

Prevalence and determinants of low back pain among residents in Abha City, Saudi Arabia

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ABSTRACT

Background: Healthcare work is a major risk for having musculoskeletal disorders (MSDs), including low back pain (LBP). This study aimed to estimate the prevalence of LBP and define its associated risk factors among resident physicians. **Material and Methods:** A descriptive cross-sectional survey was conducted among all resident physicians of all specialties in Abha city during the period from July 2020 to September 2020. Data were collected using an online pre-structured data collection tool. The Nordic Musculoskeletal Questionnaire (NMQ) (back pain section) was applied to assess the effect of LBP on the residents' ability to perform job duties effectively. **Results:** A total of 312 resident physicians responded. Their age ranged between 25 and 41 years. Males represented 57.7% of them. The prevalence of LBP was 64.7%. The most common reported aggravating factors for LBP were working in uncomfortable posture (73.3%), standing for long periods (64.4%), and long sitting sessions (51.5%). Regarding the pain-relieving factors, sleeping ranked first (60.4%), followed by taking analgesics (48.5%) and maintaining a good posture (35.6%). Multivariate logistic regression analysis revealed that obese subjects were at higher risk than underweight subjects to develop LBP (adjusted odds ratio (AOR) = 6.18, 95% confidence interval (CI): 1.26–30.34, $P = 0.025$). Compared to resident physicians without family history of back pain, those with such history were at almost 4-fold higher risk of developing LBP (AOR = 3.90, 95% CI: 2.33–6.52, $P < 0.001$). **Conclusion:** LBP is a very prevalent problem among resident physicians, particularly obese subjects and those with family history of back pain. LBP adversely impacts the work performance of the affected physicians.

Keywords: Associated factors, low back pain, physicians, prevalence, Saudi Arabia

Introduction

Low back pain (LBP) is a worldwide problem that affects 70%–80% of the population and influences their social and economic status.^[1,2]

The majority of cases of LBP are for non-specific causes.^[3] It is self-limiting and mostly treated within primary care after 12 months of primary diagnosis of LBP; three-quarters of patients might have persistent symptoms such as pain and disability.^[1]

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Obesity, smoking, pregnancy, stress, poor physical environment, poor posture, and poor sleeping position may predispose to LBP.^[4-6] There is a larger list of possible predisposing factors that includes infrequent rare conditions.^[7] Physical causes may

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include osteoarthritis, intervertebral degeneration of the discs or a spinal disc herniation, broken vertebrae, and rarely, an infection or tumor of the spine.^[8]

The difficult working conditions for healthcare staff are a major risk for having musculoskeletal disorders (MSDs), including LBP.^[9] Prolonged standing and sitting, poor posture, heavy lifting, pushing or pulling of objects, bending and twisting, and heavy physical work are the major risk factors for LBP among the healthcare staff. These factors differ according to the resident specialty.^[10] The annual prevalence of LBP among medical staff is nearly 77%.^[11]

Work-related complaints are a major concern facing residents and employers worldwide. It varies according to the resident specialty. LBP is a common problem that many residents suffer from.^[12,13] This study was done to study the burden of this problem in different aspects, such as psychological and social aspects, in addition to its effect on residents' work-related capacity and quality of care.

Material and Methods

Study design, time and setting

A descriptive cross-sectional study was conducted during the period from February to May 2022 at all governmental hospitals with programs for residents in Abha city, Southern Saudi Arabia. This included Aseer Central Hospital (ACH), Abha Maternity and Children Hospital, and Abha Psychiatric Hospital.

Study population

This study targeted all residents at all specialties in the aforementioned Abha hospitals with residency programs.

Inclusion criteria

- Saudi nationality;
- Residency for at least 6 months;
- Free of chronic health problems;
- Agreed to participate in the survey.

Exclusive criteria

- Non-Saudi;
- Refused to participate in the survey;
- Residents with chronic MSD or psychological disorders.

Sample size and sampling technique

A cross-sectional design including all accessible residents who met the inclusion criteria and agreed to participate in the study was done. After having the ethical approval, all accessible residents within Abha city who met the eligibility criteria were invited to participate in the survey. A total of 364 resident physicians were included based on the list of available residents within each specialty.

