prevalence of LBP and the total score of stress in second, third, fourth questions ($p = 0.001$). On the other hand, the first question of LBP was not significantly associated with stress ($p = 0.096$). However, the

Table 2 Association between K10 scale and other variables by Chi-Square test

Characteristics	Attributes	K10 Scale			
		Likely To Be Well	Suggest Having a Mild Disorder	Suggest Having a Moderate Disorder	Suggest Having a Severe Disorder
Mean ± STD		23.68 ± 8.2			
Frequency (%)		153 (33.8%)	100 (22.1%)	88 (19.5%)	111 (24.6%)
Q1	P-Value	> 0.05			
Q2		0.001			
Q3					
Q4					
Gender		> 0.05			
Academic year					
GPA		0.04			
Smoking		0.006			
BMI		0.023			
Practice sports		0.036			
Chronic Diseases		> 0.05			
Number of hours sitting during study*		> 0.05			

Q1- Have you at any time during the last 12 months had trouble (such as ache, pain, discomfort, numbness) in LB.

Q2- During the last 12 months have you seen a physician for this condition (LB).

Q3- During the last 12 months have you been prevented from carrying out normal activity (e.g. job, housework, hobbies) because of this trouble in LB.

Q4- During the last 7 days have you had trouble in LB.

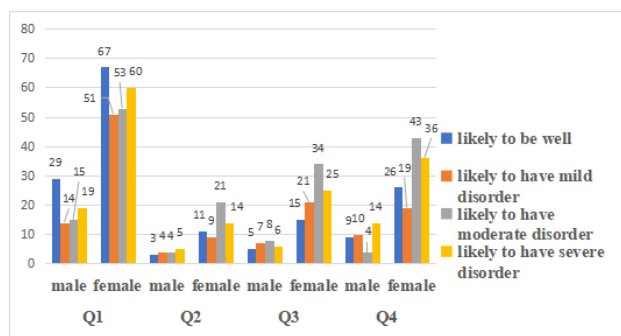


Figure 3 Lower back pain and it's association with stress.

associated total stress with the prevalence of LBP in the females was the highest score than males, and it was 60 (75.9%) of females had severe stress disorder in the first question while males 19 (24.1%) had severe stress disorder. 5 (26.3%) of males had severe stress disorder, while 14 (73.7%) of females had a severe stress disorder in the second question of LBP. 25 (80.6%) females had a severe disorder, while 6 (19.4%) males in the third question of LBP. 14 (28%) of males had severe stress, while 36 (72%) females had severe stress in the fourth question of LBP, as shown in figure 3.

Association between K10 scale of stress and LPB

The mean score of stress was (23.68 ± 8.2) suggest to having mild disorder among medical students. There was a significant association between stress and LBP ($p = 0.001$) in all questions about lower back pain except the first question, as expressed in Table 2. Furthermore, there was a negative correlation between stress and LBP in the 1st question $r = -0.093$, 2nd question $r = -0.125$, 3rd question $r = -0.178$, 4th question $r = -0.231$, negative correlation means the increase in stress will reduce LPB and vice versa.

Association between K10 scale and other variables

There was a significant association between stress and GPA ($p = 0.04$). Also, there was a positive correlation $r = 0.08$, which means when the stress increase, GPA increases vice versa. Moreover, there was a significant relation between smoking and stress with ($p =$

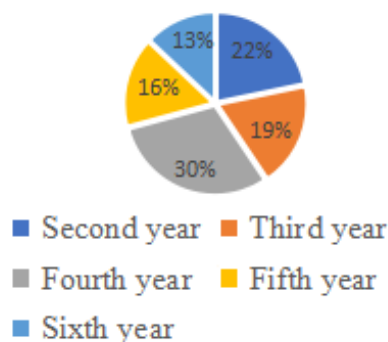


Figure 4 12-months prevalence of LBP in academic year.

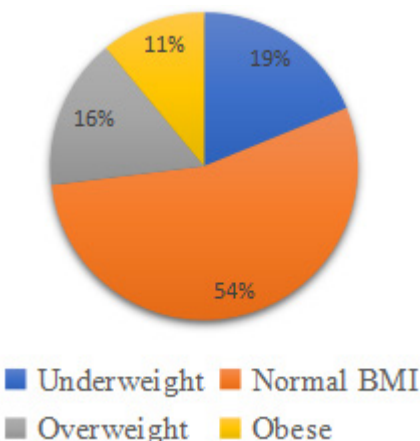


Figure 5 BMI 12-months prevalence of LPB.

