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PREVALENCE AND RISK FACTORS OF LOW BACK PAIN AMONG MEDICAL STUDENTS AT UNIVERSITY OF TABUK, KINGDOM OF SAUDI ARABIA

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ABSTRACT

Objectives: Low back pain (LBP) is a common health problem worldwide that affects all ages. Medical schools tend to have lengthy curricula, enhanced use of computers in learning, and a sedentary lifestyle. All these issues raise the risk of LBP in medical students. This study aimed to assess the prevalence and risk factors of LBP among medical students at the University of Tabuk, Saudi Arabia.

Methods: This cross-sectional study was conducted in the Faculty of Medicine, University of Tabuk, Tabuk, Saudi Arabia. Male and female medical students from all academic year levels were included in the study. A self-administered online questionnaire was used for data collection.

Results: The prevalence of low back pain among all participants was 62.6%. The significant risk factors for the disease were; being female students (OR = 2.54, CI = 1.42-4.54), overweight and obese students (OR = 3.42, CI = 1.58-7.39) (OR= 25.02, CI = 9.76-64.06), physically inactive (OR = 2.74, CI =1.26-5.98), sitting in unhealthy positions during studying (OR = 2.64, CI = 1.22-5.71) and suffering from stress either always or sometimes (OR = 3.14, CI = 1.59-6.20) and (OR = 3.07, CI = 1.38-6.79), respectively.

Conclusions: The present study revealed an alarmingly high prevalence of LBP among medical students at the University of Tabuk, Saudi Arabia. The significant risk factors for LBP are being female, obesity, sitting in an unhealthy position, physical inactivity, and stress. Medical colleges should pay attention to increasing students' awareness of this problem and implement an intervention program to enhance the students' musculoskeletal health.

Keywords: low back pain, medical students, prevalence, risk factors, Tabuk, Saudi Arabia

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INTRODUCTION

Low back pain (LBP) is one of the most common health issues worldwide and affects people of all ages. It is a frequent source of medical consultations and a significant cause of disability, with a tremendous financial impact on many countries' healthcare systems (1). Epidemiological studies have indicated increased LBP in children, adolescents, and young adults; however, the prevalence rates across studies are highly variable (2-4). Many risk factors for LBP have been reported. These included age, sex, obesity, psychosocial factors (stress, anxiety, and depression), level of education, occupational factors, decreased flexibility and mobility of muscles, hypermobility, competitive sports, postural habits, level of physical activity, smoking, and domestic factors such as watching TV and computer/videogames (5,6).

The goals of a medical school are to create qualified, reputable physicians for society's health care. However, medical schools tend to have lengthy curricula, enhanced use of computers in learning, and a sedentary lifestyle. In addition, the students are subjected to stress and long training hours in hospitals. All these issues raise the risk of LBP in medical students, which could negatively impact their productivity, quality of life, and potential future professions (7,8).

Many of the aforementioned risk factors are modifiable, and promoting awareness among students regarding exercise, weight management, and mental health might be beneficial. To the best of our knowledge, this study is the first to assess the prevalence of low back pain among medical students at the University of Tabuk. This study aimed to assess the prevalence and risk factors of LBP among medical students at the University of Tabuk, Saudi Arabia.

MATERIAL AND METHODS

Ethical considerations:

This study obtained approval from the Local Research Ethics Committee (LREC) at the University of Tabuk, Tabuk, Saudi Arabia, under the number (UT-232-105-2023). The survey obtained all participants' informed consent by including a consent statement. The purpose of the study and the questionnaire's contents were described to the students, and they were also informed that their anonymized data would only be used for research and that their confidentiality would be maintained.

Study design, setting, and timing:

This cross-sectional study was conducted in the Faculty of Medicine, University of Tabuk, Tabuk, Saudi Arabia, in February 2023 to investigate LBP among medical students.

Study participants, sample size, and sampling technique:

Male and female medical students from all academic year levels at the Faculty of

Medicine, University of Tabuk, were included in the study. The sample size was calculated using the Open Epi statistical calculator depending on the following data: The total number of students in the Faculty of Medicine at the University of Tabuk equals 800, a prevalence rate of LBP among medical students of 68% according to a previous study (9), with a 95% confidence interval (CI) at a 5% marginal error rate. The total required sample size was 237. The students were recruited using the simple random sampling technique, and they were categorized into preclinical years (including 1st, 2nd, and 3rd years) and clinical years (including 4th, 5th, 6th, and internship).