Data collection procedure

After obtaining permission from the institutional ethics committee, data collection was started. Data were collected from

participants by using an online pre-structured data collection tool. The tool was sent through social media platforms, and all accessible residents in the study setting were invited to fill out the attached tool. The researchers constructed the survey tool after an intensive literature review and expert consultation. The tool covered the following data:

- Residents' sociodemographic data such as age, gender, marital status, residence, and monthly income;
- Residents weight, height, and body mass index (BMI);
- Smoking and other related habits;
- Physical activity and sports practices;
- Residency data, including specialty, duration, and level of residency;
- Work-related data, including the number of weekly working days, shifts, workload during the shift, and work-related environment (setting duration, standing duration, bending, and lifting heavy objects);
- LBP was assessed using the specific question of the Nordic Musculoskeletal Questionnaire (NMQ);^[14]
- Days of absenteeism and the effect of LBP on the residents' ability to perform job duties effectively.

Operational definition

LBP is pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without sciatica, and is defined as chronic when it persists for 12 weeks or more. Nonspecific LBP is pain not attributed to a recognizable pathology (e.g. infection, tumor, osteoporosis, rheumatoid arthritis, fracture, and inflammation).^[15]

Data analysis

Data were filtered and then fed to Statistical Package for Social Sciences (SPSS) software (ver. 27) for statistical analysis. Baseline data were tabulated and analyzed by descriptive statistics as continuous variables and described as mean and standard deviation, whereas categorical variables were described as frequency and percentage. Chi-square test was applied to investigate the association between two categorical variables, whereas Student's *t* test was adopted to compare the means of a continuous variable between two different groups. Multivariate logistic regression analysis was applied to control for the confounding effect. Its results were expressed as adjusted odds ratio (AOR) and their 95% confidence interval (CI), and significance level (*P* value) was set at ≤ 0.05 .

Ethical considerations

Ethical approval for this study was obtained from Ethics Review Committee of the College of Medicine, King Khalid University.

Results

Response rate

A total of 312 resident physicians responded by returning a filled questionnaire, out of a targeted 364, giving a response rate of 85.7%.

Sociodemographic characteristics

Table 1 summarizes the sociodemographic characteristics of the participants. Their age ranged between 25 and 41 years, with an arithmetic mean of 29.8 years and a standard deviation (SD) of 3 years. Males represented 57.7% of them, and 57.7% of the participants were married. Most of them (75%) live within the medical residency region. Prevalence of current smoking was 22.4%.

Most of them were either overweight (40.8%) or obese (21.1%), as displayed from Figure 1.

Medical and family history

Family history of back pain and MSDs were reported by 53.8% and 19.2% of the participants, respectively. History of chronic health problems was observed among 12.2% of the respondents [Table 2].

Residency program-related characteristics

As evident from Table 3, internal medicine, family medicine, and pediatrics residents represented 16%, 15.1%, and 10.6% of the participants, respectively. Almost two-thirds of the participants (68%) work on average for 8 hours daily, and most of them (81.4%) work for 5 days or less per week on average. Regarding the average number of patients seen, 42.9% of the participants see 15 patients or less per day.

Prevalence of low back pain

From Figure 2, it is evident that the prevalence of LBP among EPs was 64.7%.

Characteristics of the low back pain

Table 4 summarizes different characteristics of LBP among EPs. Trauma was responsible for 9.9% of cases. Slightly more than half of the cases (51%) were observed during the residency program. Dull pain was the most commonly reported (56.4%), followed by sharp pain (14.9%) and cramps (11.9%). LBP lasted for more than 3 months among 64.9% of the residents, and its frequency was 2–3 days per week among 41.1% of the respondents.

The most commonly reported aggravating factors for LBP were working in uncomfortable posture (73.3%), standing for long periods (64.4%), and long sitting sessions (51.5%) [Figure 3].

Regarding the pain-relieving factors, sleeping ranked first (60.4%), followed by taking analgesics (48.5%) and maintaining a good posture (35.6%) [Figure 4].

Factors associated with low back pain

Among the studied sociodemographic factors, the only one significantly associated with LBP among resident physicians was the body mass index as the highest rate of LBO was observed among obese subjects (79.7%), whereas the lowest rate was observed among underweight subjects (50%) ($P = 0.028$). Resident

