Journal of Health Informatics in Developing Countries

http://www.jhidc.org/
Vol. 11 No. 2, 2017

Submitted: Nov 19th, 2017 Accepted: December 16th, 2017

Impact of Low Back Pain on the work performance of male high school Saudi Teachers in Taif City

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Abstract

Background: Back pain is one of the commonly presenting complaint in the primary care. It recurrently affects people in their working years. Teachers in school represent an occupational group among which there seems to be a higher low back pain (LBP) prevalence.

Objectives: To determine the prevalence, associated risk factors and the burden of low back pain among high school Saudi teachers, Taif city, Saudi Arabia.

Methodology: A "cross-sectional study" was conducted including a randomly chosen representative sample of regular high school male Saudi teachers in Taif city during 2012-2013. Multi-stage sampling was adopted. A specially-designed Arabic questionnaire, consisting of seven sections including Anthropometric measurements (such as weight and height), BMI, teachers socio-demographic data, low back pain screening, risk factor analysis with low back pain, co-morbidity, including back problems, profession-related variables, and effect of low back pain on performance were used to collect the data. Statistical analysis was carried out using SPSS version 20.0.

Results: The study included 220 teachers. Their age ranged between 25 and 58 years with a mean of 39.5 years and a standard deviation of 6.9 years. The majority of them (88.7%) had a bachelor degree. The prevalence of LBP among them was 57.3%. Multivariate logistic regression analysis revealed that older (>45 years) teachers, obese teachers, those who were not regularly practicing physical exercises, those who had a history of lifting or pushing heavy weights, teachers who had history of direct trauma to the back and those who changed their fixed position at work were at a significantly higher risk for LBP. Significant absenteeism from work were reported among teachers with LBP. However, work grade was not affected due to LBP.

Conclusion: The LBP prevalence among high school teachers in Taif, Saudi Arabia is high as compared to the prevalence reported in other countries. It has a significant impact on the absence of school teachers from schools. Health promotion and educational programs together with adoption of public policies to improve the teacher's working conditions are warranted in future.

Keywords: Low back pain; Prevalence; orthopedic; teachers; Taif; Saudi Arabia.

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1. INTRODUCTION

Back pain is considered to be a common presenting complaint within the primary care centers which precisely impacts the people in their working years [1, 2]. Several studies have been conducted on back pain mainly emerging from different industrial countries [3]. Of these, most of the occupations are associated to some musculoskeletal disorders, such as "policeman's heel" or "deliveryman's back." For most of the pain disorders for instance, “carpal tunnel syndrome”, the association of this condition to some of the work patterns are well established. While, for other disorders, the association between the symptoms of patients and work environment, though evidently observed by the patient to be causative, might be less certain [4].

Various interventions were created for the purpose of supporting the medical management of LBP mainly related to work, by further preventing injuries and return to work early. Defining whether the LBP of a patient is a result of their occupational activities and how best a symptom can be treated to maximize the functionality in addition to return potential to full employment capacity can be quiet thought-provoking [5]. Universally, 37% of low back pain was found to occur due to a certain occupation, along with 2-fold variations through different regions. This ratio was more in men as compared to women, because of higher participation within labor force as well as in occupations with whole-body vibrations and heavy lifting. Work-related LBP was calculated to be a basis for 818,000 “disability-adjusted life years” lost per annum [6].

A population prevalence review regarding low back pain between 1966 and 1998 was undertaken to explore data appropriateness as well as homogeneity for pooling. “Point prevalence” ranged from 12% to 33%, whereas, 1 year prevalence ranged from 22% to 65% wherein, the lifetime prevalence ranged from 11% to 84% [7]. It has been also estimated that 70-85% of the USA population” gets affected by back pain at one point in time, with annual prevalence of 15 to 45% as well as a point prevalence of 30%. A high value for back pain prevalence was reported from Britain in 2 open surveys, mainly 10 years apart, showing an increase in the back pain prevalence with the passage of time (36.4% rising to 49.1%) [8, 9].