Data collection tool:

The data were gathered using the online Google Form application. The first page of the form explained the study's purpose to the participants and asked for their consent to participate in the study.

A self-administered online questionnaire was used for data collection. The items of the questionnaire were generated by the authors in guidance on scientific literature items (9). It contains 15 questions, including demographic characteristics (sex, age, weight, height, and academic year), the presence of LBP, firstly starting to ask about the duration of suffering from LBP, the severity of LBP, and the impact of pain on daily functioning (sleeping, walking, standing, and everyday activities, lifting heavy things). There are other questions that screened the psychosocial and physical factors associated with LBP, such as practicing physical exercise, a healthy nutritional diet, and proper body posture during studying. The items of the questionnaire were revised by experts and the content validity ratio was 0.84.

Statistics:

The data analyses were performed using the Statistical Packages for Social Sciences (SPSS, IBM Corp, Armonk, USA) version 22. Descriptive statistics were presented

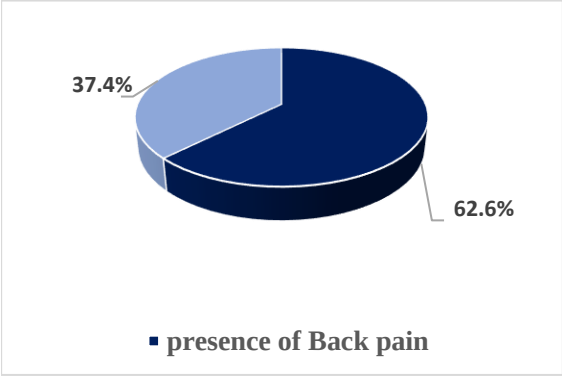
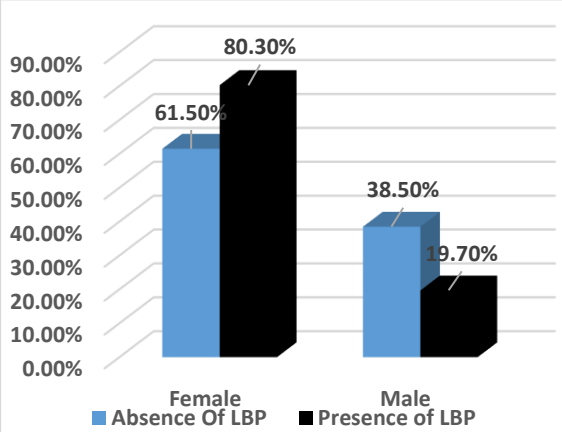
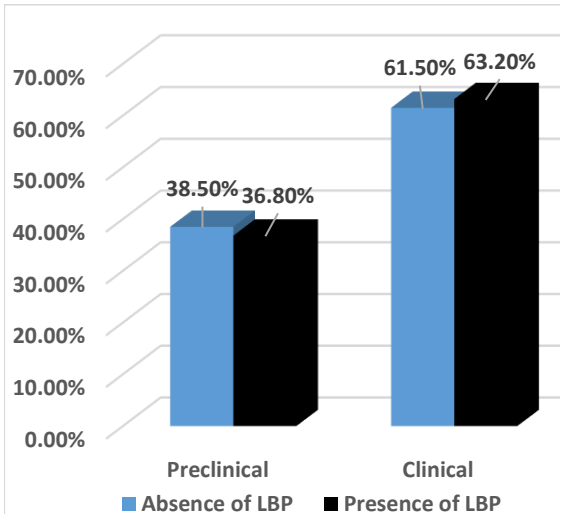


Figure. 1: Prevalence of back pain among medical students, University of Tabuk



Chi square test was computed,P<0.05 is significant. P value: 0.002.

Figure 2: Prevalence of LBP according to gender among medical students, University of Tabuk.



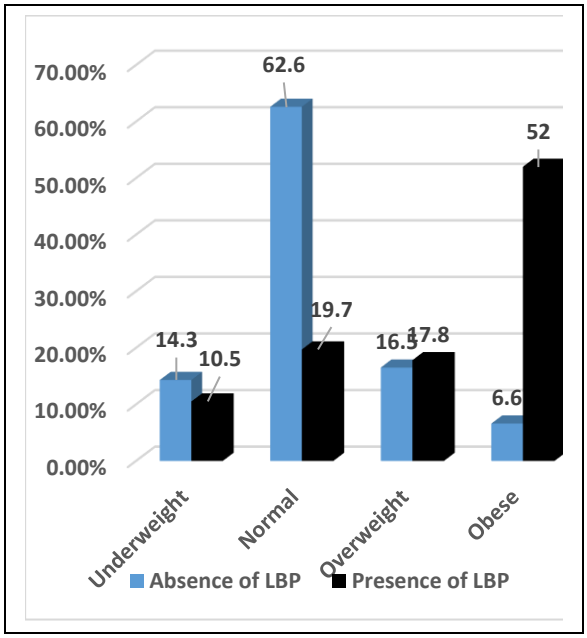
Chi square test was computed.P value: 0.801