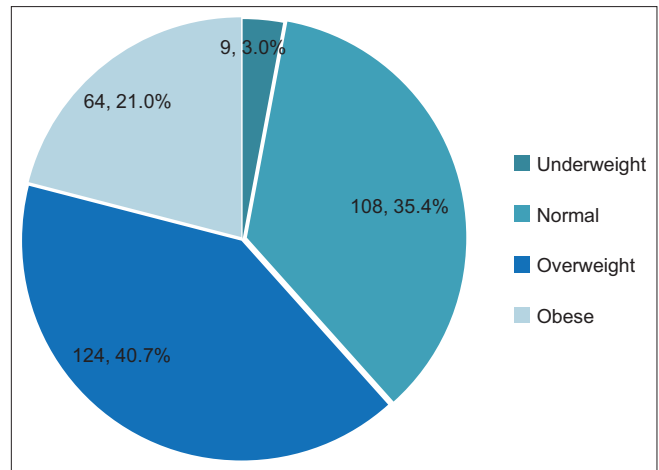


Figure 1: Body mass index of the participants (n = 305)

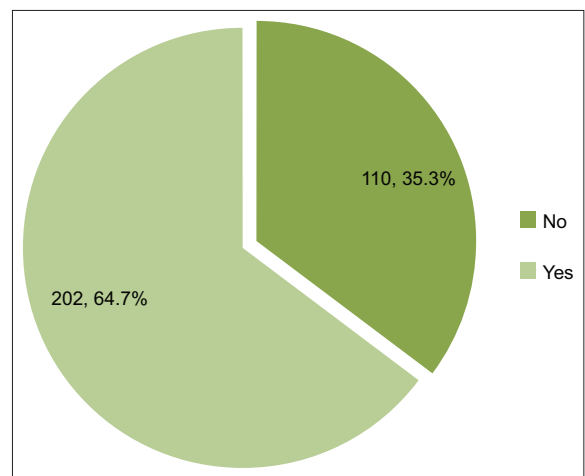


Figure 2: Overall prevalence of low back pain among emergency physicians in Abha, Saudi Arabia

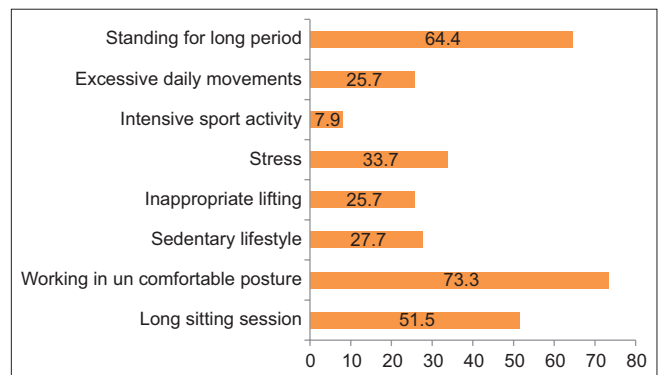


Figure 3: Pain aggravating factors among residents with low back pain (n = 202)

physicians with family history of back pain were more likely to develop LBP compared to those without such history (78% vs. 49.3%; $P < 0.001$). In addition, resident physicians with history of chronic health problems were more likely to develop LBP compared to those without such history (81.6% vs. 62.4%; $P = 0.020$). Resident physicians working over 5 days/week on

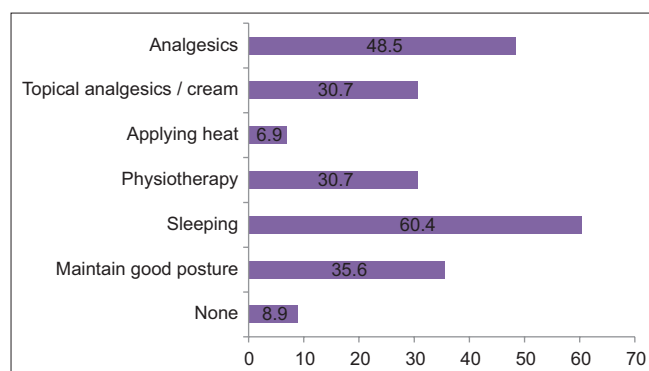
Table 1: Sociodemographic characteristics of the participants (n=312)

Variables	Frequency	Percentage
Gender		
Male	180	57.7
Female	132	42.3
Age in years		
Range	25–41	
Mean±SD	29.8±3.0	
Marital status		
Single	128	41.0
Married	180	57.7
Divorced/widowed	4	1.3
Place of residence		
Within the medical residency region	234	75.0
Outside the medical residency region	78	25.0
Smoking status		
Non-smoker	216	69.3
Current smoker	70	22.4
Ex-smoker	26	8.3

SD: Standard deviation

Table 2: Medical and family history of the participants

Variables	Frequency	Percentage
Family history of back pain		
No	144	46.2
Yes	168	53.8
Family history of musculoskeletal disorders		
No	252	80.8
Yes	60	19.2
History of chronic health problems		
No	274	87.8
Yes	38	12.2

**Figure 4: Pain-relieving factors among residents with low back pain (n = 202)**

average were more likely to have LBP compared to those working 5 days or less per week (77.6% vs. 61.8%; $P = 0.023$) [Table 5].