In the United States of America, back pain is one of the most common cause of activity limitation in individuals who were younger than 45 years old. It is also a 5th ranking cause of admissions in the hospitals [2, 3]. Low Back pain tends to have a critical impact on the functional capabilities of an individual, which ultimately restricts the occupational activities with a noticeable socioeconomic repercussions [10, 11]. Fortunately, the low back pain tends to solve the vast majority within 2 to 4 weeks [2]. Studies conducted previously on low back pain in the Kingdom of Saudi Arabia were carried out at a primary care facility, which investigated the relationship of LBP with obesity. This case control study used patients attending the primary care clinics in Riyadh, KSA as well as found back pain to be more common in obese individuals. However, in KSA, Al-Qaseem region, the prevalence of low back pain was estimated to be 18.8% [3].

The LBP is defined as a discomfort or pain, confined below the coastal margin and above the inferior gluteal folds either without or with leg pain [11-15]. Usually, the diagnosis of acute painful spinal situations are non-

specific such as back or neck strain, however, injuries might impact any of the other pain sensitive structure, which includes ligamentous support, spinal musculature, facet joints, and disk [16, 17]. Whereas, obesity was thought to be a LBP risk factor [3, 18]. Obesity is when BMI is =>30 kg/m2, and acceptable weight <25 – 18.5; overweight (BMI 25–29.9). Obesity was moderately associated with low back pain in UAE. Obesity in itself might have some influence on LBP due to poor lifestyle habit, and poor educational level [18]. In the Arabian population, the lack of exercise or lack of lifestyle habits in population may be additional factors contributing to the high prevalence rate of low back pain among them [18]. In general, low socio-economic status is associated with LBP [18, 19].

Smoking has been demonstrated to be a critical risk factor for LBP [20]. LBP is thought to be a largest cause of compensation of workers in Canada and USA [8, 9]. While, back pain is the second leading cause of sick leave. Around, 12.5% of all the sick days were associated with low back disorders in the United Kingdom. While, the figures for Sweden are similar with an estimated 13.5% of sick day, which is consequently, set to be a result of low back pain [21]. An economic back pain cost to society in Netherlands has been estimated to be 1.7% of the gross national product [22]. These were strong associations with occupational aspects. Long sitting, long standing, and heavy lifting were recognized caused for prevalence and incidence of LBP [23, 24]. Therefore, this habit of carrying heavy loads, long-term standing, psychosocial stressors, long-term repetitive physical activities, and awkward back postures should be reduced [24]. In a study, on LBP among Turkish teachers, the investigators found that depression is common and its presence reduces the quality of life for teachers [24]. Overall, 60.3% to 71.6% of teachers think that they had work-related pain due to work over load [20, 24]. With preventive strategies and education, the incidence and prevalence of LBP in teachers can be reduced. Of course, the teachers will play an important role in transferring the knowledge they gained to their students and family. To the knowledge of the researcher, there were no previous researches conducted to study the impact of low back pain on the performance among high school male teachers in Taif city. Therefore, this study will help to give an estimate of LBP prevalence and the association with performance and its burden, and will provide data and basis, as valid, for the development of educational programs in the future. This study was conducted to determine the impact of low back pain on the work performance of male high school Saudi teachers in Taif city, in Saudi Arabia.

2. METHODOLOGY

2.1 Study design and Settings

This is a descriptive cross sectional study. Taif city is located in the Mecca Province of Saudi Arabia at an elevation of 1,879 m (6,165 ft) on the Sarawat Mountains slopes (Al-Sarawat Mountains). It has a population of 883,538 (2010 CDSI) [25]. This city is the center of an agricultural area well known for its roses, grapes, and honey. Taif region is considered to be the third educational region in Saudi Arabia with respect to the number of schools and students after Riyadh and Makkah regions. It has 608 schools, 5215 classrooms, 103,879 students, and

10,067 school teachers of which, 1722 male high school teachers', and Saudi teachers are 1645. At the region of Taif, there are 99 secondary schools for males [26, 27].

2.2 Study population and Selection Criteria

The study population consists of regular high school male teachers in Taif city during 2012-2013. The estimated number of eligible regular male teachers are 1244 [26, 27]. All Saudi teachers in male high schools in Taif city, Saudi Arabia during 2012 – 2013 were included. However, non-Saudi teachers and those with non-teaching activities were excluded.

