

Health Care Workers's Low Back Pain (Lbp) Prevalence And Risk Factors; A Study At Najran University Hospital

Wael M. Alzahrani¹

¹Assistant professor & consultant of orthopedic surgery. Department of Surgery, College of Medicine, Najran University, Najran, Saudi Arabia

***Corresponding author:** Wael M. Alzahrani, Assistant professor & consultant of orthopedic surgery. Department of Surgery, College of Medicine, Najran University, Najran, Saudi Arabia, Email: w.aldehri@hotmail.com

Submitted: 24 April 2023; Accepted: 19 May 2023; Published: 15 June 2023

ABSTRACT

Background: Untreated low back pain (LBP) is one of the most common health issues and the most widespread type of musculoskeletal disorder. It is one of the leading causes of absenteeism among workers and this extends to Saudi Arabian healthcare workers as well.

Objective: The purpose of this study was to use a self-design questionnaire to determine the prevalence of LBP and examine possible risk variables among all types of HCWs employed at various levels of care in Najran University Hospital

Methods: This study used a cross-sectional design. A self-made questionnaire that the researchers employed was based on the most recent literature that had been published. After the tools were validated, data were gathered between December 2021 and March 2022 utilizing a questionnaire and online forms.

Results: Participants in the research had a median age of 36 years and a mean age of 37.43 + 7.13 years. The age range with the highest prevalence was (31-40 years) (n=47, 56%). Participants in the research had an average BMI of 27.65 kg/m². Among the study participants, 38 of the enrolled subjects claimed to experience low back pain. Participants with low back pain were 4.325 times more likely than non-painful participants to experience long-term low back discomfort. Additionally, those who worked night shifts had a 1.62 times greater chance of acquiring low back pain condition (95% CI: 1.05, 2.86).

Conclusion: LBP is a prevalent issue among HCWs. Numerous preventable risk factors have been identified, including strenuous back injuries, higher BMIs, and a lack of regular physical activity. Programs for workplace health and safety that encourage regular exercise and offer ergonomically secure working conditions are necessary.

Keywords: *Study, Low, Participants, long-term, physical*

BACKGROUND

Around the world, low back pain (LBP) is relatively common (1). In Saudi Arabia, this number ranges from 18.8% (2) to 53.5% (3). Simultaneously, LBP is considered one of the main causes that leads to the loss of productive work time among workers and is to be blamed for the amount of workdays they end up missing (4). In fact, in Saudi Arabia, 15.3 % of employees reported absences from work owing to LBP, 24.1% of employees experienced shortened workdays, and 29.2% of employees reported limited job activities (3).

LBP acts as a major factor that causes health care personnel to miss days at work (5-9). Previous research found that 10.9 % (54.4 %) of health professionals with LBP reported that they used their sick days because of it (5, 10) which could last from anywhere between 2 to 10 days for 71% of them (7). Around 70% to 85% of those polled stated that work related activities caused LBP for them (11-13). (5, 8) Other effects of LBP mentioned by Saudi health professionals vary from restricted social, recreational, and everyday activities (5, 7, 8) to seeking medical care, hospitalization, and even surgery (6, 7, 10, 14, 15).

In recent years, there has been a rapid increase in the number of publications published examining the prevalence and risk factors of LBP among various categories of health professionals in various regions of Saudi Arabia. Studies have revealed a broad variety of LBP prevalence rates. For instance, it has been observed that the annual incidence of LBP among medical professionals in Saudi Arabia ranges from 46.5 % (16) to 92.6% (17). In these studies, age and gender were shown to be personal risk factors that were associated with these rates. Heavy workloads, manual patient handling, and workplace problems were also highlighted as workplace difficulties.

One of the main causes of morbidity for healthcare workers (HCWs) is LBP, and 18.7% of those with chronic LBP took analgesics or other painkillers (18). When compared to a number of other occupational groups, study done in Sweden among HCWs indicated a prevalence of LBP of 77% (19). This issue is connected with serious personal and occupational implications, such as impairment and frequent absence. LBP may cause activity limitations and cause more than half of these HCWs to take sick leaves (5).

HCWs work in a range of settings including doing tasks that expose them to multiple factors that have been associated with increased risk of developing LBP (20). A higher frequency of LBP among healthcare professionals has been associated with a number of professional and personal traits (1). Personal risk variables mentioned were age, gender, smoking, obesity, and poor health condition. The observed workplace variables, on the other hand, included increased muscle sprains and strains as a result of vigorous job activity; extended standing, sitting, and carrying of heavy things; and psychological stress (5, 21-24).

Saudi Arabia's LBP issue is comparable to that of other parts of the world. Several studies have examined the frequency of LBP among Saudi HCWs (25) however, the ratings were lacking in terms of pain descriptions and related variables. The current study aimed to determine the prevalence of LBP across all types of HCWs working at various levels of care in Najran University Hospital, as well as to investigate potential risk factors.

METHODOLOGY

Study Design

A cross sectional research design was used for this study. The study is descriptive and correlational. Since the study aims to determine the prevalence of LBP across all types of HCWs working at various levels of care in Najran University Hospital, as well as to investigate potential risk factors, this is the most appropriate design for the study objectives.

