

The Prevalence of Low Back Pain and its Associated Factors among Primary-School Teachers in Jeddah - Saudi Arabia during 2018 - 2019

Osama Othman Alkudhair^{1*}, Sultan Khalaf Almasri¹, Abdulelah Abdullah Arzoun¹, Abdulaziz Maher Fadhel¹, Abdulrahman Ayoub Barqawi¹, Turki Khaled Bagaiafar¹, Mohammad Saleh Almarri², Ammar Yassir Bafarat³, Alanoud Saleh Albuloshi⁴ and Amro Yahya Khormi⁵

¹Medical intern, Umm AlQura university, Makkah, Saudi Arabia

²Assistant registrar, department of surgery, Aladan Hospital, Ministry of Health, Kuwait

³Medical intern, KSAU-HS, Jeddah, Saudi Arabia

⁴Medical intern, king Saud medical complex, Riyadh, Saudi Arabia

⁵Service Resident, Ministry of Health, Jazan, Saudi Arabia

***Corresponding Author:** Osama OthmanAlkudhair, Medical intern, Umm AlQura university, Makkah, Saudi Arabia.

Received: December 22, 2020; **Published:** December 31, 2020

Abstract

Background: Low Back Pain (LBP) is the pain localized between the costal margin and above the inferior gluteal folds. Most cases are nonspecific with no apparent cause. More than 80% of the world population will experience an episode of LBP at some point during their lives.

Objectives and Method: This descriptive cross-sectional study was aimed to identify the prevalence of LBP and its associated factors among 420 primary school teachers from 20 different public and private schools in Jeddah district in the period between November 2018 and May 2019. The study sample was chosen by multistage sampling method. Data was collected by a self-administered pre-tested questionnaire and recorded and analyzed using Statistical Package for Social Science (SPSS 20.0).

Results: The results of this study showed that the 12-month prevalence of LBP was about (52.6%). Female teachers with LBP were significantly higher than male teachers (57% and 41.3% respectively, $P = .004$). LBP was more common (58%) in the age group (30 - 40 years). LBP was significantly higher in overweight (62% 0.00), married teachers (56%, $P = 017$), among those who don't exercise (56%, $P = .002$), teachers who spent more than 10 years in teaching (60% $P = .018$) and teachers of public schools (57%, $P = .00$). LBP was significantly higher among teachers complaining from teaching-related physical activity (87%, $P = .000$), anxiety and other psycho-social stressors (49%, $P = .029$).

Conclusion and Recommendations: The LBP is a common health problem among primary-school teachers as this study highlights the need to increase the care of teachers' health and well-being from the government, media, and ministry of education.

Keywords: Low Back Pain; Prevalence; Association; Factors; Primary School Teachers

Introduction

The World Health Organization has defined the work related disorders as one that results from a number of factors, where the work environment and the performance of the work contribute significantly, but in varying magnitude, to the causation of the disease [1]. Musculoskeletal disorders are among the most common causes of long-term disability in the work area. They represent a group of diverse conditions that affect the bones, joints, and soft tissue structures around the joint. They also utilize a considerable proportion of healthcare