2.3 Sample size

Using EPI info version 7 (stat calc – epi calculator), sample size of 197 teachers was estimated from approximately 1244 male high school teachers in Taif city [26, 27]. Overall, 18.8 present expected prevalence of low back pain, allowing an error of 5% and 95% level confidence [3]. It's believed that a sample size of about 220 school teachers (197 teachers and 10% increase in the number to compensate for drop rate) is adequate to achieve degree of precision in estimating the true prevalence across the population.

2.4 Sampling techniques

Multi-stage sampling was adopted. Teachers from different schools were selected using cluster sampling technique (all teachers in the selected school were included).Taif city was divided into four sectors by the ministry of education (east, west, north, and south), with a rate of 17.14 teachers in each high school [26]. From each sector, 3 male secondary schools were nominated by means of a simple random technique, a total of twelve schools were randomly selected in four sectors. In each randomly selected school, all teachers were included. We started the research by taking teacher`s measurement and then distributing the questionnaire.

2.5 Data Collection Method

Self-administered questionnaire were given to all participants. A specially-designed Arabic questionnaire was used. It consisted of seven sections. A specially-designed Arabic questionnaire, consisting of seven sections including Anthropometric measurements (such as weight and height), BMI, teachers socio-demographic data, low back pain screening, risk factor analysis with low back pain, co-morbidity, including back problems, profession-related variables, and effect of low back pain on performance were used to collect the data. BMI or Body mass index was calculated by dividing the weight in kg of a person by square of the length in meters. Individuals were categorized, as per the values of BMI into four subgroups; normal (BMI from 18.5 to 24.9 kg/m2), overweight (BMI from 25 to 29.9 kg/m2), Obese class I (BMI from 30 to 34.9 kg/m2), Obese class II (BMI from 35 to 39.9 kg/m2), and obese class III (BMI $\geq$ 40 kg/m2).

2.6 Questionnaire Validity

The questionnaire was reviewed for face validity by two family medicine and two community medicine consultants. Furthermore, a pilot study was performed among all teachers from one randomly selected school. The pilot study helped in testing the understanding of the teachers with respect to the questionnaires and modifying it accordingly, by means of choosing the pertinent variables which are appropriate for the statistical approaches to be utilized, investigating the time required to answer any specific questionnaire and take the measurements that may provide an actual condition within a study. Furthermore, variations were undertaken based on the pilot testing.

2.7 Ethical Considerations

This study was approved by "Regional Research and Ethics team" in Taif Armed Hospitals. Permissions from several different authorities responsible for schools in the city of Taif was also processed. A verbal consent was taken from all participants so as to take part voluntarily in the study. Whereas, the data was treated confidentially and was only utilized for the research purpose.

2.8 Data Analysis

The SPSS version was used for the data analysis and entry. Analytic statistics and descriptive statistics (range for continuous variables, standard deviation, percentage for mean and categorical variables, and number) used Chi Square tests ($\chi 2$) for testing the difference and associations between the two categories of variables applied. P-value either equal to or may be less than 0.05 was taken to be as statistically significant. Low back pain history was treated as dependent variables in bivariate and "univariate logistic regression analysis" model. Certain variables related to depression in bivariate analysis were treated as "independent categorical variables". Diverse associations were examined in the multiple logistic regression models mainly established on the stepwise backward selection. This technique help in estimating the strength of association between all the independent variables while allowing for the potential confounding effects on the other independent variables. Hence, any insignificant covariates were considerably removed from this model. While, every class of the predictor variables were contrasted with the reference or primary categories. The adjusted and crude measures of association between depression and determinant factors were articulated as the odds ratio (OR) with 95% Confidence Interval (95% CI).

3. RESULTS

3.1 Socio-demographic characteristics

The study included 220 teachers. Table 1 demonstrates the socio-demographic characteristics of the respondents. The age of the participants ranged between 25 and 58 years with a mean of 39.5 years and standard deviation of 6.9 years. The majority of them (88.7%) had bachelor's degree while only 8.6% had master degree. The income ranged between 10000 and <15000 among 40.4% and between 15000 and <20000 among 30.9%. More

than half of them (53.2%) had rented homes. Most of them were married (80.5%). More than half of them (53.2%) had 1-3 children aged less than 18 years old, while 25.5% had 1-3 children over 18 years.

