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Original Article

Low back pain and its correlations with poor sleep quality among health care providers

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الملخص

أهداف البحث: تهدف هذه الدراسة إلى معرفة العلاقة بين آلام أسفل الظهر وجودة النوم لدى مقدمي الرعاية الصحية في المملكة العربية السعودية.

طرق البحث: تم إجراء دراسة مقطعية معتمدة على الاستبانة مستهدفة مقدمي الرعاية الصحية في المملكة العربية السعودية. حيث تتكون الاستبانة من ثلاثة أقسام؛ القسم الأول يتضمن بيانات السيرة الذاتية للمشاركين. الثاني هو مؤشر أوسويستري للإعاقة بالإضافة إلى استبانة الجهاز العضلي الهيكلي الاسكندنافي لآلام أسفل الظهر. القسم الثالث كان لمؤشر جودة النوم الكلية في تقييم بيتسبرغ.

النتائج: شارك وأكمل الاستبانة ٤٤٢ مستجيبا. ومثل الذكور قرابة ثلثي المستجيبين (٦٢.٧٪). وكان معظم المشاركين يعيشون في المنطقة الوسطى (٢٣.٣٪) أو المنطقة الشمالية (٢٣.٣٪). وقد وُجد أن العلاقة بين مؤشر جودة النوم الكلية في تقييم بيتسبرغ العالمي ودرجة مؤشر أوسويستري للإعاقة ذات دلالة إحصائية عالية بشكل إيجابي، بينما وُجد أن الارتباط بين درجة مؤشر أوسويستري للإعاقة ومكونات مؤشر جودة النوم في تقييم بيتسبرغ، بما في ذلك التقييم الشخصاني لجودة النوم وكفاءة النوم المعتاد والخلل الوظيفي في الفترة النهارية ذات دلالة إحصائية عالية بشكل إيجابي.

الاستنتاجات: أظهر مقدمو الرعاية الصحية في المملكة العربية السعودية الذين يعانون من ارتفاع في معدل الإعاقة في آلام أسفل الظهر جودة نوم أقل بشكل عام والعكس صحيح ومع ذلك، هناك حاجة إلى مزيد من البحث في هذا السياق لمعرفة ما إذا كانت هذه العلاقة سببية.

الكلمات المفتاحية: ألم أسفل الظهر؛ الجهاز العضلي الهيكلي؛ النوم؛ مقدم الرعاية الصحية؛ المملكة العربية السعودية؛ مؤشر أوسويستري للإعاقة؛ مؤشر جودة النوم في تقييم بيتسبرغ.

Abstract

Objective: This study investigates the relationship between low back pain (LBP) and sleep quality among health care workers in KSA.

Methods: In this cross-sectional study, an anonymous questionnaire consisting of three sections was administered to health care providers in KSA. The first part included the biographic data of participants, while the second comprised the Oswestry Disability Index (ODI) and the extended version of the Nordic Musculoskeletal Questionnaire (NMQ-E) for LBP. The third part contained the Pittsburgh Sleep Quality Index (PSQI).

Results: A total of 442 healthcare providers completed the questionnaire. Nearly two-thirds of the respondents were male (62.7%). Most were living in either the central region (23.3%) or the northern region (23.3%). There was a statistically significant correlation between the global PSQI and ODI score ($r = 0.235$; $p < 0.001$). The correlation between ODI score and PSQI components including subjective sleep quality ($r = 0.229$; $p = 0.007$), habitual sleep efficiency ($r = 0.229$; $p < 0.01$), and the daytime dysfunction was also statistically significant.

Conclusion: Health care providers in KSA with high rating for LBP disability demonstrated poorer overall sleep quality and vice versa. However, further research is essential to investigate whether this relationship is causal.

Keywords: Health care provider; KSA; Low back pain; Musculoskeletal; Oswestry Disability Index; Pittsburgh Sleep Quality Index