Multivariate logistic regression analysis

Multivariate logistic regression analysis revealed that obese subjects were at a higher risk of developing LBP than

underweight subjects (adjusted odds ratio (AOR) = 6.18; 95% confidence interval (CI): 1.26–30.34, $P = 0.025$). Compared to resident physicians without family history of back pain, those with such history were at almost 4-fold higher risk of developing LBP (AOR = 3.90, 95% CI: 2.33–6.52, $P < 0.001$). Average working days/week and history of chronic health problems were not significantly associated with LBP among the participants [Table 6].

Effect of LBP

Table 7 shows that 16.8% of resident physicians had absenteeism days due to LBP; it was 1–4 days per month among 14.4% of them. Slightly less than half of physicians with LBP (49%) had decrease quality in work performance, mostly experienced sometimes (46%).

Discussion

Prevalence of LBP

The prevalence of LBP among resident physicians in the current study was high (64.7%), based on the NMQ.^[14] In addition, a slightly higher figure has been documented in the eastern region of Saudi Arabia as the prevalence of lifetime LBP has been reported as 67.7%.^[16] Even higher rates have been reported in other Saudi studies carried out in Tabuk,^[17] southern region,^[18] and Riyadh,^[19] where the lifetime prevalence of LBP has been reported as 76.4%, 73.9%, and 87.7%, respectively. Internationally, relatively lower rates have been reported. In Turkey, among medical residents of various specialties, the prevalence of LBP has been reported to be 56.8%^[20] and among physicians, it is 53.9%.^[21] In Iran, a prevalence rate of 15.1% was observed among physicians.^[9] However, a low prevalence rate has been reported in Kuwait among physicians (13.7%).^[22] In India^[23] and Malaysia,^[24] rates of 36.8% and 56.9%, respectively, have been reported among physicians. The variation in the rates reported in the aforementioned studies could be explained by differences in demographic and work-related characteristics of the participating physicians in these studies as well as the use of different tools to diagnose LBP.

Factors associated with LBP

In the present study, multivariate logistic regression analysis revealed that obese resident physicians and those with family history of back pain were at significantly higher risk for developing LBP than their counterparts. Other investigators^[25,26] reported a significant role of obesity in inducing LBP among healthcare workers. However, the exact mechanism is not well defined till now.

In the present study and in agreement with others,^[17,20,22,24] there was no gender difference between physicians regarding the prevalence of LBP. However, some others^[16,21,23,27,28] reported that LBP was more prevalent among females as a result of the physiological, structural, and anatomical differences between males and females and the fact that mechanical disadvantage and strain are more frequently reported in females.^[29]

Table 3: Residency program-related characteristics of the participants

Variables	Frequency	Percentage
Residency level		
R1	76	24.4
R2	78	24.9
R3	72	23.1
R4	66	21.2
R5	20	6.4
Specialty		
Family medicine	47	15.1
Preventive medicine	19	6.1
Internal medicine	50	16.0
General surgery	25	8.0
Obstetrics/Gynecology	27	8.7
Pediatrics	33	10.6
Radiology	27	8.7
Emergency medicine	21	6.7
Psychiatry	11	3.5
Otolaryngology	11	3.5
Surgery sub-specialty	18	5.8
Others	23	7.4
Average daily working hours		
<8	56	17.9
8	212	68.0
>8	44	14.1
Average working days/week		
≤5	254	81.4
>5	58	18.6
Average number of patients cared per day		
None	30	9.6
≤15	134	42.9
16–30	100	32.1
>30	48	15.4

SD: Standard deviation

Table 4: Characteristics of low back pain among resident physicians in Abha, Saudi Arabia (n=202)

Variables	Frequency	Percentage
Pain related to trauma		
No	182	90.1
Yes	20	9.9
Onset of pain		
Before residency program	99	49.0
During residency program	103	51.0
Type of pain		
Burning	4	2.0
Cramps	24	11.9
Crushing	15	7.4
Dull	114	56.4
Sharp	30	14.9
Stabbing	7	3.5
Throbbing	8	4.0
Duration of pain (months)		
≤3	71	35.1
>3	131	64.9
Frequency of low back pain		
Daily	27	13.4
2–3 days/week	83	41.1
2–3 weeks/month	62	30.6
Rarely	30	14.9

In agreement with others,^[17,30] smoking was not a predictor for LBP among physicians in the current study. However, in Turkey, smoking was a significant predictor for LBP.^[28]

Some studies have observed an association between MSDs and work-related factors^[23,31,32] among healthcare professionals. The bivariate analysis in the present study revealed that LBP was associated with average working days/week. However, after controlling for confounding effect in multivariate analysis, this effect disappeared. However, others^[28,33,34] documented an association between duration of work and increased risk of LBP among healthcare staff.