Table 1: Socio-demographic characteristics of male teachers, Taif

Variable	Frequency	Percentage
Age (years)		
25-35	66	30.0
36-45	109	49.5
>45	45	20.5
Educational level		
Diploma	6	2.7
Bachelor	195	88.7
Master	19	8.6
Income (SR/month)		
<5000	16	7.3
5000-<10000	44	20.0
10000-<15000	89	40.4
15000-<20000	68	30.9
>20000	3	1.4
Housing		
Rent	117	53.2
Private	103	46.8
Marital status		
Single	26	11.8
Married (one wife)	159	72.3
Married (> one wife)	18	8.2
Divorced	11	5.0
Widowed	6	2.7
Number of children		
<18 years		
None	46	20.9
1-3	117	53.2
>3	57	25.9
>18 years		
None	154	7.0
1-3	56	25.5
>3	10	4.5

From Table 2, it is evident that more than half (57.3%) of the male school teachers in Taif reported a history of low back pain. Of those who reported LBP (n=126), 111 teachers (88.1%) reported LBP during the current scholastic year.

Table 2: Prevalence of low back pain among the studied sample

Variable	Frequency	Percentage
History of low back pain		
Yes	126	57.3%
No	94	42.7%
Low back pain during the scholastic year		
Yes	111	88.1 %
No	15	11.9 %
Low back pain reported		
Most Of Days	-	30.2%
Daily	-	7.9%
Monthly	-	26.2%
Weekly	-	13.5%
Every 3 months	-	8.7%
Every 6 months	-	8.7%
Once	-	4.8 %
Duration of low back pain		
<4 Weeks	103	81.7%
4-12 Weeks	11	8.7%
>12 Weeks	12	9.5%

Need of physician`s visit		
Yes	67	53.2%
No	59	46.8%
Need of hospital admissions		
Yes	13	10.3%
No	113	89.7%
Need of surgery		
Yes	4	3.2%
No	122	96.8%
Analgesics use		
Yes	84	66.7%
No	42	33.3%
Frequency of Analgesics		
Daily	-	11.1%
Monthly	-	9.5%
Weekly	-	23.9%
Every 3 months	-	15.9%
Every 6 months	-	6.3%
Never	-	33.3%

Among male teachers who reported LBP, 30.2% reported it most of days while 7.9% reported it daily. More than one-quarter of them (26.2%) reported LBP monthly and 13.5% reported it weekly. The majority (81.7%) of male teachers who had LBP reported a duration of less than 4 weeks while 9.5% of them reported a duration of more than 12 weeks for LBP. More than half of the male teachers who had LBP needed physician`s visits because of that pain. Thirteen teachers (10.3%) needed hospital admission due to low back pain. Only 4 teachers who had LBP (3.2%) needed surgical intervention because of LBP. Exactly two thirds (66.7%) of the male teachers who reported LBP used analgesics for it. Daily use of analgesics was mentioned by 11.1% of teachers with LBP while weekly or monthly use were reported by 9.5% and 23.9% of them, respectively.

3.2 Risk factors for low back pain

3.2.1 Socio-demographic factors

Considering teachers in the age group 25-35 years as a reference category, those aged 36-45 and over 45 years were at a higher risk for LBP (OR=1.96, 95% CI:1.05-3.64 and OR=2.83, 95% CI:1.27-6.27, respectively). Teachers with income ranged between 10000 and 150000 SR/month were at almost five folded risk of LBP opposed to those with low income (<5000 SR/month) (OR=4.78, 95% CI:1.56-14.63). Married teachers were at almost double-folded risk for LBP compared to singles (OR=2.31, 95% CI:1.01-5.42) while divorced teachers were at almost four-folded risk for LBP opposed to singles (OR=3.84, 95% CI:1.04-14.21). Teacher`s educational level, housing and number of children were not a significant potential risk factors for LBP (Table 3).

Table 3: Socio-demographic risk factors for low back pain among male teachers, Taif.