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Introduction

Low back pain (LBP) is a very common complex major symptom.[1] In terms of causality, LBP is classified into non-specific causes such as occupational and specific causes such as disc herniation.[2,3] It is the most common occupational and work-related musculoskeletal symptom worldwide and occurs due to a wide variety of causes, which could be specific or more frequently non-specific.[2,3] LBP is considered a major occupational injury, and its prevalence among the general population has been reported to range from 15% to 45% globally, while it was found to be almost twice as prevalent among health care providers (HCPs) than other occupations.[4] In KSA, several studies have been conducted in the southwestern region,[5] Tabuk,[6] and Jeddah.[7] The results revealed that prevalence of LBP among HCPs ranges between 53% and 73.9%.[5–7] LBP can negatively impact daily activities, productivity, psychological wellbeing, socioeconomic status, workers' health, and sleep.[8] On the other hand, sleep is a cornerstone of quality of life determinants, playing a crucial role in homeostasis and promoting human's physical and mental health.[7] Sleep disturbance is linked to negative social and health outcomes including fatigue, and poor work performance.[9] The prevalence of poor sleep quality is higher in HCPs than the general population and this can be due to their stressful tasks, work shifts, workload, and long standing hours, which can result in poor patient care, work efficacy, and increased medical errors.[10–12] In KSA, a study among training residents concluded that 86.3% had poor sleep quality.[13] Another study conducted in Najran found that 42.3% of HCPs were poor sleepers.[14] In addition, poor sleep quality was found to be highly associated with musculoskeletal problems, most commonly and significantly LBP.[15,16] Furthermore, among HCPs, poor sleep was found to be a risk factor for LBP.[17] Although LBP affects sleep duration and quality significantly, the relationship between pain and quality of sleep is bidirectional; sleep disturbance can increase pain, which in turn may cause sleep disorders.[15–18] To date, most studies have investigated the relationship between LBP and sleep quality in terms of clinical aspect and clinically oriented methods. However, such studies are unsatisfactory because the reciprocal relationship of LBP and sleep quality among unknown-LBP individuals especially HCPs was ignored. To the best of our knowledge, this reciprocal relationship is still unresolved. Given the above, this study establishes the relationship between LBP and sleep quality among HCPs in KSA.

Materials and Methods

Study design

A qualitative cross-sectional anonymous questionnaire-based study was performed among HCPs with LBP from different regions of KSA.

Study population and sample size calculation

The study involved 442 participants and the age range was between 20 and 60 years old. The participants were HCPs including physicians, surgeons, nurses, pharmacists, and others who are involved in providing medical care. There are approximately 384,636 HCPs in KSA registered with the Saudi Council For Health Specialties (SCFHS).[19] According to Cochran's Formula, the sample size should not be less than 384 participants with 95% confidence interval and 5% margin of error.

Data collection

Before completing the questionnaires, informed consent, stating the demands of the study, was obtained from those who agreed to participate. Exclusion criteria included those who have co-morbidities, history of spinal surgeries or trauma/fractures, history of musculoskeletal pain other than LBP, history of primary insomnia, and history of mental illness or treated for a psychiatric disease.

Statistical analysis

Data are presented as percentages for all qualitative variables while mean, standard deviation, and median (min–max) are used for quantitative variables. Between comparisons, Chi-square tests, Mann–Whitney U test and Kruskal Wallis test were applied, whenever appropriate. Normality, statistical interactions, and collinearity (i.e., variance inflation factor) were also assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. P-value <0.05 was considered statistically significant. Correlation procedures were also conducted to determine the linear agreement between ODI total score and PSQI with its components. All data analyses were carried out using Statistical Packages for Software Sciences (SPSS) version 21 (IBM Corporation, Armonk, New York).

Study procedure

All participants completed a self-report measure of sleep quality and LBP using the extended version of the Nordic Musculoskeletal Questionnaire (NMQ-E)[20] with Oswestry Disability Index (ODI)[21] and Pittsburgh Sleep Quality Index (PSQI).[22,23] NMQ-E was used to determine the presence of LBP.[20] ODI aims to explore the extent to which LBP causes limitation and disturbance in the HCP's daily activities.[21] By combining the two questionnaires (NMQ-E and ODI), we could identify sufferers of LBP and its impact on the HCPs. Retrieved data included HCPs' age, sex, and other demographic data items as well as clinical history of LBP and sleep disturbance.

Extended version of the Nordic Musculoskeletal Questionnaire

NMQ-E is self-administered, with easy-to-understand multiple choice questions. This questionnaire is used to identify pain in multiple locations of the body.[20] Therefore, this questionnaire was used to identify and include those who only have LBP.

Oswestry Disability Index

ODI is a self-administered validated reliable questionnaire used to identify the extent of limitation and disturbance in daily life activities caused by LBP.[21]

Pittsburgh Sleep Quality Index

This instrument was used to assess efficacy and quality of sleep. Domains include sleep duration, latency, frequency, and severity of specific sleep-related issues and the impact of poor sleep on daytime functioning.[22,23]

Results

This study involved 442 health care providers (HCPs) to examine the relationship between LBP and sleep quality. The sociodemographic characteristics of the 442 HCPs are reported in Table 1. The most common age group was 20–30 years (76%) and nearly two-thirds were male (62.7%) while the rest were female (37.3%). With respect to their marital status, 71.5% were single and most were living in either the central region (23.3%) or northern region (23.3%). With

Table 1: Sociodemographic characteristics of healthcare providers according to LBP.