Study Setting

The study was conducted at Najran University Hospital. Data were collected prospectively using online forms during the period from December 2021 to March 2022.

Participants and sampling

The study included licensed healthcare workers from different specialties at Najran University Hospital who have at least one year of work. The study included 84 participants; half of them were males and the other half were females giving a male-to-female ratio of 1:1. The mean age among study participants was 37.43 years \pm 7.13 years with a median age of 36 years. The most prevalent age group was (31-40 years) (n= 47,

56%). Age group distribution is presented in Figure

1. The mean weight among study participants was 76.01 kg \pm 15.28 kg with a median weight of 76.5 kg while the mean height among study participants was 1.658 m \pm 9.4 m with a median height of 1.65 m. This means that the mean body mass index among study participants is 27.65 kg/m² which reflects the overweight category among study participants.

However, there are certain exclusion criteria:

- Healthcare workers that have been taking analgesics for a long time.
- Health care workers with chronic medical illness.
- Healthcare workers with a history of admission to the surgical department.
- Health care workers with clear skeletal deformity.

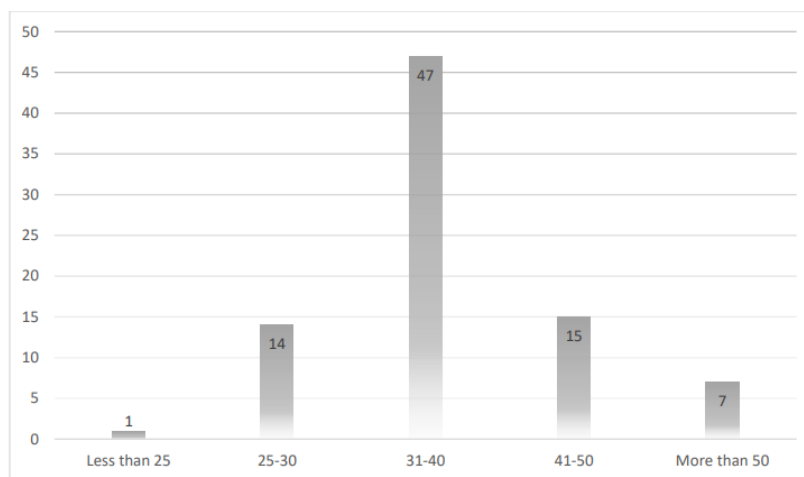


FIGURE 1: Age Group Distribution among Study Participants

Data collection

For the collection of data from participants, an online questionnaire was used after the validation of tools. Researchers used a self-designed questionnaire based on the most recent published literature.

Instruments

The study tool is a self-designed questionnaire based on the most recent published literature. The questionnaire included basic information about the participant (gender, age weight, height, number of working hours, and other baseline information), the Back Pain Functional Scale with an intra-class correlation coefficient for this scale is 0.88 at a 77% confidence level [26], and the Oswestry Low Back Pain Scale with a test retest reliability of 0.93 [27].

Statistical Analysis

The SPSS program version 23 software was used

to enter and evaluate the data collected from the questionnaire. Descriptive statistics such as means, medians, percentages, and standard deviation were used to present sociodemographic data. To demonstrate the statistical significance between patient features and tool scores, independent T-test and one-way ANOVA were utilized. To demonstrate the link between categorical variables, the Chi-square test was employed. To determine the contributing determinants of WMSDs among healthcare providers, a multivariable logistic regression analysis was conducted. The adjusted odds ratio (AOR) with a matching 95% confidence interval was used to determine the degree and direction of association for variables with p 0.05 in the final logistic model.

Permission and ethical considerations

Narjan University Hospital approved permission to collect data from health care workers.

RESULTS

The results of the study showed that participants spent different hours at work per day. The median number of working hours per day was 8 hours. Working hours per day ranged from 2 to 18 hours per day. Some of the study participants had night duty at work (n= 29, 34.5%). The median number of years at work was 8 years and ranged from 1

to 33 years.

Specialty varied among study participants. The most frequent specialty was doctors (n= 42, 50%) which reflects half of the study participants. Figure 2 represents the specialty among study participants.