resources [2]. LBP is defined as non-specific low back pain that has lasted for more than 6 weeks, but for less than 12 months. The lower back is the area between the bottom of the rib cage and the buttock creases. Some people with non-specific low back pain may also feel pain in their upper legs, but the low back pain usually predominates [3]. Several structures in the back, including the joints, discs and connective tissues may contribute to symptoms [4]. The minority of LBP cases are due to specific causes such as trauma, infections, tumors, spondyloarthritis and metabolic disorders. Osteoporosis accounting for less than 20% of LBP cases, while most cases are non-specific with no apparent cause even with X-ray and different other investigations [5,6]. LBP is a major clinical and governmental health problem reaching epidemic proportions, and more than 80% of the world population will experience an episode of LBP at some time during their lives [7]. LBP is a multi-factorial disease with sex, age, occupation, physical factors and psychosocial factors are the main risk factors [8]. LBP was identified by the WHO as one of the top three occupational health problems and it has been estimated that around 37% of LBP burdens are from occupational exposures [9,10]. The following numbers will help clarifying the magnitude and the extent of LBP burden in the setting of school teachers. In Brazil and Malaysia, the prevalence of LBP among elementary school teachers were 41% and 43% respectively [11,12]. In Saudi Arabia, the prevalence of musculoskeletal pain disorders in teachers was 79.17% and the main site of pain was the low back (63.8%) [13]. A study done in Malaysia among primary school teachers revealed that the prevalence of LBP was higher among women (48.1%) than men (39.6%) [12]. A study conducted in Ethiopia stated that the majority of teachers (42.9%) suffering from LBP were in the age group of 40 - 59 years [14,15]. Obesity/overweight is one of the important risk factors, which causes an increase in the pressure on the structures of the lower back and that may lead -among other things- to lumbar disc herniation and subsequent LBP, different studies support that by reporting an association between being overweight and experiencing LBP [8,16]. Some studies have highlighted the role of smoking in LBP, as smoking can be a predisposing factor for LBP; these studies were conducted in Canada and Slovenia and showed that LBP prevalence is higher in smoking and ex-smoker population [17,18]. It had been observed that individuals who suffered from LBP problems might develop major physical, social and mental disruptions, which could affect their occupations. The psychosocial impacts of LBP are manifested through insomnia, irritability, anxiety and depression [16,19]. Almost half the teachers participating in a study in Ethiopia reported having some sort of a psychosocial complaint associated with their LBP [15]. Teachers often endure a marked load of teaching related physical activities, such as prolonged sitting of frequent reading and marking of assignments, prolonged standing up teaching in class and lifting heavy loads of books during their working hours, all of these teaching related physical factors makes teachers more susceptible to the development of LBP [20-22]. We found that many researches were conducted globally and regionally to evaluate LBP among the general population and teachers specifically, yet we could only few that addresses that issue among local teachers in Jeddah city.

Aim of the Study

The aim of this study is to determine the prevalence of LBP and its associated factors among primary school teachers in Jeddah district during 2018 - 2019.

Methodology

Study design and area: It is a descriptive cross-sectional study, conducted by group 1 of the 5th year medical students in primary schools (governmental and private) in Jeddah district during the period of November 2018 to May 2019.

Study population: All teachers (2539) in primary schools in Jeddah city in the study year (2018 - 2019). The sample size was calculated by the standard equation. Although the sample was increased by 10% to avoid the drop-out of teacher ($382 + 38.2 = 420.2 = 420$). The list of names of schools was obtained from the office of Director of General Education in the Ministry of Education in the district. The total number of teachers was 2539 teachers, distributed in 48 governmental and 27 private primary schools. The used sampling method in this research was multi-stage sampling. Stage 1 is choosing the schools where 20 schools "Appendix [I]" were chosen from the 75 schools randomly after arranging them by the gender of their teachers as: schools with male teachers and schools with female teachers. The sample

interval for schools was calculated as Sample interval = Total number of teachers (2539) divided by sample size (schools) (20) to be 127. A random number was chosen (14) which was considered for the first school. Then, the sample interval (127) was added to determine the next schools. Stage 2 is Choosing the teachers in which the number of teachers from each school was determined by; Proportion of teachers in each school equal to Number of teachers in each school x 100 divided by Number of teachers in all 20 schools. And Number of selected teachers from each school equal to Proportion of teachers in each school x sample size divided by 100. Teachers were chosen from each school by convenience sampling by selecting the available teachers in each school.

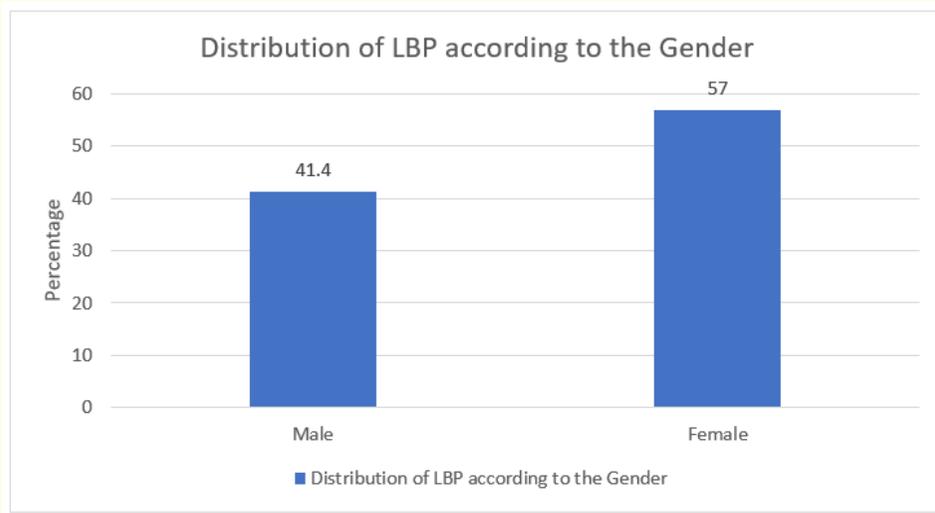
Data collection: Data was obtained by self-administered questionnaire which contained open and closed questions including: Personal data, type of school, years of teaching, teacher's habits (smoking - exercise), questions regarding LBP, physical activity, psychosocial stressors and work environment. Calculation of BMI was calculated for each participant where WHO criteria [23] used to determine the normal range is between 18.5 - 24.9, overweight is 25 and more and underweight is < 18.5. The pre-testing of questionnaire was conducted on 30 teachers chosen randomly according to the distribution of gender and type of schools among the sample population. The sample of teachers used in the pre-test was not included in the study.

