Work-Related Factors Associated with Low Back Pain (LBP) among Secondary and Primary schoolteachers in Jordan

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ABSTRACT

Background: LBP is a common disorder among schoolteachers; it is mainly associated with spent physical activities like standing or sitting postures and lifting.
Objective: The purposes of this study were to investigate the prevalence of and risk factors for low back pain (LBP) in teachers and to evaluate the association of individual and occupational characteristics with the prevalence of LBP. This study sought mainly to investigate the LBP prevalence among governmental secondary and primary schools teachers in Jordan.
Methods: the schoolteachers (4909) were randomly selected to respond on self-administrated questionnaire. SPSS was used to analyze the study results.
Results: The results indicated high rates of LBP among school teachers (92.3%). The prevalence of LBP among schoolteachers is associated to nature of workplace that requires physical activity. LBP is statically affected by the existence of back pain, age, weight, gender, pregnancy, Lifting loads , main body posture during work, and stage that the teacher teaches (Al-Zaqeba & AL-Rashdan, 2020a). The nature of the schoolteachers work oblige the teachers to long standing hours, as well to other physical activities like lifting, walking, and sitting. These physical activities may cause higher average of LBP. The result could be explained due to the lack of education given to the workers about the factors that cause LBP and the healthy postures. The results also indicated that higher LBP incidence among primary schoolteachers. This result is due to the amount of pressure in the primary schools. If the teachers do not maintain a normal posture in the workplace, they are vulnerable to higher LBP. The results indicated that LBP is associated with the working hours.

Keywords
Low Back Pain (LBP), Body Mass Index (BMI, LBP Associated Factors

Introduction

LBP is a musculoskeletal disorder that is common in all over the globe. It refers to a pain in the back bottom parts or the known as lumber back (Akter *et al.*, 2018). LBP is the second most common health problem among adults in the United States (Stewart *et al.*, 2003). According to Gaowgzeh (2019), LBP happens under the 12th rib and over the gluteal fold.

Scholars consider LBP among the burden diseases as the highest top ten (Rahman *et al.*, 2016). This disorder has negative impacts on the socioeconomic patterns of individuals. LBP has a negative impact on physical and social health. It usually affects the occupation of the individuals and their life quality (Kilborm et al., 1996).

LBP is a common disorder among the population of workers due to the physical activity they pay in their workplace especially nurses and dentists (Gaowgzeh, 2015). As well, LBP is common among teachers. Recent researches indicated that schools teachers are highly suffer from musculoskeletal pains, while LBP is most common among them (Erick and Smith, 2014). According to Yue et al (2012), there are various factors associated with LBP such as the standing posture and prolonged sitting. LBP is the most common musculoskeletal disorder; 70- 85% of the humans will suffer from LBP during their lives. The most effective technique to relief LBP is the reflexology technique (El-Gendy et al., 2015; Al-Zaqeba & AL-Rashdan, 2020).

The study of Alghwiri and Marchetti (2016) investigated the issue of upper back pain among the Jordanian schoolteachers, as well to estimate the disabilities reported due to work pressure. The study reported that modest and weighted spinal pain is common among schoolteachers. As well, the researchers collected the data based on the schoolteachers self-report, which revealed that various factors such affect heavily on the teachers productivity and contribute in expanding the back pains such as the teachers' gender, their geographic area, teaching level, and the school funds.

The study of Bandpei et al (2014) turned to study LBP among schoolteachers to estimate the risk factors that cause LBP and to evaluate the occupational risks. The study selected 586 teachers randomly from 22 schools in Iran city. The study relied on different questionnaires to collect the data from the study sample (Alaaraj et al., 2016; Alaaraj et al., 2016a; Al-Zaqeba et al., 2018). These tools collected data related to personal characteristics, occupational characteristics, intensity of the pain, disabilities, and LBP risk factors. The study found that 21.8%, 26.3%, 29.6%, 31.1%, and 36.5% were the rates of LBP rates distribution among the study sample within the last month, in the past 6 months, per year, and during the lifetime respectably. In conclusion, LBP is highly common among schools teachers in favor to primary schools teacher more than their counterparts in high schools are. Moreover, some factors significantly relate to the expansion of LBP among schools teachers such as the age, BMI, years of employment, their satisfaction about their jobs, and physical activities related to their work.