Study Variables	Overall $^{(n = 442)}$ N (%)	Low Back Pain		P-value[§]
		With LBP $^{(n = 242)}$ N (%)	Without LBP $^{(n = 200)}$ N (%)	
Age Group				
• 20–30 years	336 (76.0%)	181 (74.8%)	155 (77.5%)	0.507
• >30 years	106 (24.0%)	61 (25.2%)	45 (22.5%)	
Gender				
• Male	277 (62.7%)	123 (50.8%)	154 (77.0%)	**<0.001****
• Female	165 (37.3%)	119 (49.2%)	46 (23.0%)	
Marital status				
• Single	316 (71.5%)	159 (65.7%)	157 (78.5%)	**0.003****
• Married	126 (28.5%)	83 (34.3%)	43 (21.5%)	
Region of residence				
• Central region	103 (23.3%)	69 (28.5%)	34 (17.0%)	**<0.001****
• Eastern region	96 (21.7%)	67 (27.7%)	29 (14.5%)	
• Northern region	103 (23.3%)	48 (19.8%)	55 (27.5%)	
• Southern region	76 (17.2%)	24 (09.9%)	52 (26.0%)	
• Western region	64 (14.5%)	34 (14.0%)	30 (15.0%)	
Years of experience				
• <5 years	317 (71.7%)	158 (65.3%)	159 (79.5%)	**0.001****
• ≥5 years	125 (28.3%)	84 (34.7%)	41 (20.5%)	
Number of working hours/week				
• 20–30 h	112 (25.3%)	63 (26.0%)	49 (24.5%)	0.977
• 31–40 h	113 (25.6%)	61 (25.2%)	52 (26.0%)	
• 41–50 h	116 (26.2%)	64 (26.4%)	52 (26.0%)	
• >50 h	101 (22.9%)	54 (22.3%)	47 (23.5%)	
Work schedules				
• Regular	222 (50.2%)	121 (50.0%)	101 (50.5%)	0.995
• Shifts	60 (13.6%)	33 (13.6%)	27 (13.5%)	
• Both	160 (36.2%)	88 (36.4%)	72 (36.0%)	
Being "on call"				
• Yes	152 (34.4%)	97 (40.1%)	55 (27.5%)	**0.006****
• No/Maybe	290 (65.6%)	145 (59.9%)	145 (72.5%)	
Frequency of "on call" per week $^{(n = 152)}$				
• <3 times	113 (74.3%)	79 (81.4%)	34 (61.8%)	**0.008****
• ≥3 times	39 (25.7%)	18 (18.6%)	21 (38.2%)	
BMI level				
• Underweight	20 (04.5%)	15 (06.2%)	05 (02.5%)	0.158
• Normal	203 (45.9%)	112 (46.3%)	91 (45.5%)	
• Overweight	132 (29.9%)	65 (26.9%)	67 (33.5%)	
• Obese	87 (19.7%)	50 (20.7%)	37 (18.5%)	
Smoking	74 (16.7%)	36 (14.9%)	38 (19.0%)	0.248
Taking sleeping medications for the last 6 months	95 (21.5%)	58 (24.0%)	37 (18.5%)	0.164
Taking medication	74 (16.7%)	52 (21.5%)	22 (11.0%)	**0.003****

[§]P-value has been calculated using Chi-square test. **: Significant at $p < 0.05$ level.
LBP: Low back pain.

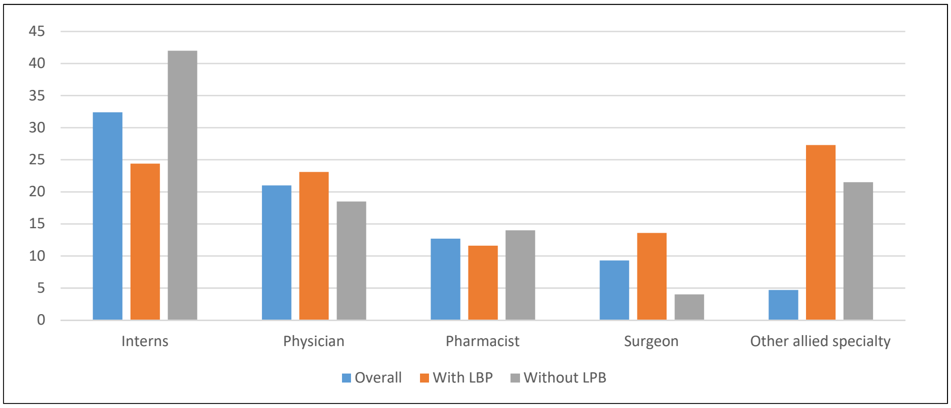

Figure 1: Frequency of LBP among health care specialties. LBP: Low back pain.