0.006) and negative correlation with smoking $r = -0.071$. Otherwise, there's was a significant association between stress and BMI with ($p = 0.023$) and negative correlation $r = -0.01$. As well, there was a significant association with sports ($p = 0.036$), and $r = 0.132$ means a positive correlation.

DISCUSSION

This study aimed to measure the prevalence of low back pain and its relation to stress among medical students in Saudi Arabia. According to our results analyses, two-thirds of respondents were females 313(69.2%), while 139(30.8%) were males. The data revealed 308 (68.1%) of students had experienced lower back pain in the last 12 months. This finding is similar to a study carried out in Belgrade (Serbia), which shows that 75.8% of medical students reported LBP at some point in their lives, 59.5% in the last 12 months^[10]. A study conducted in Umm Al-Qura University, was familiar to our result, which reported that (69.4%) of medical students had LBP (18). In the present study, we found a higher prevalence of LBP among females, which was ($n = 231$; 75%), compared to males ($n = 77$; 25%). This finding supported by a study carried out in Belgrade (Serbia) shows the prevalence of LBP was significantly higher among females than males^[10]. Consequently, LBP had many associated factors that may be present with it, as our result showed a significant association between LBP and stress. We found the relationship between stress and LBP among females was higher than males; it was 60 (75.9%) females while males 19 (24.1%). Another study at *General Hospital Psychiatry shows lower back pain with higher severity of stress sensitivity*^[19]. Our research shows that 80 (17.7%) of students daily do sport activities, while 246 (54.4%) sometimes do workout, and 126 (27.9%) never practice exercise. A recent study conducted in France found that 420 (33.8%) students frequently practice sport, whereas 653 (52.5%) reported occasional practice sports, and 170 (13.7%) of students never practiced sport^[20]. Furthermore, there was no significant association between sport and LBP in the 1st and 3rd questions of LBP. Otherwise, LBP's 2nd and 4th questions had a significant association between sport and LBP, which means some of the students participants who do sports activities suffer from back pain. In contrast, others do not suffer from low back pain because of doing sports regularly. A study conducted in Sweden showed that increased exercise time more than 6 hours per week would make them vulnerable to lower back pain^[21]. Besides, we found that (31.6%) of students preferred walking, which was the most common sport. Another study shows that walking at least 30 minutes per day is significantly associated with a decrease in LBP occurrence^[20]. Our result indicates a positive association between LBP and BMI ($r = 0.125$); therefore, the participants with normal BMI ($n = 167$; 54.2%) have a higher LBP rate. A recent study carried out in Washington State Twin Registry, which supports our findings show that there were significant associations between LBP and BMI. Additionally, they found that with every one-unit increase in BMI, this will increase the chance of having LBP 4-fold^[22].

We found that asthma is the most common chronic disease; the total number of students was 27 (6%) who had asthma and complained of LBP. According to a previous study in Sweden, find those who have asthma had a higher risk of experiencing LBP^[23]. Also, our result shows there was no significant association between smoking and LBP. In contrast to a study conducted in America showed that there was a significant association between LBP and smoking^[24]. There was a significant relationship between stress and low back pain in our study among medical students (P -value = 0.001). A study conducted at King Saud University supports our result, where they found the relationship between stress and low back pain ($p < 0.001$)^[25].

Limitations of the study

All university participants in our research were from the second year

to the sixth year, except for the Fakeeh collage of medical students; it stands for the fourth year. Additionally, Jeddah College of Medicine's female's department stands to the third year. Also, there were a small number of males participating in our study, and these few numbers are the reason for more biased towards women.

CONCLUSION

In conclusion, the prevalence of LBP is high among medical students and significantly affects their daily mood and functioning. Female students have substantially higher LBP and stress compared to males. Anxiety and depression are associated with disability caused by LBP among medical students. LBP reduces physical, social, and academic performance. We recommend that students take a break while studying and do stretching or walking exercises to change from the sitting position. Finally, more detailed studies should be conducted on the relationship between stress and LBP among medical students in Saudi Arabia.

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