The study of Samad *et. al.* (2010) aimed at identifying LBP prevalence among primary schools teachers and the risk factors associated to their jobs. The study targeted nine of Klang Valley primary schools in Malaysia. The study relied on three questionnaires tool to collect data pertaining to occupational and demographic information, LBP prevalence, and the mental health. In conclusion, the LBP prevalence among the respondents was 40.4%, while the significant ranks of LBP causing factors were for lifting loads (28.0%) and prolonged sitting (25.2%). Finally, LBP has a significant negative impact to cause the risk of poor mental health (Alaaraj, 2018a; Alaaraj et al., 2018; Alaaraj et al., 2016b; Al-Zaqeba & AL-Rashdan, 2020).

The study of Akter *et al.* (2018) aimed to investigate the prevalence of LBP among schools teachers and the factors associated. The study sample was 145 schoolteachers from both genders in the age group (25-60) years old. The study results indicated that most of the study sample suffers from LBP. In addition, the results indicated that previous back injury, body mass index (BMI), and the distribution of sleeping were the main factors that cause LBP.

The study of Elias *et al.* (2019) aimed to identify the LBP prevalence among schoolteachers, LBP causing factors, and LBP associated physical disability. The researchers adopted self-administrated questionnaire to conduct this study in rural area of western Kenya randomly. The study results indicated that 64.98% of the teachers suffer from 12 months LBP, while 70% of the respondents suffer from minimal disability.

This study aims at investigating the prevalence of LBP among Jordanian schoolteachers and identifying the causing and associated factors.

Method

This cross sectional study relied on a questionnaire to collect data from June to October 2020. Four thousand nine hundred and nine (4909) teachers from both genders were randomly selected from primary schools, middle schools, and secondary schools in Jordan. The included teachers have at least one year of teaching experience. As well, the researcher excluded the teachers who suffer from back surgery history, disorders or fractures in the LB region, back tumor and/ or trauma.

Questionnaire

The researcher used a questionnaire to collect data pertaining to demographic data, occupational characteristics, LBP prevalence among the study sample, and work related factors related to LBP. The questionnaire includes socio-demographic data (gender, weight, years of experience, and marital status), pain intensity, personal care (washing, dressing, etc.), lifting, walking, sitting, standing, sleeping, social life, travelling, and the changing degree of pain.

Statistical Treatment:

The following statistical treatments through statistical software packages (SPSS) version 25 for data analysis were used:

- Frequencies and percentage for demographic information.
- Frequencies and percentage for work-related factors associated with lower back pain
- Cronbach-alpha was calculated to exctract Reliability coefficient of low back pain items
- Means and standard deviation for low back pain and total means of them (n= 4909)
- multiple regression analysis was applied to detect the most severe factors affecting lower back pain

The Sample of the Study

It was consisted of (4909) school teachers in Jordan, and they were randomly selected from the population of the study. Table (1) shows the sample distribution according to the personal variables.

Table (1) Frequency and percentage for the participants according to study variables (n=4909)

Variable	Category	Frequency	Percentage
Gender	Male	1409	28.7
	Female	3500	71.3
	Total	4909	100.0%
	20-30 years	249	5.1
	30 - 40 years	2105	42.9
	40 - 50 years	2197	44.8
	50 - 60 years	346	7.0
	More than 60 years	12	.2
	Total	4909	100.0%
Weight	60 – 70 kg	3667	74.7
	80 - 90 kg	828	16.9
	More than 90 kg	414	8.4
	Total	4909	100.0%
Years of experience	less than 15 years	2872	58.5
	15 - 20	1244	25.3
	More than 20	793	16.2
	Total	4909	100.0%
Marital status	Single	542	11.0
	Married	4367	89.0
	Total	4909	100.0%

Table (1) shows that:

- For Gender variable the highest percentage was (71.3%) for females, but the lowest percentage was (28.7%) for males.
- For Age variable the highest percentage was (44.8%) for “40 - 50 years”, but the lowest percentage was (0.2%) for “More than 60 years”.
- For Weight variable the highest percentage was (74.7%) for “60 - 70 kg”, but the lowest percentage was (8.4%) for “More than 90 kg”.
- For Years of experience variable, the highest percentage was (58.5%) for “less than 15 years”, but the lowest percentage was (16.2%) for “More than 20”.
- For Marital status variable the highest percentage was (89.0%) for “Married”, but the lowest percentage was (11.0%) for “single”.