Socio-demographic factors	Low back pain		Crude Odds ratio	95% Confidence intervals
	No N (%)	Yes N (%)		
Age (years)				
25-35 ® (n=66)	37 (56.1)	29 (43.9)	1.0	
36-45 (n=109)	43 (39.4)	66 (60.6)	1.96	1.05-3.64*
>45 (n=45)	14 (31.1)	31 (68.9)	2.83	1.27-6.27*
Educational level				
Diploma ® (n=6)	2 (33.3)	4 (66.7)	1.0	
Bachelor (n=195)	85 (43.6)	110 (56.4)	0.65	0.12-3.62
Master (n=19)	7 (36.8)	12 (63.2)	0.86	0.12-5.94
Income (SR/month)				
<5000 ® (n=16)	10 (62.5)	6 (37.5)	1.0	
5000-<10000 (n=44)	29 (65.9)	15 (34.1)	0.86	0.26-2.83
10000-<15000 (n=89)	23 (25.8)	66 (74.2)	4.78	1.56-14.63*
>15000 (n=71)	32 (45.1)	39 (54.9)	2.03	0.67-6.19
Housing				
Rent ® (n=117	52 (44.4)	65 (55.6)	1.0	
Private (n=103)	42 (40.8)	61 (59.2)	1.16	0.68-1.99
Marital status				
Single ® (n=26)	16 (61.5)	10 (38.5)	1.0	
Married (1 wife) (n=159)	65 (40.9)	94 (59.1)	2.31	1.01-5.42*
Married (> 1wife) (n=18)	8 (44.4)	10 (55.6)	2.0	0.59-6.78
Divorced/widow (n=17)	5 (29.4)	12 (70.6)	3.84	1.04-14.21*
Number of children				
<18 years				
None ® (n=46)	22 (47.8)	24 (52.2)	1.0	
1-3 (n=117)	51 (43.6)	66 (56.4)	1.19	0.60-2.35
>3 (n=57)	21 (36.8)	36 (63.2)	1.57	0.71-3.46
>18 years				
None ® (n=154)	68 (44.2)	86 (55.8)	1.0	
1-3 (n=56)	21 (37.5)	35 (62.5)	1.32	0.70-2.47
>3 (n=10)	5 (50.0)	5 (50.0)	0.79	0.22-2.84

®: Reference category * p<0.05

3.2.2 Job-related factors

Compared to teachers with experience ranged between 1 and 4 years, those with longer experience (10-14 years) and (15-19 years) were at higher risk for LBP (OR=2.85, 95% CI:1.19-6.85 and OR=4.48, 95% CI:1.98-10.13, respectively).Teachers who changed their fixed position at work were at almost 7-folded risk of LBP as opposed to those who had no fixed position at work (OR=6.81, 95% CI:3.43-13.51). Other job-related factors of teachers such as speciality, number of classes/week, number of standing hours, long sitting, number of sitting hours, number of driving hours, and computer use hours were not significantly potential risk factors for LBP (Table 4).

Table 4: Job-related risk factors for low back pain among male teachers, Taif.

Job-related factors	Low back pain		Crude Odds ratio	95% Confidence intervals
	No N=94 N (%)	Yes N=126 N (%)		
Specialty				
Islamic subjects ® (n=29)	16 (55.2)	13 (44.8)	1.0	
Arabic (n=35)	15 (42.9)	20 (57.1)	1.64	0.61-4.42
English (n=25)	9 (36.0)	16 (64.0)	2.19	0.73-6.55
Science (n=81)	31 (38.3)	50 (61.7)	1.99	0.84-4.68
Social subjects (n=21)	6 (28.6)	15 (71.4)	3.08	0.93-10.18
Computer sciences (n=19)	9 (47.4)	10 (52.6)	1.37	0.43-4.36
Physical education (n=10)	8 (80.0)	2 (20.0)	0.31	0.06-1.71
Number of classes/week				
<10 ® (n=23)	9 (39.1)	14 (60.9)	1.0	
10-14 (n=52)	29 (55.8)	23 (44.2)	0.51	0.19-1.39
15-19 (n=117)	44 (37.6)	73 (62.4)	1.07	0.43-2.67
≥20 (n=28)	12 (42.9)	16 (57.1)	0.86	0.28-2.64
Experience (years)				
1-4® (n=43)	28 (65.1)	15 (34.9)	1.0	
5-9 (n=35)	16 (45.7)	19 (54.3)	2.22	0.89-5.53
10-14 (n=43)	17 (39.5)	26 (60.5)	2.85	1.19-6.85*
15-19 (n=68)	20 (29.4)	48 (70.6)	4.48	1.98-10.13*
≥20 (n=31)	13 (41.9)	18 (58.1)	2.58	1.0-6.68
Average number of standing hours/week				
≤7® (n=203)				
>7 (n=15)	89 (43.8)	114 (56.2)	1.0	
	5 (33.3)	10 (66.7)	1.56	0.52-4.73
Long sitting during work				
No® (n=179)	82 (45.8)	97 (54.2)	1.0	
Yes (n=41)	12 (29.3)	29 (70.7)	2.04	0.98-4.26
Average number of sitting hours/day				
≤7® (n=191)				
>7 (n=23)	85 (44.5)	106 (55.5)	1.0	
	7 (30.4)	16 (69.6)	1.83	0.72-4.66
Average number of driving hours/day				
≤3® (n=176)				
>3 (n=28**)**	76 (43.2)	100 (56.8)	1.0	
	9 (32.1)	19 (67.9)	1.60	0.69-3.74
Average number of computer hours/day				
≤3® (n=160)				
>3 (n=46)	69 (43.1)	91 (56.9)	1.0	
	22 (47.8)	24 (52.2)	0.83	0.43-1.60
Fixed position at work				
No ® (n=137)	79 (57.7)	58 (42.3)	1.0	
Yes (n=78)	13 (16.7)	65 (83.3)	6.81	3.43-13.51*