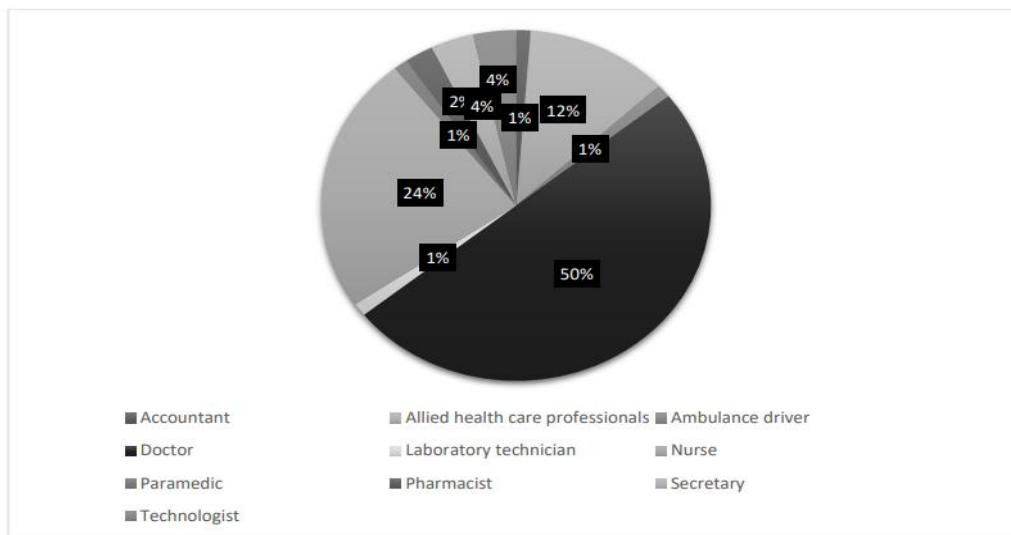


FIGURE 2: Specialty Distribution among Study Participants

Study participants reported many risk factors for low back pain. The most frequent risk factor was lack of exercise (n= 18, 21.4%). Some study participants reported having more than one risk factor for low back pain. Study participants frequently reported the following risk factors:

age above 45 years, body mass index more than 25, improper activity, arthritis, and the use of some medications such as glucocorticoids. 38 (45%) participants reported suffering from low back pain among study participants (Figure 3)

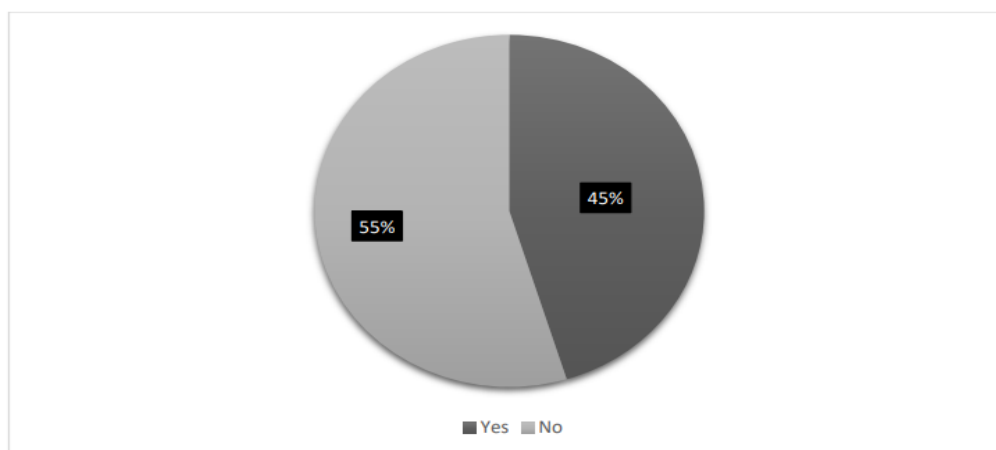


FIGURE 3: Participants Suffering from LBP

Participants who suffered from low back pain were further asked what they thought caused the LBP. Their answers varied according to the individuals. Some of the participants reported having a previous cesarean section, weight lifting, disc prolapse, and longtime of office work,

musculoskeletal problems, and many others.

Participants in this study assessed their low back pain using two scales. The first scale is Back Pain Functional Scale (BPFS). Their responses to scale items are presented in Table 1.

TABLE 1: Participants Responses to BPFS Items

| Item | Responses | | | | | | | Mean | SD |
|---|-----------|-----|-----|------|------|------|------|------|------|
| | 0 | 1 | 2 | 3 | 4 | 5 | | | |
| Usual work, house work, or school activities | F | 2 | 1 | 4 | 12 | 22 | 43 | 4.41 | 1.15 |
| | % | 2.4 | 1.2 | 4.8 | 14.3 | 26.2 | 51.2 | | |
| Usual hobbies, recreational, or sporting activities | F | 2 | 2 | 9 | 15 | 24 | 32 | 3.82 | 1.25 |
| | % | 2.4 | 2.4 | 10.7 | 17.9 | 28.6 | 38.1 | | |
| Performance of heavy activities around your home | F | 0 | 4 | 11 | 20 | 16 | 33 | 3.75 | 1.24 |
| | % | 0 | 4.8 | 13.1 | 23.8 | 19 | 39.3 | | |
| Bending or stooping | F | 2 | 4 | 10 | 8 | 20 | 40 | 3.9 | 1.36 |
| | % | 2.4 | 4.8 | 11.9 | 9.5 | 23.8 | 47.6 | | |
| Putting on your shoes or socks | F | 1 | 1 | 2 | 10 | 11 | 59 | 4.45 | 1.01 |
| | % | 1.2 | 1.2 | 2.4 | 11.9 | 13.1 | 70.2 | | |
| Lifting a box of groceries from the floor | F | 0 | 6 | 6 | 11 | 20 | 41 | 4 | 1.25 |
| | % | 0 | 7.1 | 7.1 | 13.1 | 23.8 | 48.8 | | |
| Sleeping | F | 0 | 1 | 5 | 7 | 19 | 52 | 4.39 | 0.95 |
| | % | 0 | 1.2 | 6 | 8.3 | 22.6 | 61.9 | | |