The Results

This study is based on the quantitative (questionnaire) approach to achieve the objectives of this study which aims to identify work-related factors associated with lower back pain among school teachers in Jordan, the results were presented based on data analysis.

Descriptive Statistics:

Table (2): Means and standard deviation for low back pain (n= 4909)

No	Items	Mean	Standard Deviation	Rank
1	Pain Intensity	3.12	1.4	1
3	Lifting	2.55	1.52	2
10	Changing Degree of Pain	2.31	1.35	3
9	Traveling	2.14	1.43	4
6	Standing	2.08	1.25	5
4	Walking	1.97	1.44	6
8	Social Life	1.87	1.27	7
7	Sleeping	1.73	1.12	8
5	Sitting	1.59	1.33	9
2	Personal Care Washing Dressing	1.49	1.35	10
Total Work-Related Factors		2.09	0.95	

Table (2) shows that the highest means reached (3.12) for item No (1) "Pain Intensity", but the lowest means was (1.49) for item No (2) "Personal, Care, Washing, and Dressing", and means reached (2.09), for low back pain.

Work-Related Factors Associated with Low Back Pain

Q1: Suffer from back trouble?

To answer this question the frequencies and percentages were extracted, the below table shows this.

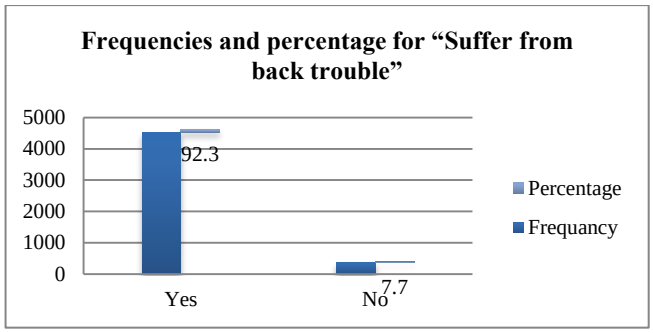


Fig. (1)Frequencies and percentage for "Suffer from back trouble"

Fig. (1) shows that the percentage for "Suffer from back trouble" highest reached (92.3%) for (Suffer from back trouble), but the lowest percentage was (7.7%) for (do not Suffer from back trouble).

Q2: What is your main body posture during work?

To answer this question the frequencies and percentages were extracted, the below Fig 2 shows this.

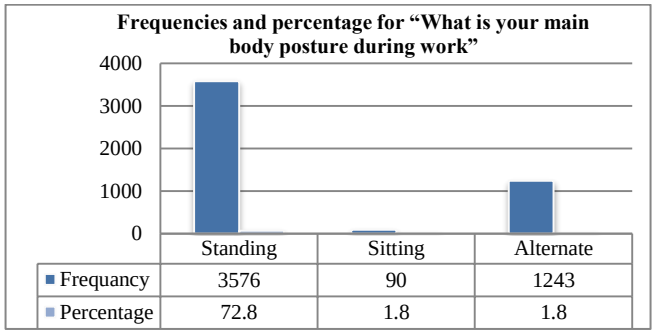


Fig (2). Frequencies and percentage for "What is your main body posture during work"

Fig. (2) shows that the percentage for "What is your main body posture during work" highest reached (72.8%) for (Standing), but the lowest percentage was (1.8%) for (Sitting).

Q3: Length of standing during teaching per day?

To answer this question the frequencies and percentages were extracted, the below figure shows this.

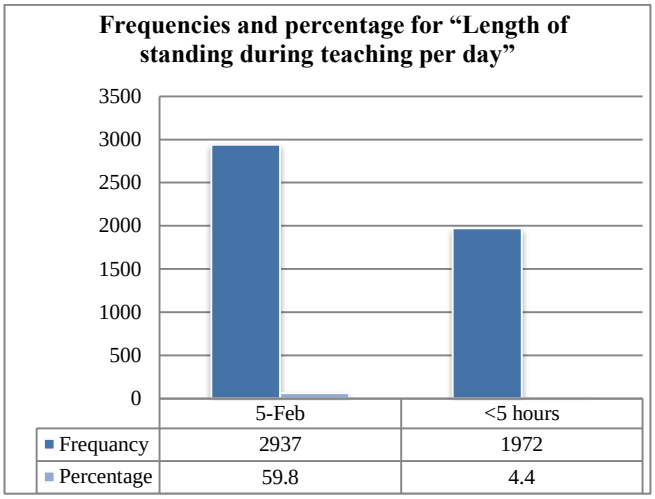


Fig. (3) Frequencies and percentage for "Length of standing during teaching per day"

Fig. (3) shows that the percentage for "Length of standing during teaching per day" highest reached (59.8%) for (2-5 Hours), but the lowest percentage was (40.2%) for (more than 5 Hours).