®: Reference category * p<0.05

3.2.3 Body mass Index

Teachers with obesity classes 2 or 3 based on BMI were at a higher risk for LBP compared to those with normal BMI (OR=21.27, 95% CI:2.62-172.37). Over weighted and obese class 1 teachers were not significantly potential risk factors for LBP (Table 5).

Table 5: Body mass index as a risk factor for low back pain among male teachers, Taif.

BMI	Low back pain		Crude Odds ratio	95% Confidence intervals
	No N (%)	Yes N (%)		
Normal ® (n=48)	26 (54.2)	22(45.8)	1.0	
Overweight (n=112)	50 (44.6)	62 (55.4)	1.47	0.74-2.89
Obesity class 1 (n=39)	15 (38.5)	24 (61.5)	1.89	0.80-4.47
Obesity class 2/3 (n=19)	1 (5.3)	18 (94.7)	21.27	2.62-172.37*

®: Reference category * p<0.05

3.2.4 Smoking

As shown in table 6, history of smoking or its duration were not potential risk factors for LBP among male teachers.

Table 6: Smoking as a risk factor for low back pain among male teachers, Taif.

Smoking	Low back pain		Crude Odds ratio	95% Confidence intervals
	No N (%)	Yes N (%)		
Smoking history				
No ® (n=127)	50 (39.4)	77 (60.6)	1.0	
Yes (n=54)	23 (42.6)	31 (57.4)	0.88	0.46-1.67
Ex-smoker (n=39)	21 (53.8)	18 (46.2)	0.56	0.27-1.15
Smoking duration				
No ® (n=127)	50 (39.4)	77 (60.6)	1.0	
≤10 years (n=63)	36 (57.1)	27 (42.9)	0.48	0.26-0.90
>10 years (n=30)	8 (26.7)	22 (73.3)	1.79	0.74-4.32

®: Reference category

3.2.5 Medical History

Hypertensive teachers were at almost double the risk for LBP compared to normotensives (OR=2.40, 95% CI:1.10-5.23). Other medical problems (psychiatric problems, diabetes mellitus, bronchial asthma, brucellosis, rheumatic diseases, edocrinal diseases, using sedatives/hypnotics or using steroids) were not potential risk factors for LBP among male teachers.

Table 7: Medical history as a risk factor for low back pain among male teachers, Taif.