Pain-relieving factors

In the current study, as regards the pain-relieving factors, sleeping ranked first, followed by taking analgesics and maintaining a good posture. In another recent Saudi study,^[17] bed rest and painkillers were the most commonly reported therapeutic modalities for LBP. In Riyadh (Saudi Arabia),^[19] most physicians with LBP did not ask for medical help and only took simple analgesics and heat/cold fomentations.

Adverse impacts of LBP

In the current study, LBP had adverse negative impacts on the affected physicians as 16.8% of them had absenteeism days due to LBP. Moreover, 49% of them reported a decrease in quality of work performance as a consequence of their LBP. In another study conducted among physicians recently in Tabuk, Saudi Arabia, considerable pain was reported among them, and as a consequence, 10.8% cannot do their normal work, 15% reported absence from work in the last 3 months, and 40.9% can do light work for an hour.^[17] In another Saudi study done by Almalki *et al.* in Riyadh, approximately 7% of the physicians reported moderate to severe disability as a result of LBP, and 13% had taken days off from work.^[19] In a study conducted in Malaysia among physicians, 7.3% reported absence from work as a consequence of LBP.^[24] This negative impact of LBP on absence from work and work performance of the affected physicians might have public health importance as it affects directly the quality of care provided to patients.

Study limitations

A few limitations of the present study should be mentioned. Recruiting only resident physicians from Abha city could affect our ability to generalize the findings over other places and other categories of physicians. The tool used for data collection is subjected to recall bias as it is a self-administered one. The direction of the cause-effect relationship cannot be determined as a result of the cross-sectional nature of the study. Despite these limitations, the study carries a public health significance in exploring the magnitude and determinants of this important health problem among young physicians, which could affect negatively the quality of care delivered to patients.

Table 5: Factors associated with low back pain among resident physicians in Abha, Kingdom of Saudi Arabia

Variables	Low back pain		P	
	No n=110 n (%)	Yes n=202 n (%)		
Gender				
Male (n=180)	58 (32.2)	122 (67.8)	0.190*	
Female (n=132)	52 (39.4)	80 (60.6)		
Age in years				
Mean±SD	29.6±2.6	29.9±3.1	0.370**	
Marital status				
Single (n=128)	51 (39.8)	77 (60.2)	0.276*	
Married (n=180)	57 (31.7)	123 (68.3)		
Divorced/widowed (n=4)	2 (50.0)	2 (50.0)		
Place of residence				
Within medical residency region (n=234)	83 (35.5)	151 (64.5)	0.891*	
Outside medical residency region (n=78)	27 (34.6)	51 (65.4)		
Smoking status				
Non-smoker (n=216)	83 (38.4)	133 (61.6)	0.154*	
Current smoker (n=70)	18 (25.7)	52 (74.3)		
Ex-smoker (n=26)	9 (34.6)	17 (65.4)		
Body mass index				
Underweight (n=8)	4 (50.0)	4 (50.0)	0.028*	
Normal (n=108)	45 (41.7)	63 (58.3)		
Overweight (n=124)	46 (37.1)	78 (62.9)		
Obese (n=64)	13 (20.3)	51 (79.7)		
Family history of back pain				
No (n=144)	73 (50.7)	71 (49.3)	<0.001	
Yes (n=168)	37 (22.0)	131 (78.0)		
Family history of musculoskeletal disorders				
No (n=252)	91 (36.1)	161 (63.9)	0.517	
Yes (n=60)	19 (31.7)	41 (68.3)		
History of chronic health problems				
No (n=274)	103 (37.6)	171 (62.4)	0.020	
Yes (n=38)	7 (18.4)	31 (81.6)		
Residency level				
R1 (n=76)	29 (38.2)	47 (61.8)	0.365	
R2 (n=78)	24 (30.8)	54 (69.2)		
R3 (n=72)	21 (29.2)	51 (70.8)		
R4 (n=66)	29 (43.9)	37 (56.1)		
R5 (n=20)	7 (35.0)	13 (65.0)		
Specialty				
Family medicine (n=47)	19 (40.4)	28 (59.6)	0.259	
Preventive medicine (n=19)	7 (36.8)	12 (63.2)		
Internal medicine (n=50)	25 (50.0)	25 (50.0)		
General surgery (n=25)	11 (44.0)	14 (56.0)		
Obstetrics/Gynecology (n=27)	6 (22.2)	21 (77.8)		
Pediatrics (n=33)	9 (27.3)	24 (72.7)		
Radiology (n=27)	6 (22.2)	21 (77.8)		
Emergency medicine (n=21)	8 (38.1)	13 (61.9)		
Psychiatry (n=11)	2 (18.2)	9 (81.8)		
Otolaryngology (n=11)	4 (36.4)	7 (63.6)		
Surgery sub-specialty (n=18)	7 (38.9)	11 (61.1)		
Others (n=23)	6 (26.1)	17 (73.9)		
Average daily working hours				
<8 (n=56)	23 (41.1)	33 (58.9)		0.357
8 (n=212)	75 (35.4)	137 (64.6)		
>8 (n=44)	12 (27.3)	32 (72.7)		