regards to years of experience, approximately 72% had less than five years of experience. A total of 26.2% were working 41−50 h per week. Similarly, approximately half (50.2%) had a regular shift duty with 34.4% regularly "on call" at a frequency of less than three times per week (74.3%). With regards to respondents' body mass index (BMI), nearly half (45.9%) showed normal BMI, 29.9% were overweight, and 16.7% were obese. The prevalence of smoking was 16.7%. The prevalence of participants who were taking sleeping medications was 21.5% and 16.7% for those taking other medications. In the comparison of LBP, we observed that gender ($p < 0.001$), marital status ($p = 0.003$), residence region ($p < 0.001$), years of experience ($p = 0.001$), being "on call" ($p = 0.006$), frequency of being "on call" per week ($p = 0.008$), and taking medication ($p = 0.003$) were significantly associated with LBP.

The distribution of LBP among medical specialties is presented in Figure 1. LBP was found to be higher among other allied specialties followed by interns and physicians, while it was less prevalent among pharmacists.

The characteristics of LBP among HCPs obtained from both E-NMQ and ODI are reported in Table 2. Based on the results, 36.4% of HCPs reported that their back pain lasted for around less than seven days. The proportion of HCPs who have been hospitalised due to LBP, those who were prevented from engaging in normal work, and those who changed jobs due to LBP were 8.7%, 41.7%, and 16.9%, respectively. A total of 16.1% had taken one to two periods of sick leave due to LBP during the last month. The most frequently mentioned length of LBP persistence was less than 24 h (40.1%). Similar, leisure and work activities had been reduced due to LBP (35.5%) while nearly two-thirds of HCPs (64.5%) indicated that the average duration of LBP that prevented them from doing normal work was less than 24 h. The proportion of HCPs who seek medical assistance due to LBP was 1.2% while that of those who visited hospital due to LBP was 26.9%. Doctors had the highest proportion of hospital visits due to LBP (56.9%). In addition, the proportion of respondents who did regular exercise was 40.5% with 56.1% reporting that exercise improved their LBP.

The descriptive statistics of ODI and PSQI scores are reported in Table 3. The mean score of ODI was 7.83 (SD 6.69) while that of global PSQI was 7.14 (SD 3.42). With regards to PSQI components, the mean score was higher

Table 2: Characteristics of healthcare providers with LBP $^{(n = 242)}$.

Variables	N (%)
Occurrence of LBP:	
• <7 days ago	88 (36.4%)
• 30 days ago	45 (18.6%)
• About a year ago	50 (20.7%)
• More than a year ago	59 (24.4%)
Hospitalisation due to LBP	21 (08.7%)
Prevented from doing normal work due to LBP	101 (41.7%)
Changing job due to LBP	41 (16.9%)
No. of periods of sick leave due to LBP in the last month:	
• None	190 (78.5%)
• 1−2	39 (16.1%)
• 3−4	06 (02.5%)
• 5−6	04 (01.7%)
• 7−8	01 (0.40%)
• >10	02 (0.80%)
Total duration of LBP:	
• <24 h	97 (40.1%)
• 1−7 days	93 (38.4%)
• 8−30 days	17 (07.0%)
• >30 days	35 (14.5%)
Reduced activity due to LBP:	
• None	79 (32.6%)
• Leisure activities	31 (12.8%)
• Work activities	46 (19.0%)
• Both	86 (35.5%)
Total length of time of LBP preventing normal work:	
• <24 h	156 (64.5%)
• 1−7 days	52 (21.5%)
• 8−30 days	12 (05.0%)
• >30 days but not everyday	19 (07.9%)
• Everyday	03 (01.2%)
Seek medical assistance due to LBP	65 (26.9%)
Healthcare provider visits due to LBP $^{(n = 65)}$:	
• Doctor	37 (56.9%)
• Physiotherapist	07 (10.8%)
• Both	12 (18.5%)
• None of the above	09 (13.8%)
Regular exercise	98 (40.5%)
Does exercise worsen or improve LBP? $^{(n = 98)}$:	
• Worsen	10 (10.2%)
• Improve	55 (56.1%)
• No change	33 (33.7%)

LBP: Low back pain.

Table 3: Descriptive statistics of Oswestry Disability Index (ODI) and Pittsburgh Sleep Quality Index.

Variables	Mean ± SD	Mean (%)	Median (Min−Max)
ODI total score	7.83 ± 6.69	20.6%	6.00 (0.00−38.00)
Global PSQI score	7.14 ± 3.42	47.6%	7.00 (0.00−15.00)
PSQI components:			
• Subjective sleep quality	1.16 ± 0.78	38.7%	1.00 (0.00−03.00)
• Sleep latency	1.37 ± 1.06	45.7%	1.00 (0.00−03.00)
• Sleep duration	1.19 ± 1.02	39.7%	1.00 (0.00−03.00)
• Habitual sleep efficiency	1.07 ± 1.29	35.7%	0.00 (0.00−03.00)
• Sleep disturbance	1.15 ± 0.67	38.3%	0.00 (0.00−03.00)
• Use of sleep medication	0.38 ± 0.78	12.7%	0.00 (0.00−03.00)
• Daytime dysfunction	0.97 ± 0.96	32.3%	1.00 (0.00−03.00)

SD: Standard deviation. ODI: Oswestry Disability Index. PSQI: Pittsburgh Sleep Quality Index.