Medical history	Low back pain		Crude Odds ratio	95% Confidence intervals
	No N=94 N (%)	Yes N=126 N (%)		
Psychiatric problems				
No ® (n=195)	81 (41.5)	114 (58.5)	1.0	
Yes (n=25)	13 (52.0)	12 (48.0)	0.66	0.29-1.51
Diabetes mellitus				
No ® (n=199)	87 (43.7)	112 (56.3)	1.0	
Yes (n=21)	7 (33.3)	14 (66.7)	1.55	0.60-4.02
Hypertension				
No ® (n=182)	84 (46.2)	98 (53.8)	1.0	
Yes (n=38)	10 (26.3)	28 (73.7)	2.40	1.10-5.23*
Bronchial asthma				
No ® (n=195)	85 (43.6)	110 (56.4)	1.0	
Yes (n=25)	9 (36.0)	16 (64.0)	1.37	0.58-3.26
Brucellosis				
No ® (n=216)	94 (43.5)	122 (56.5)	1.0	
Yes (n=4)	0 (0)	4 (100)	NA	----------
Rheumatic diseases				
No ® (n=201)	90 (44.8)	111 (55.2)	1.0	
Yes (n=19)	4 (21.1)	15 (78.9)	3.04	0.98-9.48
Endocrinal diseases				
No ® (n=209)	89 (42.6)	120 (57.4)	1.0	
Yes (n=11)	5 (45.5)	6 (54.5)	0.89	0.26-3.01
Using sedatives/hypnotics				
No ® (n=197)	86 (43.7)	111 (56.3)	1.0	
Yes (n=23)	5 (34.8)	6 (65.2)	1.45	0.59-3.58
Using steroids				
No ® (n=204)	91 (44.6)	113 (55.4)	1.0	
Yes (n=16)	3 (18.8)	13 (81.2)	3.49	0.97-12.62

®: Reference category * p<0.05

3.2.6 Life style

Regular exercise: Compared to teachers who regularly practice exercise, those who did not practice exercise regularly were at significant higher risk for LBP (OR=8.15, 95% CI:4.20-15.83).

Lifting heavy weight: Teachers who had a history of lifting heavy objects were at 15-folded risk for LBP compared to those without such a history (OR=15.14, 95% CI:7.65-29.98).

Pushing heavy objects: Teachers who had a history of pushing heavy objects were at 16-folded risk for LBP compared to those without such history (OR=16.07, 95% CI:7.84-32.93).

Direct back trauma: Compared to teachers without history of direct back trauma, those with history of back trauma were at significantly higher risk for LBP (OR=12.14, 95% CI:3.60-40.89)(Table 8).

Table 8: Life style risk factors for low back pain among male teachers, Taif.

Life style variables	Low back pain		Crude Odds ratio	95% Confidence intervals
	No N (%)	Yes N (%)		
Regular exercise				
Yes ® (n=67)	51 (76.1)	16 (23.9)	1.0	
No (n=153)	43 (28.1)	110 (71.9)	8.15	4.20-15.83*
Lifting heavy weight				
No ® (n-111)	79 (71.2)	32 (28.8)	1.0	
Yes (n=107)	15 (14.0)	92 (86.0)	15.14	7.65-29.98*
Pushing heavy objects				
No ® (n=119)	82 (68.9)	37 (31.1)	1.0	
Yes (n=99)	12 (12.1)	87 (87.9)	16.07	7.84-32.93*
Direct back trauma				
No ® (n=175)	88 (50.3)	87 (49.7)	1.0	
Yes (n=39)	3 (7.7)	36 (92.3)	12.14	3.60-40.89*

®: Reference category * p<0.05

3.3 Risk factors for low back pain: Multivariate logistic regression

Table 9 demonstrates that older teachers (>45 years) were more likely to have LBP compared to younger teachers (25-35 years) (OR=2.91, 95%CI: 1.19-7.31). Obese teachers (class 2/3) were at almost sixteen-folded risk for LBP opposed to normal BMI teachers (OR=16.08, 95%CI: 3.05-142.02). Teachers who did not practice regular physical exercise were more likely to develop LBP compared to those practicing regular physical exercise (OR=7.09, 95%CI: 2.95-11.73). Those who had a history of lifting or pushing heavy weights were at higher risk for LBP opposed to those who had no history of lifting or pushing heavy weights (OR=11.15, 95%CI: 6.61-21.37 and OR=9.61, 95%CI:5.63-24.35, respectively). Teachers who had history of direct trauma to the back were more likely to report LBP compared to those without such a history (OR=10.05, 95%CI: 3.02-36.52). Teachers who changed their fixed position at work were at almost five-folded risk for LBP opposed to those without fixed position at work (OR=5.29, 95%CI: 2.93-11.25). Teacher`s income, marital status, experience, and hypertension were not significant risk factors and thus, removed from the final logistic regression model.

Table 9: Risk factors for low back pain among male teachers: Multivariate logistic regression analysis.