Data processing and analysis: Obtained data was recorded in computer using Statistical Package for Social Science (SPSS 20.0), then analyzed by using descriptive Statistical tools (frequencies, percentage), Chi-square test was used to analyze the association between LBP and potential predictor variables. The mean and SD were also calculated for continuous variables. An approval letter was taken from dean's office to the education office of Jeddah district who gave us letters to schools' principles to facilitate giving the questionnaires to schools' teachers. We guaranteed the confidentiality of collected information.

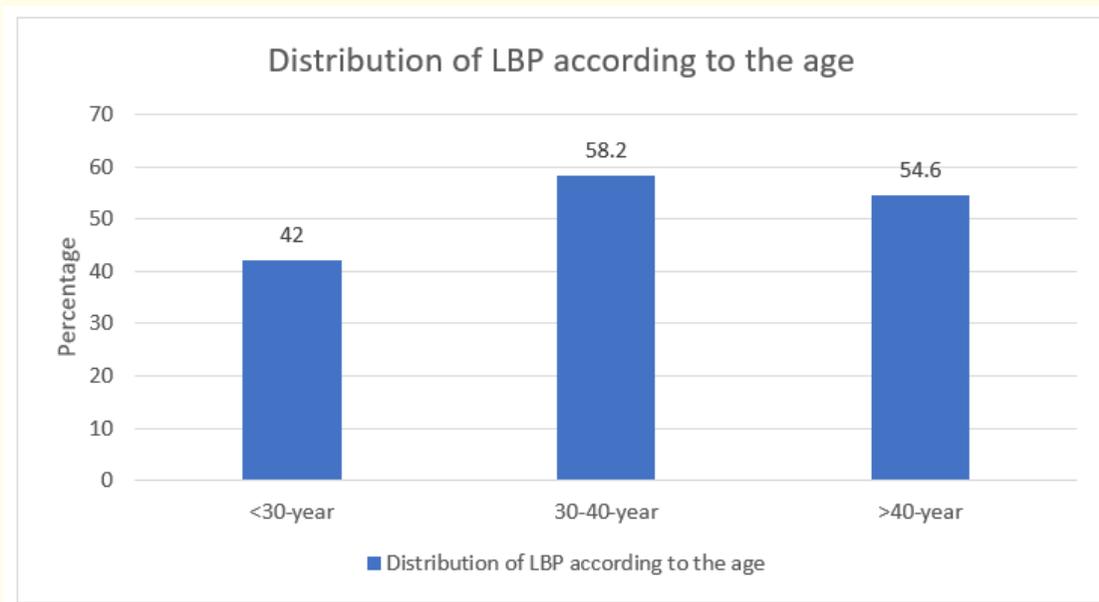
Results

All teachers (420) responded to the questionnaire, 304 (72.4%) were females and 116 were males (27.6%). Around 70% of teachers were married. Almost half of the teachers (43.3%) were in the age group of 30 - 40 years. The teachers' mean BMI was 24.9 (overweight) (SD = 10.3). About 54% of teachers were teaching for more than 10 years. About 75% of teachers worked in governmental schools, 25% in private schools and only one teacher worked in both schools. About 221 teachers (52.6%) reported that they have experienced LBP for at least one day during the last 12 months. Among those, 91 teachers (41%) said that they know the exact cause of their LBP and have consulted a doctor about it. Female teachers with LBP were significantly higher than male teachers (57% and 41.3% respectively, $P = .004$) (Graph 1). More teachers (58%) complained from LBP in the age group [30 - 40 years], comparing to (42% and 55%) in the age groups [< 30 years, > 40 years respectively], the result showing the significance of age in LBP ($P = .02$) (Graph 2). About 54% of teachers were overweight. BMI results showed significance ($P = .000$) between different body weights regarding LBP, 62% of overweight teachers had LBP, comparing with LPB in normal weight teachers (43%) (Graph 3). Married teachers who had LBP were significantly higher than single teachers (56% and 41% respectively, $P = .017$) (Table 1). LBP was significantly higher (59.5%) among both male and female teachers who had more than 3 children comparing to teachers with no children and teachers with 1-3 children [42% and 57% respectively, ($P = .009$)] (Graph 4). LBP was significantly higher in teachers who spent more than 10 years in teaching comparing to teachers who spent less than 10 years in teaching [60% and 40% respectively, ($P = .018$)]. Regarding the type of school, LBP was higher among teachers at governmental schools comparing to teachers in private schools (57% and 36% respectively, [$P = .000$]) (Table 2). The study showed that 95% of the teachers are non-smokers, there was no significance regarding LBP and