Figure 3: Prevalence of LBP according to academic year among medical students, University of Tabuk.

using numbers and proportions (%). Body mass index (BMI) was calculated by dividing weight in kg by square height in meters, and the weight categories were aligned according to the following cutoff points (underweight if less than 18.5, normal weight if between 18.5 to <25, overweight if between 25 to <30, and obese if 30 or more). The prevalence of LBP was assessed in relation to gender, BMI, and academic year levels by using the Chi-Square test. Factors that determine the occurrence of LBP were also investigated, and Odds Ratio (OR) and Confidence Interval (CI) were calculated. A p-value less than 0.05 was used to determine statistical significance.

RESULTS

Figure. 1 demonstrates that the prevalence of low back pain among the participating students at the University of Tabuk was



Chi square test was computed. $p < 0.05$ is significant. P value: 0.000*.

Figure 4: Prevalence of LBP according to BMI categories among medical students, University of Tabuk.

62.6%. The prevalence of LBP was significantly higher in females than males (80.3% vs 19.7% respectively) (p = 0.002) (Figure. 2). Figure 3 illustrates that the prevalence of LBP according to academic year category was higher among the clinical year students (63.2%) than the preclinical year students (36.8%); however, this difference was not statistically significant (p=0.801). The prevalence of LBP was significantly highest among obese students (52.0%) and lowest among underweight students (10.5%) (p = 0.000) (Figure. 4).

Table 1 shows the characteristics of low back pain among medical students who were suffering from it; the highest percentage (53.9%) of them reported a duration from 1

month to less than 6 months. The severity of LBP among the participants varied between minimal (52.0%), severe (31.6%), and moderate (16.4%). The majority of the participants reported that the effect of LBP on their daily activity ranged from minimal effect (53.3%) to no effect (34.2%). Most of them stated that LBP may sometimes increase when lifting heavy objects (53.3%). They frequently reported no effects of pain on their daily walking (44.1%), sitting (40.7%), and sleeping (65.1%), while the majority mentioned that LBP sometimes affects standing (48.0%) and riding cars, trains, and planes (50.0%).

Table 2 demonstrates the risk factors for LBP among the students, as from the general characters; the female students were significantly 2 times more at risk than male students for occurrence of the disease (OR = 2.54, CI = 1.42-4.54), the overweight students were significantly 3 times more at risk than normal weight students (OR= 3.42, CI = 1.58-7.39), and the obese students were significantly 25 times more at risk than normal weight students for occurrence of LBP (OR = 25.02, CI = 9.76-64.06).

For the related lifestyle factors, the students who never or irregularly practiced physical exercise were significantly 2 times at higher risk for development of LBP (OR = 2.74, CI = 1.26-5.98) and (OR = 2.37, CI = 1.03-5.45) respectively. Those who didn't sit in a healthy, proper position during studying were significantly 2 times more at risk of developing LBP than those who sat in a healthy position (OR = 2.64, CI = 1.22-5.71). Lastly, suffering from stress either always or

Variables	Category	N (152)	100%
Beginning of LBP	< 1 month	24	15.8
	1- <6 months	82	53.9
	6-12months	19	12.5
	>12 months	27	17.8
Severity of LBP	Minimal	79	52.0
	Moderate	25	16.4
	Severe	48	31.6
Effect of LBP on daily activities	No effect	52	34.2
	Affects minimally	81	53.3
	Affects moderately	19	12.5
	Prevents it	0	0.0
Increasing LBP with heavy lifting	No	44	19.0
	Yes	27	17.7
	Sometimes	81	53.3
Effect of LBP on daily walking	No	67	44.1
	Affects slightly	58	38.1
	Affects moderately	26	17.1
	Prevents it	1	0.7
Effect of LBP on sitting	No	62	40.7
	Affects slightly	58	38.2
	Affects moderately	32	21.1
	Prevents it	0	0.0
Effect of LBP on standing	No	66	43.4
	Sometimes	73	48.0
	Yes	13	8.6
Effect of LBP on Sleeping	No	99	65.1
	Sometimes	45	29.6
	Yes	8	5.3
Increasing LBP by riding cars, trains or plans.	No	72	47.4
	Sometimes	76	50.0
	Yes	4	2.6

Table 1. Characters of low back pain among medical students suffering from it.

infrequently significantly increases the risk of developing LBP 3 times more than without stress (OR = 3.14, CI = 1.59-6.20) and (OR = 3.07, CI =1.38-6.79) respectively.