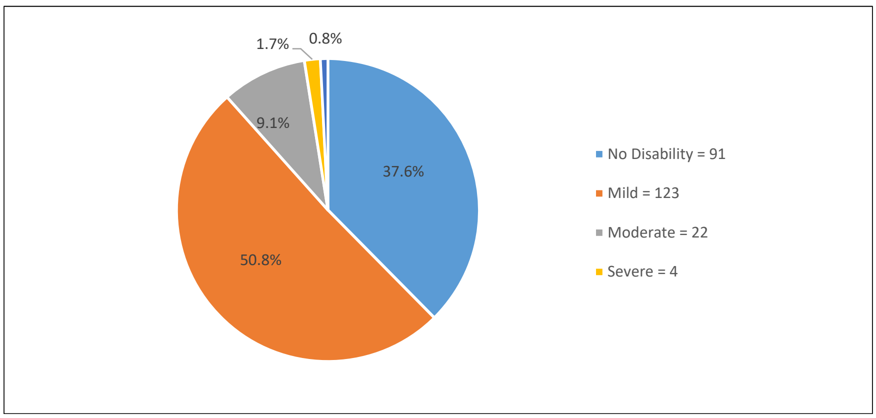

Figure 2: Level of disability according to ODI. ODI: Oswestry Disability Index.

for sleep latency (mean: 1.37; SD 1.06) while it was lower for the use of sleep medication (mean: 0.38; SD 0.78).

The level of disability of HCPs is illustrated in Figure 2. It was revealed that more than a half (50.8%) were detected with mild disability, followed by moderate (9.1%) and severe (1.7%).

In Figure 3, the most commonly affected component of PSQI was sleep latency, followed by sleep duration and subjective sleep quality while use of sleep medication was the least affected.

The correlation procedure between ODI score and the PSQI components is described in Table 4. The correlation between global PSQI and ODI score was positively highly statistically significant ($r = 0.235$; $p < 0.001$) (Figure 4) while that between ODI score and PSQI components including subjective sleep quality ($r = 0.229$; $p = 0.007$), habitual sleep efficiency ($r = 0.229$; $p < 0.01$), and daytime dysfunction were also positively highly statistically significant.

We measured the association between ODI and global PSQI score in relation to the sociodemographic characteristics and previous history of LBP. ODI score was found to be statistically significantly higher among older age groups ($T = -2.815$; $p = 0.019$), married HCPs ($T = -2.775$; $p < 0.001$), those in the allied specialties ($F = 3.853$;

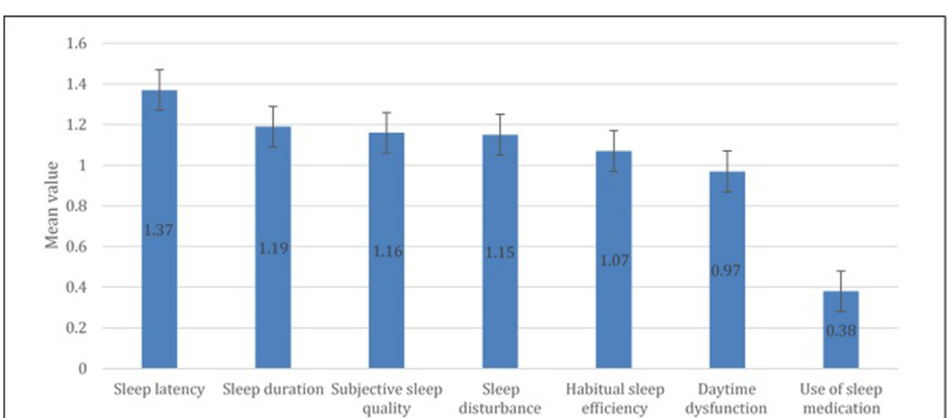

Figure 3: Mean distribution of PSQI components.

Table 4: Correlation (Pearson − R) between ODI score and PSQI components.