Q4: What stage are you teaching?

To answer this question the frequencies and percentages were extracted, the below figure shows this.

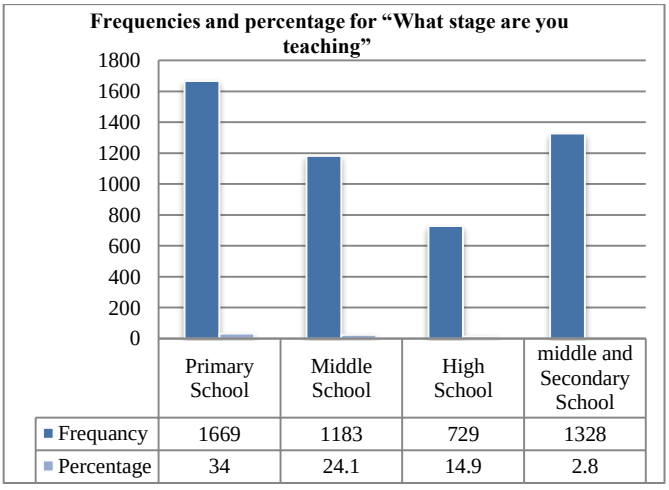
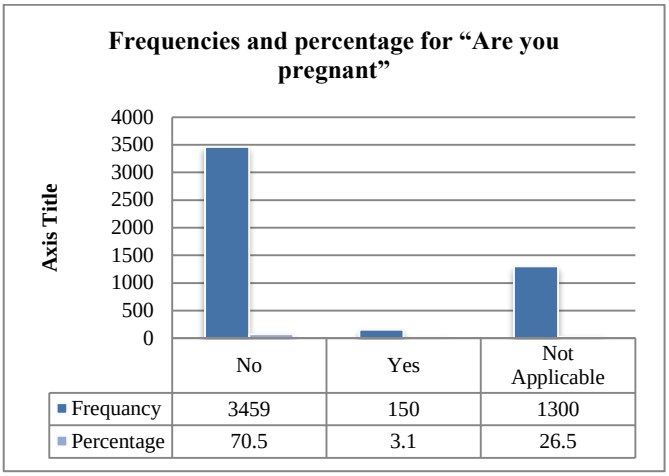


Figure (4) shows that the percentage for "What stage are you teaching" highest reached (34.0%) for (Primary school), but the lowest percentage was (14.9%) for (High school).

Q5: Are you pregnant?

To answer this question the frequencies and percentages were extracted, the below figure shows this.



Frequencies and percentage for "Are you pregnant"
Figure (5) shows that the percentage for "Are you pregnant" highest reached (34.0%) for (No), but the lowest percentage was (3.1%) for (Yes).

Q6: Are you smoker?
To answer this question the frequencies and percentages were extracted, the below table shows this.

Frequencies and percentage for "Are you smoker"

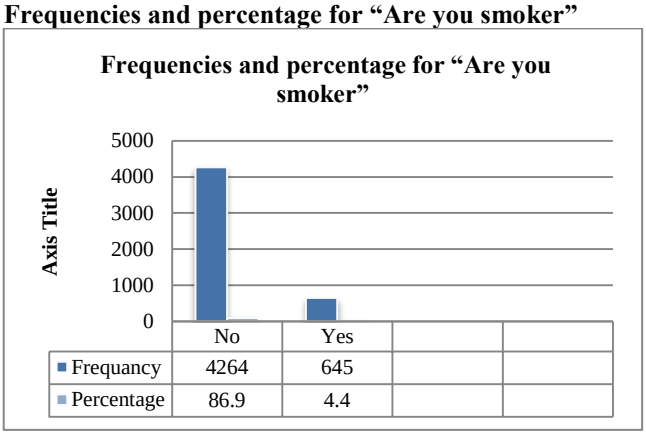


Fig. (6) shows that the percentage for "Are you smoker" highest reached (86.9%) for (No), but the lowest percentage was (13.1%) for (Yes).