| | | | | | | | | | |
|--|---|-----|-----|-----|------|------|------|------|------|
| Standing for 1 hour | F | 0 | 7 | 7 | 16 | 20 | 34 | 3.8 | 1.28 |
| | % | 0 | 8.3 | 8.3 | 19 | 23.8 | 40.5 | | |
| Walking 1 mile | F | 1 | 3 | 6 | 13 | 22 | 39 | 4.01 | 1.19 |
| | % | 1.2 | 3.6 | 7.1 | 15.5 | 26.2 | 46.4 | | |
| Going up or down 2 flights of stairs (about 20 steps) | F | 0 | 3 | 7 | 15 | 16 | 43 | 4.06 | 1.16 |
| | % | 0 | 3.6 | 8.3 | 17.9 | 19 | 51.2 | | |
| Sitting for 1 hour | F | 0 | 3 | 4 | 15 | 23 | 39 | 4.08 | 1.07 |
| | % | 0 | 3.6 | 4.8 | 17.9 | 27.4 | 46.4 | | |
| Driving for 1 hour | F | 5 | 1 | 6 | 11 | 24 | 37 | 3.89 | 1.38 |
| | % | 6 | 1.2 | 7.1 | 13.1 | 28.6 | 44 | | |
| <p>BPFS: Back Pain Functional Scale; SD: Standard deviation; 0: Unable to perform activity;1: Extreme difficulty; 2: Quite a bit of difficulty; 3: Moderate difficulty; 4: A little bit of difficulty; 5: No difficulty</p> | | | | | | | | | |

The previous items have a maximum of 60 and a minimum of 0. The mean total among study participants was 48.3 ± 10.77 with a median of 51 out of 60. This reflects mild symptoms of LBP. For the previous total, night duty was significant for low BPFS low total ($P= 0.037$). Doctors were noted to have low BPFS total compared to other specialty ($P= 0.01$). Furthermore, participants who reported suffering from low back pain had lower BPFS total than others ($P= 0.001$).

Participants assessed their low back pain using other scale which was Oswestry Low Back Pain Scale as seen in Appendix 1. Their responses are given in detail in table 2. Participants who

suffered from low back pain were affected by their personal care more than others ($P= 0.013$). Older age groups were affected more regarding lifting than others ($P= 0.0001$). Doctors were also affected by lifting more than others ($P= 0.0001$). Participants with low back pain were also the same as doctors and old age groups ($P= 0.0001$). They also had difficulties walking more than others ($P= 0.001$). Furthermore, they had difficulties with setting more than others ($P= 0.0001$). Old age groups had trouble with sleeping more than youngsters ($P= 0.011$). Participants with low back pain had difficulties with sleeping, social life, and traveling ($P= 0.001, 0.016, 0.0001$, respectively).

TABLE 2: Participants Responses to Oswestry Low Back Pain Scale

| Item | Frequency | Percent |
|--|-----------|---------|
| Section 1 – Pain intensity | | |
| 1.1 | 50 | 59.5 |
| 1.2 | 25 | 29.8 |
| 1.3 | 6 | 7.1 |
| 1.4 | 2 | 2.4 |
| 1.5 | 0 | 0 |
| 1.6 | 1 | 1.2 |
| Section 2 – Personal care (washing, dressing etc) | | |
| 2.1 | 72 | 85.7 |
| 2.2 | 9 | 10.7 |
| 2.3 | 3 | 3.6 |
| 2.4 | 0 | 0 |
| 2.5 | 0 | 0 |
| 2.6 | 0 | 0 |
| Section 3 – Lifting | | |
| 3.1 | 43 | 51.2 |
| 3.2 | 30 | 35.7 |
| 3.3 | 7 | 8.3 |
| 3.4 | 1 | 1.2 |
| 3.5 | 3 | 3.6 |
| 3.6 | 0 | 0 |
| Section 4 – Walking | | |
| 4.1 | 64 | 76.2 |
| 4.2 | 14 | 16.7 |
| 4.3 | 4 | 4.8 |
| 4.5 | 0 | 0 |
| 4.6 | 2 | 2.4 |
| 4.7 | 0 | 0 |
| Section 5 – Sitting | | |
| 5.1 | 45 | 53.6 |
| 5.2 | 26 | 31 |
| 5.3 | 12 | 14.3 |
| 5.4 | 1 | 1.2 |
| 5.5 | 0 | 0 |
| 5.6 | 0 | 0 |
| Section 6 – Standing | | |
| 6.1 | 37 | 44 |
| 6.2 | 35 | 41.7 |
| 6.3 | 7 | 8.3 |
| 6.4 | 3 | 3.6 |
| 6.5 | 0 | 0 |
| 6.6 | 2 | 2.4 |
| Section 7 – Sleeping | | |
| 7.1 | 55 | 65.5 |
| 7.2 | 22 | 26.2 |
| 7.3 | 4 | 4.8 |
| 7.4 | 1 | 1.2 |
| 7.5 | 1 | 1.2 |
| 7.6 | 1 | 1.2 |