Variables	ODI total score R-value	P-value
Global PSQI score	0.235	**<0.001****
PSQI components		
• Subjective sleep quality	0.174	**0.007****
• Sleep latency	0.056	0.387
• Sleep duration	−0.021	0.746
• Habitual sleep efficiency	0.110	0.089
• Sleep disturbance	0.229	**<0.001****
• Use of sleep medication	0.116	0.071
• Daytime dysfunction	0.236	**<0.001****

**Correlation is significant at the 0.01 level (2-tailed). ODI: Oswestry Disability Index. PSQI: Pittsburgh Sleep Quality Index.

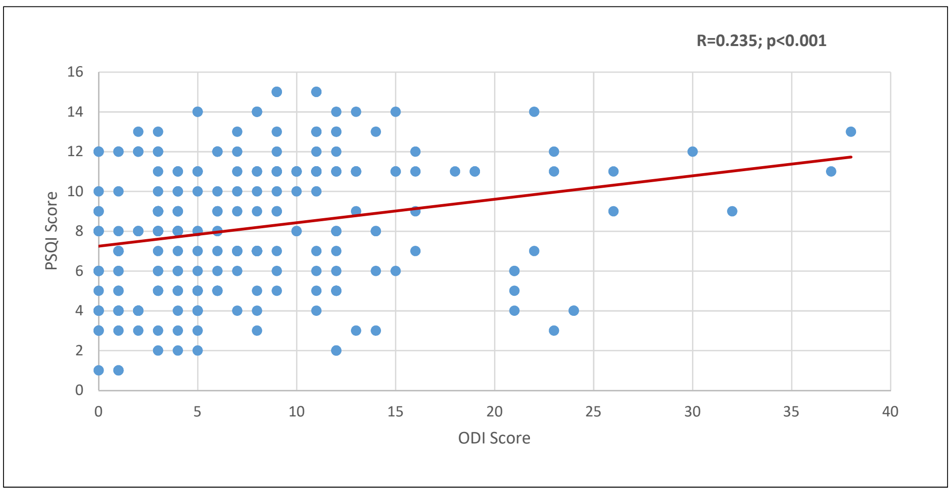

Figure 4: Correlation (Pearson - R) between ODI score and PSQI score. ODI: Oswestry Disability Index. PSQI: Pittsburgh Sleep Quality Index.

Table 5: ODI score and global PSQI score among the healthcare providers with previous history of LBP $^{(n = 242)}$.

Factor	ODI Total Score (50) Mean ± SD	T/F test; P-value	Global PSQI Total Score (21) Mean ± SD	T/F test; P-value
Age group[a]				
• 20−30 years	7.13 ± 5.95	T = −2.815;	7.91 ± 3.34	T = −2.106;
• >30 years	9.89 ± 8.26	**0.019****	8.95 ± 3.30	0.059
Gender[a]				
• Male	7.47 ± 6.63	T = −0.837;	7.89 ± 3.09	T = −1.356;
• Female	8.19 ± 6.78	0.259	8.47 ± 3.59	0.183
Marital status[a]				
• Single	6.97 ± 6.61	T = −2.775;	8.01 ± 3.27	T = −1.073;
• Married	9.46 ± 6.60	**<0.001****	8.49 ± 3.51	0.284
Region of residence[b]				
• Central region	8.36 ± 7.24	F = 0.646;	8.84 ± 3.13	F = 2.098;
• Eastern region	7.89 ± 6.48	0.443	8.55 ± 3.75	0.089
• Northern region	7.69 ± 6.78		7.60 ± 3.33	
• Southern region	5.88 ± 5.72		7.71 ± 3.18	
• Western region	8.18 ± 6.63		7.21 ± 2.89	
Medical Specialty[b]				
• Physician	8.38 ± 6.87	F = 3.853;	7.41 ± 3.29	F = 2.002;
• Surgeon	7.42 ± 7.06	**<0.001****	8.42 ± 3.36	0.116
• Pharmacist	8.07 ± 7.55		7.96 ± 3.13	

(continued on next page)

Table 5 (*continued*)