smoking, as the percentage of smokers and ex-smoking teachers with LBP almost equals the percentage of non-smokers with LBP (47.4% and 52.9% respectively, [$P = .525$]). About 16% of teachers said they carry on regular sessions of exercise weekly. Among teachers who exercise, only 35.3% reported LBP, comparing to 56% among those who do not exercise, a result showing a high significance between exercise and the occurrence of LBP ($P = .002$). Regarding the teaching-related physical activities, teachers with LBP reported the following: 87% suffered from LBP after prolonged standing ($P = .000$), 73% after prolonged sitting ($P = .002$), 67% after using the stairs ($P = .002$), 39% after lifting loads ($P = .117$), 88% after sitting on uncomfortable chairs ($P = .000$). Regarding the psycho-social factors and the work environment, teachers with LBP reported the following: 42%

have sleeping disorder ($P = .001$), 49% experienced anxiety or stress ($P = .029$), 68% suffered from stressful duties related to school ($P = .106$), 51% are unsatisfied with their job situation ($P = 0.481$), 50% complained of lack of support from supervisors ($P = .685$) and only 9% had problems with colleagues ($P = .604$).



Graph 1: Association between LBP and gender among primary school teachers in Jeddah district during the period (2018 - 2019), $n = 221$.
N.B: Chi-square test $P = 0.004$ (there is statistical significance).



Graph 2: Association between LBP and different age groups among primary school teachers.
*Chi-square test $P = .02$ (there's statistical significance).

	Option	Low Back Pain				Total	
		Yes		No		Frequency	%
		Frequency	%	Frequency	%		
Marital status	Married	164	56%	129	44%	293	69.8%
	Single	43		62		105	
	Other	14	63.7%		36.3%	22	5.2%
Total		221	52.6%	199	47.4%	420	100%

Table 1: Association between LBP and marital status.

*Chi-square test $P = .017$ (statistical significance).

Option		Low Back Pain				Total	
		Yes		No		Frequency	Percentage
		Frequency	Percentage	Frequency	Percentage		
Type of school	Governmental	182	58%	132	42%	314	74.8%
	Private	38	36.2%	67	63.8%	105	25%
	Both	1	100%	0	0%	1	0.2%
Total		221	52.6%	199	47.4%	420	100%

Table 2: Association between LBP and the type of school.

Discussion

The prevalence of LBP in this study was 52.6%, which is almost similar to the prevalence among Ethiopian teachers (53.8%). The prevalence is less in Chinese and Malaysian teachers with 45.6% and 47.8% respectively, the lesser prevalence among Chinese and Malaysian teachers could be attributed to the fact that their sample contained less female teachers (67% for both studies) comparing to more female percentage in this study (72.4%), a fact that will be explained further in the next points in this discussion [12,15,24].