Contd...

Table 5: Contd...

Variables	Low back pain		P
	No n=110 n (%)	Yes n=202 n (%)	
Average working days/week			
≤5 (n=254)	97 (38.2)	157 (61.8)	0.023
>5 (n=58)	13 (22.4)	45 (77.6)	
Average number of patients cared per day			
None (n=30)	11 (36.7)	19 (63.3)	0.636
≤15 (n=134)	50 (37.3)	84 (62.7)	
16-30 (n=100)	36 (36.0)	64 (64.0)	
>30 (n=48)	13 (27.1)	35 (72.9)	

*Chi-square test. **Student's t-test

Table 6: Predictors of low back pain among resident physicians in Abha, Saudi Arabia: Multivariate logistic regression analysis

	B	SE	AOR	95% CI	P
Body mass index					
Underweight ^a	0.627	0.767	1.0	---	---
Normal	0.949	0.768	1.87	0.42–8.42	0.414
Overweight	1.821	0.812	2.58	0.57–11.64	0.216
Obese			6.18	1.26–30.34	0.025
Family history of back pain					
No ^a	1.361	0.262	1.0	---	---
Yes			3.90	2.33–6.52	<0.001

^aReference category; B: Slope; SE: Standard error. AOR: Adjusted odds ratio; CI: Confidence interval. Terms of average working days/week and history of chronic health problems were removed from the final model (not significant)

Table 7: Effects of lower back pain on residents in Abha City, Saudi Arabia due to low back pain (n=202)

	Frequency	Percentage
Absenteeism days per month		
None		
Yes	168	83.1
1–4	34	16.9
5–7	29	14.4
>7	3	1.5
	2	1.0
Shortage in performing		
No	103	51.0
Sometimes	93	46.0
Most days	6	3.0

Conclusion

Prevalence of LBP

LBP is a very prevalent problem among resident physicians of all specialties in Abha, Saudi Arabia.

Associated factors

Obese subjects and those with family history of back pain were at higher risk of developing LBP compared to their counterparts. Dull pain was the most commonly reported type of pain.

Aggravating factors

The most commonly reported aggravating factors for LBP were working in uncomfortable posture, standing for long periods, and long sitting sessions.

Pain-relieving factors

Regarding the pain-relieving factors, sleeping ranked first, followed by taking analgesics and maintaining a good posture.

Adverse impacts

LBP had adverse negative impacts on the affected physicians as a considerable proportion of them had absenteeism days and a decrease in quality of work performance as a consequence of their LBP.

Recommendations

Based on the present study's findings, we recommend that prevention programs should be implemented to reduce the frequency of low back injuries in resident physicians and improve their work environment, and refresher courses on back care mechanisms should be organized for resident physicians and other healthcare staff on a regular basis. In addition, the high existence of LBP among resident physicians in the present study needs in-depth investigation concerning the nature of work. The role of different psychosocial risk factors has to be examined in further study, and significant differences have to be tested in groups of physicians regarding job satisfaction and work stress in association with LBP prevalence. Finally, a future larger longitudinal study including physicians working in other healthcare facilities in Abha is recommended. This may help to identify those who are at higher risk for developing LBP so that preventive measures can be undertaken to reduce its occurrence.

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Conflicts of interest

There are no conflicts of interest.

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