| Section 8 – Sex life (if applicable) (Missing = 14, 16.7%) | | |
|---|----------|------------|
| 8.1 | 58 | 69 |
| 8.2 | 10 | 11.9 |
| 8.3 | 0 | 0 |
| 8.4 | 1 | 1.2 |
| 8.5 | 1 | 1.2 |
| 8.6 | 0 | 0 |
| Section 9 – Social life | | |
| 9.1 | 59 | 70.2 |
| 9.2 | 21 | 25 |
| 9.3 | 3 | 3.6 |
| 9.4 | 1 | 1.2 |
| 9.5 | 0 | 0 |
| 9.6 | 0 | 0 |
| Section 10 – Travelling | | |
| 10.1 | 49 | 58.3 |
| 10.2 | 30 | 35.7 |
| 10.3 | 3 | 3.6 |
| 10.4 | 1 | 1.2 |
| 10.5 | 1 | 1.2 |
| 10.6 | 0 | 0 |

After adjusting for confounders in a multivariable logistic regression analysis, it was discovered that participants with low back pain were 4.325 times more likely to develop long-term low back pain and suffer than other participants were, regardless of their gender, night shift, or specialty (p value 0.05).

Moreover, 1.62 times likelihood of developing low back pain disease among participants who worked night shifts; 95% CI (1.05, 2.86). Table 3 shows the results of the multivariate linear logistic regression analysis.

TABLE 3: Multivariate Linear Logistic Regression Analysis

| Variable | | Multivariate linear logistic regression analysis | | |
|---------------------------|---------------|--|----------------------|-------------|
| | | Odds ratio | 95% CI | P- value |
| Gender | Male | 1 | 1 | - |
| | Female | 1.34 | 0.962 – 3.158 | 0.02 |
| Specialty | Doctors | 1.65 | 1.028 – 2.85 | 0.01 |
| | Nurses | 1.21 | 0.987 – 2.658 | 0.01 |
| Suffering from LBP | | 4.235 | 1.91 – 22.7 | 0.000 |
| Night duty | | 1.62 | 1.05 – 2.86 | 0.003 |

DISCUSSION

According to the current study, there were 45% of HCWs with LBP overall in Najran University Hospital (95% CI: 70.7-77.0). Studies suggest that the 1-year prevalence may provide a more accurate assessment of prevalence since the study participants' remembering bias is reduced (26). The prevalence of such conditions varies by nation. A frequency of 72 % was discovered in a

survey of nurses in Taiwan (27). (28)(29)In a Riyadh research, 65% of nurses reported LBP in the previous 12 months (10). These statistics show the extent of the LBP issue among HCWs both globally and locally.

Numerous studies (19, 21, 22, 24, 27) have demonstrated that HCWs are more likely to get LBP due to both personal and occupational

exposures. Due to differences in the findings of various investigations, it is challenging to make a firm assumption in this area. Additionally, variances in personal characteristics as well as variations in working conditions may contribute to the explanation of variations in LBP magnitude between regions and countries (28). Data on the personal and professional factors that are connected to LBP among HCWs at Najran University Hospital are provided by the current study.

The current study found a connection between LBP and the level of health care provided by HCWs (secondary and tertiary vs. primary). The risk that someone may develop LBP in secondary and tertiary care as opposed to primary care may depend on a variety of circumstances. These traits include demanding work situations and a substantial workload (27).

HCWs with a history of back injuries from overexertion, falling, or lifting large objects had a higher prevalence of LBP which shows that overexertion back trauma is more common among HCWs with long workdays and patient transfers (29) and is associated with a higher incidence of LBP (30).

There is an association between rising BMI and a higher incidence of LBP in HCWs. This outcome is in line with other studies that discovered a higher frequency of LBP in obese and overweight HCWs (31)(32)(31, 32). The results of a recent meta-analysis study revealed a strong correlation between BMI and LBP. (33). In comparison to people with a normal BMI, overweight and obese people had a higher one-year prevalence of LBP and a higher rate of seeking LBP treatment. Cross-sectional research made up the majority of the study. As a result, there may be a two-way relationship between obesity and LBP. The disorders of obesity and low back pain may coexist and have similar risk factors..

Numerous theories can be used to explain the link between low back pain and obesity disorders. Beginning with the lumbar spine, obesity can increase the mechanical load on the spine by putting more compressive stress on its components during various movements. Additionally, obese people are more prone to be engaged in vehicle accidents (34). Second, chronic inflammation brought on by obesity may contribute to LBP. Increased levels of cytokines and acute-phase reactants as well as the activation

of proinflammatory pathways are associated with obesity (35), which can lead to discomfort (33). In a meta-analysis research, obesity was found as a possibly modifiable risk factor for LBP (33).