This study showed that 41% of teachers with LBP know the cause of their LBP; more Ethiopian teachers claimed they know the cause (60.5%) while the percentage is much lower in the WHO LBP initiative in 1999 which was 20%. The wide gap in the figures is probably due to the different sophisticated diagnosing tools in different countries, which will rule out most of the suspected causes of LBP and turn them into non-specific pain with no known cause [4,15]. This study showed that LBP is much more common in females comparing to males (57% and 41.3% respectively), the result is consistent with the Chinese study (51.7% vs. 42.7%), it's also consistent with a study conducted in Ethiopia (75.9%). Another study conducted in Saudi Arabia also found that female teachers complaining of LBP (63.8%) more than males. The higher LBP prevalence in females could be explained by the lower pain thresh holds comparing to males, it could be also due to more households shores that females usually do in those communities [13,15,24]. Our study showed that teachers at higher age groups suffered more from LBP ($P = 0.02$), this is consistent with the studies conducted in Ethiopia and China [15,24]. This study showed that BMI is a significant factor in LBP ($P = 0.000$), this result is also found in studies among Japanese, Malaysian, and Ethiopian teachers [15,22,25]. This study showed that being married will increase the probability of having LBP ($P = 0.009$) which is consisted with the researches conducted in Tunisian and Nigerian hospitals [26,27]. This study also showed that teachers with more children tend to suffer more LBP ($P = 0.009$), this result is supported by studies conducted among teachers in Brazil and Salvador [11]. This study showed that the increased number of teaching years is associated with increased LBP ($P = 0.018$), this result is similar to studies conducted in Brazil, China and another study done in Saudi Arabia. The type of school was significant too, as more teachers complained from LBP in

governmental schools, this could be due to the difference in job demand, school facilities and number of pupils between governmental and private schools, rendering the latter to be more relaxing and friendly environment [11,13,24]. This study showed no significance between smoking and LBP ($P = 0.525$), a result that contradicts the Tunisian, Ethiopian and Malaysian studies [15,22,26]. This could be due to the fact that the vast majority of this study's sample were females none of them smoke, comparing to 10 (8.6%) male teachers who smoke, this rationale is supported by a study conducted in Hadramout coastal districts during 2004-2005 among high school teachers showed the prevalence of smokers was 8% with no female smokers at all [28]. This study showed that exercise helps in reducing the chance of experiencing LBP ($P = 0.002$), this result was in line with a study conducted in Greece among physical education teachers. The possible explanation might be that shortened and weak muscles can cause LBP as they can cause misalignment of spine. Exercises can strengthen, lengthen, and make muscles of back strong to support and keep spine in perfect alignment for proper functioning [29]. Regarding the teaching-related physical activity and its association with LBP, this study showed a significant statistical role of prolonged standing, prolonged sitting, using the Stairs and sitting on uncomfortable chairs, all these results are supported by the studies among teachers in Malaysia, China and Ethiopia. The only non-significant teaching-related physical activity was lifting load, a result in line with the Ethiopian study but in contrast with the Malaysian study, the reason to that is probably the higher teaching physical demand in more developed countries [15,22,24]. Regarding the psycho-social factors, this study showed a significant statistical role of sleeping disorders, anxiety or stress in producing LBP. This result is supported by studies done in Malaysia and the WHO LBP Initiative [5,22]. Our study showed no significant LBP among teachers who suffered from stressful duties related to school ($P = 0.106$) result contradicts the Chinese study which was done on high school teachers, this might be due to the increased load of responsibilities at high schools comparing to primary schools [25]. This study showed no significant LBP among teachers who were unsatisfied with their job situation ($P = 0.481$), this results contradict a Japanese study, which stated that the more psychological demands needed for a certain task, the greater the possibility to develop musculoskeletal disorder [30]. This study also showed no significant LBP among teachers who complained from lack of support from supervisors ($P = 0.685$), in contrast to studies in Hong Kong and Japan, this could be due to the difference in norms and expectations among teachers from these countries [25,31]. Finally, this study showed no significant LBP among teachers who had problems with their colleagues ($P = 0.604$), a result in line with the Ethiopian study [15].

Conclusion

LBP is a common health problem among primary-school teachers in Jeddah district. Many individual characteristics proved to be significantly associated with increased risk of LBP, including female gender, old age, overweight BMI, being married and having children. Teachers who carry on regular sessions of exercise proved to have a significant lower chance in having LBP comparing to teachers who don't exercise. Many Teaching related factors proved to be significantly associated with increased risk of LBP, they were: teaching in governmental schools, spending more than a decade in the teaching profession, and enduring the agonizing teaching related physical activities. Some Psycho-social factors were significantly associated to LBP as sleeping disorders, anxiety and stress. The psychological effect of the work environment proved to have no statistically significant role in LBP.

Recommendations

There should be more care to the health and well-being of teachers from the government, media, and teachers' unions rather than focusing all the care on the economic aspects of teaching. Teachers must be oriented to the benefits of exercise as well as the damage a sedentary lifestyle could have on their weight and health in general. More researches should be conducted to further analyze the impact of work environments on teachers in all the divisions of the teaching process.

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Volume 13 Issue 1 January 2021

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