Factor	ODI Total Score (50) Mean ± SD	T/F test; P-value	Global PSQI Total Score (21) Mean ± SD	T/F test; P-value
• Intern	5.25 ± 5.72		7.89 ± 2.89	
• Other allied Specialty	9.76 ± 6.24		9.03 ± 3.77	
Years of experience[a]				
• <5 years	6.72 ± 5.98	T = −3.627;	7.79 ± 3.30	T = −2.455;
• ≥5 years	9.92 ± 7.48	<**0.001****	8.89 ± 3.36	**0.026****
Number of working hours/week[b]				
• 20−30 h	7.48 ± 5.74	F = 2.194;	7.86 ± 3.55	F = 1.176;
• 31−40 h	6.21 ± 5.23	0.141	7.75 ± 3.37	0.408
• 41−50 h	8.95 ± 8.32		8.75 ± 3.17	
• >50 h	8.72 ± 6.83		8.33 ± 3.31	
Work schedules[b]				
• Regular	7.07 ± 6.75	F = 1.871;	8.29 ± 3.47	F = 1.294;
• Shift	7.82 ± 5.19	0.118	7.30 ± 3.02	0.314
• Both	8.88 ± 7.05		8.34 ± 3.31	
Being "on call"[a]				
• Yes	7.06 ± 5.72	T = −1.456;	8.22 ± 3.28	T = 0.162;
• No/Maybe	8.34 ± 7.25	0.213	8.14 ± 3.42	0.874
Smoking[a]				
• Yes	8.28 ± 7.35	T = 0.437;	7.75 ± 3.06	T = −0.820;
• No	7.75 ± 6.59	0.964	8.25 ± 3.41	0.377
Taking sleeping medications for the last 6 months[a]				
• Yes	9.57 ± 6.62	T = 2.292;	9.38 ± 3.49	T = 3.196;
• No	7.28 ± 6.65	**0.002****	7.79 ± 3.23	**0.003****
Taking medication[a]				
• Yes	8.77 ± 6.61	T = 1.146;	9.54 ± 3.47	T = 3.379;
• No	7.57 ± 6.72	0.167	7.80 ± 3.24	**0.002****
Regular exercise[a]				
• Yes	7.93 ± 6.41	T = 0.192;	7.79 ± 3.28	T = −1447;
• No	7.76 ± 6.91	0.672	8.43 ± 3.39	0.112

** Significant at $p < 0.05$ level.
ODI: Oswestry Disability Index. PSQI: Pittsburgh Sleep Quality Index. LBP: Low back pain.
[a] P-value has been calculated using Chi-square test.
[b] P-value has been calculated using Kruskal Wallis test.

$p < 0.001$), those with five or more years of experience ($T = -3.627$; $p < 0.001$), and those who were taking sleeping medications ($T = 2.292$; $p = 0.002$). On the other hand, global PSQI score was statistically significantly higher among those with five or more years of experience ($T = -2.455$; $p = 0.026$) and those who were taking sleeping medications ($T = 3.196$; $p = 0.003$). In contrast, gender, residence region, number of working hours/week, regular working shift schedules, being on call, and smoking did not differ significantly when compared to both ODI score and global PSQI score (all $p > 0.05$) (see Table 5).

Discussion

LBP is considered one of the most common occupational musculoskeletal complaints among HCPs in KSA.[2,3,5−7] Furthermore, sleep quality is found to be poor, with sleep often disturbed, among this group.[14−16] Since there are limited studies on this issue, this cross-sectional study investigated the relationship and its related factors between LBP and sleep quality among HCPs in KSA. A total of 442 HCPs (physicians, surgeons, pharmacists, interns, and other allied specialties) participated in the study. Of these, 242 reported suffering LBP. Interestingly, gender, marital status, residence region, years of working experience, being on call, frequency of "on call" per week, and taking medication were found to be significantly associated with LBP. Moreover, the ODI score and PSQI components including subjective sleep quality, habitual sleep efficiency, and daytime dysfunction were also positively highly statistically significant.

The findings revealed that multiple sociodemographic characteristics significantly influenced LBP, including gender, marital status, region of residence, years of working experience, being on call with increased frequency per week, and taking medications (Table 1). The results confirm that those aged between 20 and 30 years are associated with a higher chance of LBP than older people. This is in line with previous studies conducted in KSA suggesting that LBP among HCPs is more prevalent among younger patients.[24] This could be because this age group comprises the most economically active period of one's career. However, this conflicts with the evidence that considers ageing as a risk factor for LBP.[25] Moreover, we found that male HCPs are more likely to be affected with LBP compared to females. This explains why males, especially singles living in the eastern or central regions, have a higher probability of developing work-related LBP. This was inconsistent with previous research that found that LBP is more common in females than males.[4,5,24] However, this study has reliable and significant advantages over previous studies in which gender was not statistically significant. In addition, although it significantly affects LBP, pregnancy was not excluded in previous studies.[24] Additionally, the present study found a positive association between increased years of experience and increased incidence of LBP among HCPs. This describes the negative impact in which successive and repetitive workload increases LBP year by year. This fills a gap in the literature and confirms the relationship addressed in previous global studies.[6,7] Moreover, the present study revealed a significant association between "on call" shifts/increased hours of work and LBP among HCPs. A previous study conducted in KSA found no significant relationship between amount of workload/shifts and LBP while a global study identified a significant relationship, which corresponds with our findings.[6,7] However, this study revealed that LBP among HCPs was more common among those who have a normal BMI Score than those with higher scores, which is inconsistent with what has been previously found locally and globally.[5] A major advantage of this study is that most of the previous research attempts to determine LBP and the characterstics of LBP among HCPs within a specific specialty or facility or region rather than the entire population of HCPs in KSA.[4,5,24]