DISCUSSION

Low back pain (LBP) is a common reason for medical consultations, and it is an important cause of disability and has a tremendous financial impact on many countries' healthcare systems (1). The goals of a medical school are to create qualified, reputable doctors for the health care of society. However, medical schools tend to have lengthy curricula, enhanced use of computers in learning, and a sedentary lifestyle. In addition, the students are subjected to stress and long training hours in

Variable	Category	LBP		P value	OR(95%CI)
		Absent (n=91) No. (%)	Present (n=152) No (%)		
General Characters					
Gender	Female	56 (61.5)	122 (80.3)	0.002*	2.54 (1.42- 4.54)
	Male	35 (38.5)	30 (19.7)	------	1
Academic year	Pre-clinical years	35 (38.5)	56 (36.8)	------	1
	Clinical years	56 (61.5)	96 (63.2)	0.801	1.07(0.62- 1.83)
BMI	Underweight	13 (14.3)	16 (10.5)	0.055	2.33(0.99-5.49)
	Normal	57 (62.6%)	30 (19.7%)	----	1
	Overweight	15 (16.5%)	27 (17.8%)	0.001*	3.42 (1.58- 7.39)
	Obese	6 (6.6%)	79 (52.0)	0.000*	25.02(9.76- 64.06)
Lifestyle factors					
Practice sport exercises regularly	No	44 (48.4)	89 (58.6)	0.009*	2.74(1.26- 5.98)
	Sometimes	28 (30.8)	49 (32.2)	0.039*	2.37(1.03-5.45)
	Yes	19 (20.9)	14 (9.2)	----	1
Follow a healthy nutrition diet	No	48 (52.7)	91 (59.9)	0.328	1.47(0.67- 3.22)
	Sometimes	29 (31.9)	43 (28.3)	0.740	1.15(0.49- 2.67)
	Yes	14 (15.4)	18 (11.8)	-----	1
Sit in a healthy position to study	No	35 (38.5)	74 (48.7)	0.011*	2.64 (1.22- 5.71)
	Sometimes	39 (39.6)	62 (40.8)	0.077	1.98(0.92- 4.29)
	Yes	20 (22.0)	16 (10.5)	-----	1
Sit for a long time	No	11 (12.1)	12 (7.9)	-----	1
	Sometimes	22 (24.2)	15 (9.9)	0.378	0.62(0.21- 1.78)
	Yes	58 (63.7)	125 (82.2)	0.122	1.97 (0.82- 4.74)
Suffer from stress	No	28 (30.8)	22 (14.5)	----	1
	Sometimes	17 (29.7)	41 (27.0)	0.005*	3.07(1.38- 6.79)
	Yes	36 (39.6)	89 (58.6)	0.000*	3.14(1.59- 6.20)

Table2. Risk factors of low back pain (LBP) among medical students, University of Tabuk.

hospitals. All these issues raise the risk of LBP in medical students, which could negatively impact their productivity, quality of life, and potential future professions (7,8).

Many of the aforementioned risk factors are modifiable, and promoting awareness among students regarding exercise, weight management, and mental health might be beneficial. Therefore, this study aimed to assess the prevalence and risk factors of LBP among medical students at the University of Tabuk, Saudi Arabia.

The present study revealed an alarmingly high prevalence of LBP (62.6%) among medical students at the University of Tabuk, Saudi Arabia. This is nearly similar to another study conducted in Saudi Arabia that reported a 52.5% prevalence of LBP among medical students at Jazan University (7), and another one that shows a 40.5% prevalence of LBP among medical students at University Hospitals in Riyadh (10). This prevalence is not far from the total prevalence of back pain among the Saudi population in a study conducted by Almutairi et al. (11). who found a high prevalence (63.8%) of LBP among 2,717 subjects aged 18 to 60.