The current study found that regular exercise had a substantial preventive impact against acquiring LBP in the previous 12 months and this aligns with previous research results which have yielded similar results (27, 36). This showcases that inadequate or non-existent back support and improper body mechanics come from a lack of regular physical activity (36).

A recent meta-analysis study found that engaging in moderate to vigorous physical activity while relaxing lowers the incidence of frequent or chronic LBP by 11–16% (37). The mechanisms behind exercise's ability to prevent persistent LBP are yet unclear. The benefits of better posture and muscle activation during exercise therapy for LBP may be enhanced however, there isn't enough evidence to prove that alterations in the musculoskeletal system cause the benefits of exercise on LBP (38). Given that LBP can encompass a number of psychological, social, lifestyle, and physical elements, there is presently considerable evidence that it is best understood from a biopsychosocial perspective (39).

The age range of 41 to 50 years old and extended working conditions were the only bivariate analysis findings that were significantly associated with LBP among HCWs. This age range corresponds to the period of a person's working life when they are the most prosperous (40). Other investigations in other occupational categories (1, 41) found a similar age pattern. Long-term working conditions have been linked to LBP in Taiwan during the past 12 months (27, 42), Egypt (42), and Turkey (36). Long-term standing may cause a variety of musculoskeletal consequences, including muscle ischemia, discomfort, and spinal disc degeneration (9). However, the lack of support provided by multivariate analysis for these two factors raises several questions regarding their reliability. The multivariable logistic regression's components are adjusted for one another, and the alpha level is held constant at 0.05. The outcomes of the multivariable analysis are therefore more likely to be precise and reliable than those obtained only from the bivariate analysis.

The study's flaws are mostly due to the fact that it is a cross-sectional exploratory study with a

chance of coincidental results. The fact that the study was restricted to a specific Saudi Arabian area is another drawback. A larger sample size that includes the other locations may be required in order to get results that are more comprehensive.

CONCLUSION

Healthcare staff at Najran University Hospital are susceptible to the common LBP illness. Their economy and health may suffer as a result of this problem. Working in higher levels of the medical field, suffering back injuries from overexertion, and not getting enough regular exercise are all possible risk factors for LBP.

By effectively reducing the physical workload and hiring more staff, the hospital can lessen the strain caused by this condition. Hospitals should create programs for occupational health and safety to offer ergonomically secure working conditions. Promoting regular physical exercise among HCWs will help to lower BMI and, as a result, the prevalence of LBP.

Funding

No funding was received for this article.

Competing interest

Authors declare no conflict of interest.

Permission and ethical considerations

Narjan University Hospital approved permission to collect data from health care workers.

REFERENCES

1. Walker BF. The prevalence of low back pain: a systematic review of the literature from 1966 to 1998. *Clinical Spine Surgery*. 2000;13(3):205-17.
2. Al-Arfaj AS, Al-Saleh SS, Alballa SR, Al-Dalaan AN, Bahabri SA, Al-Sekeit MA, et al. How common is back pain in Al-Qaseem region. *Saudi medical journal*. 2003;24(2):170-3.
3. Elnaggar RK, Elshazly FA, Elsayed WS, Ahmed AS. Determinants and relative risks of low back pain among the employees in Al-Kharj area, Saudi Arabia. *Eur J Sci Res*. 2015;135(3):299-308.
4. Stewart WF, Ricci JA, Chee E, Morganstein D, Lipton R. Lost productive time and cost due to common pain conditions in the US workforce. *Jama*. 2003;290(18):2443-54.
5. Al Dajah S, Al Daghdhi A. Prevalence and risk factors of low back pain among nurses in Sudayr region. *European Scientific Journal*. 2013;9(33).
6. Al Wassan K, Almas K, Al Shethri S, Al Qahtani M. Back & neck problems among dentists and dental auxiliaries. *J Contemp Dent Pract*. 2001;2(3):17-30.
7. Al-Eisa E, Al-Abbad H. Occupational back pain among rehabilitation nurses in Saudi Arabia: The influence of knowledge and awareness. *Workplace health & safety*. 2013;61(9):401-7.
8. Alghadir A, Zafar H, Iqbal ZA, Al-Eisa E. Work-related low back pain among physical therapists in Riyadh, Saudi Arabia. *Workplace health & safety*. 2017;65(8):337-45.
9. Valachi B, Valachi K. Mechanisms leading to musculoskeletal disorders in dentistry. *The Journal of the American Dental Association*. 2003;134(10):1344-50.
10. Abbas M, Zaid L, Fiala L, Alhamdan N. Prevalence and risk factors of low back pain among nurses in four tertiary care hospitals at King Fahad Medical City, Riyadh, KSA. *The Med J Cairo Univ*. 2010;78(2):219-23.
11. Abdul Monem A, Nizar A, Abdullaha A. Prevalence and associated factors of low back pain among clinicians of a major referral hospital. *Med J Malay*. 2015;70:12-7.
12. Alnefaie MN, Alamri AA, Hariri AF, Alsaad MS, Alsulami AM, Abbas AM, et al. Musculoskeletal symptoms among surgeons at a tertiary care center: a survey based study. *Medical Archives*. 2019;73(1):49.
13. Meisha DE, Alsharqawi NS, Samarah AA, Al-Ghamdi MY. Prevalence of work-related musculoskeletal disorders and ergonomic practice among dentists in Jeddah, Saudi Arabia. *Clinical, Cosmetic and Investigational Dentistry*. 2019;11:171.
14. Alzidani TH, Alturkistani AM, Alzahrani BS, Aljuhani AM, Alzahrani KM. Prevalence and risk factors of low back pain among Taif surgeons. *Prevalence*. 2018;7(3):172-7.
15. Aseri KS, Mulla AA, Alwaraq RM, Bahannan RJ. Characterizing Occupational Low Back Pain among Surgeons Working in Ministry of Health Hospitals in Jeddah City: Prevalence, Clinical Features, Risk, and Protective Factors. *Journal of King Abdulaziz University: Medical Sciences*. 2019;26(2).
16. Muaidi QI, Shanb AA. Prevalence causes and impact of work related musculoskeletal disorders among physical therapists. *Journal of back and musculoskeletal rehabilitation*. 2016;29(4):763-9.
17. Alnaami I, Awadalla NJ, Alkhairy M, Alburidy S, Alqarni A, Algarni A, et al. Prevalence and factors associated with low back pain among health care workers in southwestern Saudi