As reported in Table 2, the largest proportion of HCPs have LBP that lasts for less than seven days. This indicates that LBP among most of HCPs involved in this study was acute. This may prevent them from resuming work effectively and functionally. Furthermore, the majority of the participants' LBP lasted, on average, for hours, and only a few requested sick leave (1-2 days). This corresponds with in the results of a systematic review conducted locally that revealed the majority of HCPs describe their LBP as acute.[26] However, others suffer from what can be classified as chronic LBP. Fortunately, this suggests the highest percentage of HCPs in this study suffer from mild LBP in terms of intensity and severity. One study conducted locally found that most physicians described their LBP as moderate in intensity.[4] Another study stated that around 38% had severe LBP, slightly higher than those who described their pain as mild.[4] In terms of the relationship between exercise and LBP, those who indicated they engaged in regular exercise (56.1%) reported that exercise has positively impacted and improved their LBP. This is strongly suggests that exercise is a protective and therapeutic factor for LBP that needs to be highly emphasised in either prevention or management of LBP.[5,7,24]

As illustrated in Figure 1, the incidence of LBP among different medical specialties was assessed. The chance of developing occupational LBP is higher among those working in other allied specialties (surgeons, nurses, dentists, paramedics dietitians, technicians, physiotherapist), followed by interns and physicians. The least commonly affected specialty was pharmacists. This finding correlates with what has been previously found locally in KSA regarding LBP incidence among HCPs.[5,24] Since most previous studies focused on the incidence within a specific facility, region, or specialty,[5,6] the current study provides a beneficial overview about the general local incidence and distribution of LBP among different healthcare specialties in KSA.

Our results are similar to those of a previous study, which states that there is a significant relationship between higher pain ratings and poor sleep quality.[27] Nevertheless, our findings revealed no significant statistical relationship between shift work and sleep quality. This contradicts previous research that proposed that shift workers have poorer sleep quality.[28] As in previous research, we find that poor sleepers are significantly more likely to take sleep medications.[29] Our findings suggest that there is no significant statistical relationship between regular exercise and improving sleep quality, which conflicts with previous studies.[5,7] Unlike a previous study revealed that sleep disturbance, subjective sleep quality, and sleep latency were the most affected components, our findings indicate sleep latency and duration were most affected, followed by subjective sleep quality.[30] Previous research has reported a significant relationship between LBP and the PSQI components including longer sleep onset latency, a higher number of awakenings after sleep onset, a longer total wake time, and lower sleep efficiency.[31] However, our results suggest that LBP is significantly associated with other components such as global PSQI score, subjective sleep quality, sleep disturbance, and daytime dysfunction. Moreover, we also find that poor sleep quality is significantly associated with higher LBP rating.[31] This may be caused by sleep deprivation, which could result in lowering of pain threshold.[18]

Limitations

In addition to the limitation of the questionnaire being distributed electronically, there were issues in terms of distributing it equally among different HCPs. Thus, the authors recommend that further research with a larger sample size from different specialities is needed to confirm our findings.

Conclusion

Multiple sociodemographic characteristics are significantly associated with higher LBP disability rating, including older age group, male gender, married HCPs, those in the allied specialties, those with five or more years of experience, and those who were taking sleeping medications. Most HCPs reported mild intensity LBP with low need for hospitalisation. In addition, participants who exercise regularly and suffer from LBP reported that exercise positively impacted and improved their pain. This study identified a highly statistically significant correlation between ODI score and global PSQI components including subjective sleep quality, habitual sleep efficiency, and daytime dysfunction, which reflects that LBP is associated with poor sleep quality.

Recommendations

Since LBP and poor sleep quality are relatively common among HCPs, their health status should be screened on a regular basis. In addition, the authors recommend that current and future HCPs should determine the cause of LBP and treat it accordingly to ensure they can maintain their levels of productivity. Moreover, they should have a sufficient amount of sleeping hours since it may help in reducing the pain, which may affect their productivity.

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Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

Ethical approval was obtained from the ethical committee of College of Medicine, King Faisal University, Al-Ahsa, KSA [IRB 2020-10-09, dated 15th April 2020] before commencement of the study.

Consent

Consent was taken from each participant after explaining the research idea and his role in participation.

Authors' contributions

NMA critically reviewed the manuscript, identified the appropriate method of analysis and helped in execution and planning of the research. RAB contributed into the conceptualisation of the idea and the survey, the literature search, and wrote the introduction. MNA analysed the data, organised the data and references, and wrote the discussion. BFA wrote the methodology, reviewed the first draft, and interpreted the results. MSA contributed in enriching references, wrote the discussion with MNA, and wrote the final draft. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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