The reported prevalence of LBP among medical students in Saudi Arabia is much higher than in other countries. The reported prevalence of LBP among Serbian medical students was 20.8% (12), and among Chinese medical and dental students was 30.6% (13). A study performed among Harvard medical students in the United States showed an overall prevalence of LBP of 7% (14). LBP was also less common among medical students in Brazil, with a point prevalence of 9.2% (15). Even though a study in France recruited 1800 medical students from the 2nd to 6th years, it explored a 72.1% prevalence of LBP (16).

The observed variations in the LBP prevalence between studies in Saudi Arabia and other countries might be explained by differences in lifestyle, diet, and culture, as well as academic curricula, which probably make the Saudi population more susceptible to LBP, as suggested by Almutairi et al. (11).

The prevalence of LBP was significantly higher among females (80.3%) than males (19.7%), and the females were 2 times at higher risk of back pain. The sex disparities in pain are attributed to interactions between biological, psychological, and sociocultural factors, and it can also be partially explained by the increased pain sensitivity in women (17); also, different ratios of muscle and adipose tissue in females and males could also explain our finding (18). A similar finding has been reported among medical students in Bangladesh (19). However, a study in Sudan detected a 69.3% prevalence of back pain among medical students, with a statistically insignificant difference between male and female students (20).

Furthermore, obese students showed a significantly higher prevalence of LBP (52.0%), and overweight and obese are at higher risk of developing the disease compared to normal-weight students. A high BMI was considered a risk factor for LBP by Boszczowski et al. (21), and Sany et al. (19). They attributed the increased prevalence of

LBP with increased body weight to the induced higher pressure on the intervertebral disc and other spine structures. Although our results demonstrate that the prevalence of LBP tends to increase among senior-year students in the clinical years more than junior-year students in the preclinical years, the academic year category was not regarded as a significant risk factor for LBP in the present study. This is consistent with the results of the study conducted by Dighriri et al. (7), while other studies showed that LBP significantly increases as the year of education increases and that complaints were more common among students in higher grades (9,10,22). It seems that the senior-year students' altered study habits when they started their clinical practice, internship, and hospital rounds may affect the development of LBP. However, further research is needed to confirm this link.

Our results demonstrate that sitting in an unhealthy and improper position was a significant risk factor for LBP. It has been reported that prolonged sitting in an incorrect position increases spinal compression load and dysfunction of paraspinal muscles (23). Our finding coincides with studies conducted by Ilic et al. (12) and Holm et al. (24).

Our study, at the same time, found that sitting time wasn't considered a risk factor for LBP; this could be explained as Almutairi et al. (11) stated that individuals have a great variation in the relation between the amount of time spent sitting and relaxing and the physical demands placed on muscles.

The results of this study reported a significant increase in the risk of LBP among those who never or irregularly practiced physical exercise; this is in line with the results of meta-analysis studies that concluded that a medium level of physical activity is associated with a decreasing prevalence of LBP (25) and a sedentary lifestyle is considered a risk factor for the development of LBP among adults (OR=1.24, 1.02-1.5) (26). This could be attributed to weakness in the paraspinal muscles and increased fat content due to physical inactivity that is associated with the development of LBP (26).

Our study indicates that stress is significantly linked to an increased risk of LBP. This result is documented by many studies. Psychosocial factors, such as stress, anxiety, and depression, have been suggested to be associated with LBP (27,28).

The effects of LBP on daily life activities, including walking, sitting, standing, sleeping, lifting heavy objects, and riding cars, trains, or planes, were variable but mostly not severe. Across research, there appears to be agreement that LBP is linked to problems of daily life activities, with a strong influence on working capacity and loss of productivity (29).

Limitations

This study has some limitations. The use of a self-reported questionnaire may lead to recall and self-reporting bias and a propensity to report socially required responses. Objective data based on imaging investigations should also be obtained to evaluate the LBP, rather than depending on the subjective feelings of

the participants, which can be considered to further assess the presence and severity of the condition. Also, the representation of more female participants in the included sample may not give a proper distribution of physical and social factors that are differentially distributed by gender.

CONCLUSION

The present study revealed an alarmingly high prevalence of LBP among medical students at the University of Tabuk, Saudi Arabia. The significant risk factors for LBP are being female, obesity, sitting in an unhealthy position, physical inactivity, and stress. Medical colleges should pay attention to increasing students' awareness of this problem. Authorities at medical schools or hospitals should implement an intervention program to enhance the students' musculoskeletal health and, in turn, their quality of life.

Acknowledgment

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Conflict Of Interest:

All authors declare no conflict of interest.

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