- Arabia. *BMC musculoskeletal disorders*. 2019;20(1):1-7.
18. Gouveia N, Rodrigues A, Ramiro S, Eusébio M, Machado PM, Canhao H, et al. The use of analgesic and other pain-relief drugs to manage chronic low back pain: results from a national survey. *Pain Practice*. 2017;17(3):353-65.
 19. Leijon O, Wiktorin C, Härenstam A, Karlqvist L. Validity of a self-administered questionnaire for assessing physical work loads in a general population. *Journal of occupational and environmental Medicine*. 2002;724-35.
 20. Holtermann A, Clausen T, Aust B, Mortensen OS, Andersen LL. Risk for low back pain from different frequencies, load mass and trunk postures of lifting and carrying among female healthcare workers. *International archives of occupational and environmental health*. 2013;86(4):463-70.
 21. Awaji M. Epidemiology of low back pain in Saudi Arabia. *J Adv Med Pharm Sci*. 2016;6(4):1-9.
 22. Behisi MA, Al-Otaibi ST, Beach J. Back pain among health care workers in a Saudi Aramco facility: Prevalence and associated factors. *Archives of Environmental & Occupational Health*. 2013;68(1):30-8.
 23. Dario AB, Ferreira ML, Refshauge KM, Lima TS, Ordoñana JR, Ferreira PH. The relationship between obesity, low back pain, and lumbar disc degeneration when genetics and the environment are considered: a systematic review of twin studies. *The spine journal*. 2015;15(5):1106-17.
 24. Johnson OE, Edward E. Prevalence and risk factors of low back pain among workers in a health facility in South-South Nigeria. *British Journal of Medicine and Medical Research*. 2016;11(8).
 25. Bin Homaid M, Abdelmoety D, Alshareef W, Alghamdi A, Alhozali F, Alfahmi N, et al. Prevalence and risk factors of low back pain among operation room staff at a Tertiary Care Center, Makkah, Saudi Arabia: a cross-sectional study. *Annals of occupational and environmental medicine*. 2016;28(1):1-8.
 26. Glover W. Work-related strain injuries in physiotherapists: prevalence and prevention of musculoskeletal disorders. *Physiotherapy*. 2002;88(6):364-72.
 27. Shieh S-H, Sung F-C, Su C-H, Tsai Y, Hsieh VC-R. Increased low back pain risk in nurses with high workload for patient care: A questionnaire survey. *Taiwanese Journal of Obstetrics and Gynecology*. 2016;55(4):525-9.
 28. Anderson SP, Oakman J. Allied health professionals and work-related musculoskeletal disorders: a systematic review. *Safety and health at work*. 2016;7(4):259-67.
 29. Engkvist I-L, Hjelm EW, Hagberg M, Menckel E, Ekenvall L. Risk indicators for reported over-exertion back injuries among female nursing personnel. *LWW*; 2000. p. 519-22.
 30. Hoy D, Bain C, Williams G, March L, Brooks P, Blyth F, et al. A systematic review of the global prevalence of low back pain. *Arthritis & Rheumatism*. 2012;64(6):2028-37.
 31. Jensen JN, Holtermann A, Clausen T, Mortensen OS, Carneiro IG, Andersen LL. The greatest risk for low-back pain among newly educated female health care workers; body weight or physical work load? *BMC Musculoskeletal disorders*. 2012;13(1):1-6.
 32. Mirtz TA, Greene L. Is obesity a risk factor for low back pain? An example of using the evidence to answer a clinical question. *Chiropractic & osteopathy*. 2005;13(1):1-6.
 33. Shiri R, Karppinen J, Leino-Arjas P, Solovieva S, Viikari-Juntura E. The association between obesity and low back pain: a meta-analysis. *American Journal of Epidemiology*. 2009;171(2):135-54.
 34. Hu H, Chou Y-J, Chou P, Chen L, Huang N. Association between obesity and injury among Taiwanese adults. *International journal of obesity*. 2009;33(8):878-84.
 35. Tilg H, Moschen AR. Adipocytokines: mediators linking adipose tissue, inflammation and immunity. *Nature Reviews Immunology*. 2006;6(10):772-83.
 36. Terzi R, Altın F. The prevalence of low back pain in hospital staff and its relationship with chronic fatigue syndrome and occupational factors. *Agri: Agri (Algoloji) Derneği'nin Yayın organidir= The journal of the Turkish Society of Algology*. 2015;27(3):149-54.
 37. Shiri R, Falah-Hassani K. Does leisure time physical activity protect against low back pain? Systematic review and meta-analysis of 36 prospective cohort studies. *British journal of sports medicine*. 2017;51(19):1410-8.
 38. Halliday MH, Pappas E, Hancock MJ, Clare HA, Pinto RZ, Robertson G, et al. A randomized controlled trial comparing the McKenzie method to motor control exercises in people with chronic low back pain and a directional preference. *Journal of Orthopaedic & Sports Physical Therapy*. 2016;46(7):514-22.
 39. Kamper SJ, Apeldoorn AT, Chiarotto A, Smeets RJ, Ostelo RW, Guzman J, et al. Multidisciplinary biopsychosocial rehabilitation for chronic low back pain: Cochrane systematic review and meta-analysis. *Bmj*. 2015;350.
 40. Maniadakis N, Gray A. The economic burden of back pain in the UK. *Pain*. 2000;84(1):95-103.
 41. Mehrdad R, Shams-Hosseini NS, Aghdaei S, Yousefian M. Prevalence of low back pain in healthcare workers and comparison with other occupational categories in Iran: a systematic review. *Iranian journal of medical sciences*. 2016;41(6):467.