Q7: What are the main work-related factors associated with low back pain among school teachers in Jordan?
To answer this question multiple regression analysis was applied to detect the most severe factors affecting lower back pain, table (9) shows that.

Table (9): The results of multiple regression analysis to detect the most severe factors affecting lower back pain (n= 4909)

Independent variables	value t	Sig. t	Beta	R	R^2	F value	Sig. F
Suffer from back trouble	**25.225**	**.000**	.332	.404	.163	106.322	.000
Age	**8.099**	**.000**	.109				
Weight	1.091	.275	.015				
Gender	**5.270**	**.000**	.109				
Are you married	1.323	.186	.018				
Are you pregnant	**-2.860**	**.004**	-.059				
Are you smoker	.490	.624	.007				
What is your main body posture during work	**-5.406**	**.000**	-.071				
What stage are you teaching	.334	.739	.004				

Dependent Variable: Total Low Back Pain

Table (9) shows the following:

- There is statistically significant effect at level (α≤0.05) to "Suffer from back trouble" factor, on lower back pain, where as (t) value was (25.225), by Sig. (.000).
- There is statistically significant effect at level (α≤0.05) to "Age" factor, on lower back pain, where as (t) value was (8.099), by Sig. (.000).
- There is no statistically significant effect at level (α≤0.05) to "Weight" factor, on lower back pain, where as (t) value was (1.091), by Sig. (.275).
- There is statistically significant effect at level (α≤0.05) to "Gender "factor, on lower back pain, where as (t) value was (5.270), by Sig. (.000).
- There is no statistically significant effect at level (α≤0.05) to "marital status" factor, on lower back pain, where as (t) value was (1.323), by Sig. (.186).
- There is statistically significant effect at level (α≤0.05) to "pregnancy" factor, on lower back pain, where as (t) value was (-2.860), by Sig. (.004).
- There is no statistically significant effect at level (α≤0.05) to "smoking" factor, on lower back pain, where as (t) value was (.490), by Sig. (.624).
- There is statistically significant effect at level (α≤0.05) to "main body posture during work" factor, on lower back pain, where as (t) value was (-5.406), by Sig. (.000).
- There is statistically significant effect at level (α≤0.05) to "stage that the teacher teaches" factor, on lower back pain, where as (t) value was .334), by Sig. (.739).
- There are statistically significant relationship between main work-related factors and total low back pain among school teachers in Jordan, R was (.404), by R^2 (16.3%).

Discussion

The results indicated high rates of LBP among school teachers (Erick & Smith, 2014). The prevalence of LBP among schoolteachers is associated to nature of workplace that requires physical activity (Gaowgzeh, 2015). LBP is statically affected by the existence of back pain, age, weight, gender, pregnancy, Lifting loads (Samad et. al, 2010), main body posture during work (Yue et al (2012), and stage that the teacher teaches . The nature of the schoolteachers work oblige the teachers to long standing hours, as well to other physical activities like lifting, walking, and sitting. These physical activities may cause higher average of LBP. The result could be explained due to the lack of education given to the workers about the factors that cause LBP and the healthy postures (Gaowgzeh, 2019). The results also indicated that higher LBP incidence among primary schoolteachers Bandpei et al (2014). This result is due to the

amount of pressure in the primary schools (Asaloej, 2020; (Al-Zaqeba et al., 2018; Al-Zaqeba & AL-Rashdan, 2020a). If the teachers do not maintain a normal posture in the workplace, they are vulnerable to higher LBP. The results indicated that LBP is associated with the working hours (Gaowgzeh, 2015). Therefore, there is a significant need to educate the schoolteachers about the risk factors that might cause LBP. The results indicated that most of the respondents suffer from back troubles (92.3%),which is a main factor for the prevalence of LBP among school teachers (Bandpei *et al*., 2014).

Conclusion and Recommendations

The study concludes that the workplace nature of the schoolteachers in Jordan have a high prevalence of LBP. Relaxation and doing exercises are the most important recommendations to reduce the risk related to schoolteachers work.

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