42. Hegazy A, Awadalla N, Shenouda N. Prevalence of musculoskeletal complaints among dentists in some Egyptian cities. *Egyptian Journal of Occupational Medicine*. 2009;33(1):55-71.

Appendix 1

1. PAIN INTENSITY

I can tolerate the pain I have without having to use pain killers
The pain is bad but I manage without taking pain killers

Pain killers give complete relief from pain
Pain killers give moderate relief from pain
Pain killers give very little relief from pain

Pain killers have no effect on the pain and I do not use them

6. STANDING

I can stand as long as I want without extra pain
I can stand as long as I want but it gives me extra pain
Pain prevents me from standing for more than one hour
Pain prevents me from standing for more than 30 minutes
Pain prevents me from standing for more than 10 minutes
Pain prevents me from standing at all

2. PERSONAL CARE (e.g. Washing, Dressing)

I can look after myself normally without causing extra pain
I can look after myself normally but it causes extra pain

It is painful to look after myself and I am slow and careful
I need some help but manage most of my personal care

I need help every day in most aspects of self care
I don't get dressed, I was with difficulty and stay in bed

7. SLEEPING

Pain does not prevent me from sleeping well
I can sleep well only by using medication

Even when I take medication, I have less than 6 hrs sleep

Even when I take medication, I have less than 4 hrs sleep
Even when I take medication, I have less than 2 hrs sleep
Pain prevents me from sleeping at all

3. LIFTING

I can lift heavy weights without extra pain
I can lift heavy weights but it gives extra pain
Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, i.e. on a table
Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned

I can lift very light weights
I cannot lift or carry anything at all

8. SOCIAL LIFE

My social life is normal and gives me no extra pain

My social life is normal but increases the degree of pain

Pain has no significant effect on my social life apart from limiting my more energetic interests, i.e. dancing, etc.

Pain has restricted my social life and I do not go out as often
Pain has restricted my social life to my home

I have no social life because of pain

4. WALKING

Pain does not prevent me walking any distance

Pain prevents me walking more than one mile

Pain prevents me walking more than ½ mile

Pain prevents me walking more than ¼ mile

I can only walk using a stick or crutches

I am in bed most of the time and have to crawl to the toilet

9. TRAVELLING

I can travel anywhere without extra pain

I can travel anywhere but it gives me extra pain

Pain is bad, but I manage journeys over 2 hours

Pain restricts me to journeys of less than 1 hour

Pain restricts me to short necessary journeys under 30 minutes

Pain prevents me from traveling except to the doctor or hospital

5. SITTING

I can sit in any chair as long as I like

I can only sit in my favorite chair as long as I like

Pain prevents me from sitting more than one hour

Pain prevents me from sitting more than ½ hour

Pain prevents me from sitting more than 10 minutes

Pain prevents me from sitting at all

10. EMPLOYMENT/ HOMEMAKING

My normal homemaking/ job activities do not cause pain.

My normal homemaking/ job activities increase my pain, but I can still perform all that is required of me.

I can perform most of my homemaking/ job duties, but pain prevents me from performing more physically stressful activities (e.g. lifting, vacuuming)

Pain prevents me from doing anything but light duties.
Pain prevents me from doing even light duties.

Pain prevents me from performing any job or homemaking chores.