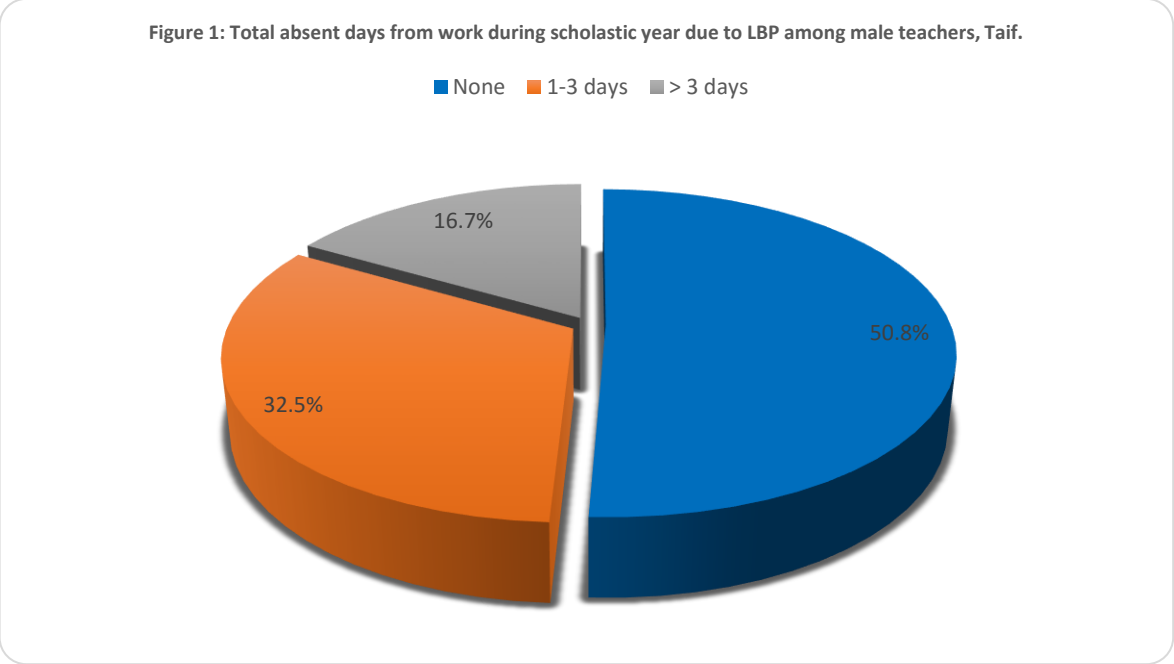
Risk factors	Adjusted OR	95% Confidence intervals
Age (years)		
25-35 ® (n=66)	1.0	
36-45 (n=109)	1.36	0.98-3.77
>45 (n=45)	2.91	1.19-7.31*
Body mass index		
Normal ® (n=48)	1.0	
Overweight (n=112)	1.30	0.71-2.96
Obesity class 1 (n=39)	1.69	0.78-4.28
Obesity class 2/3 (n=19)	16.08	3.05-142.02*
Regular exercise		
Yes ® (n=67)	1.0	
No (n=153)	7.09	2.95-11.73*
Lifting heavy weight		
No ® (n-111)	1.0	
Yes (n=107)	11.15	6.61-21.37*
Pushing heavy objects		
No ® (n=119)	1.0	
Yes (n=99)	9.61	5.63-24.35*
Direct back trauma		
No ® (n=175)	1.0	
Yes (n=39)	10.05	3.02-36.52*
Fixed position at work		
No ® (n=137)	1.0	
Yes (n=78)	5.29	2.93-11.25*

(R): Reference category ; OR: Odds Ratio

Income, marital status, experience, and hypertension were removed from the final model (not statistically significant).

3.4 Impact of low back pain on work performance of teachers

Figure 1 illustrates that 16.7% of male teachers reported more than three days of absenteeism during scholastic year due to LBP.



As shown in table 10, among teachers who reported total absent days of more than three days, 77.1% had LBP compared to 46.1% among those who reported no absence from schools. This difference was statistically significant. Work grade and work percent of teachers were not significantly affected by history of LBP among them.

Table 10: Impact of low back pain on work performance of male teachers, Taif.

Variables	Low back pain		χ^2 (p-value)
	No N (%)	Yes N (%)	
Total absent days			
None (n=76)	41 (53.9)	35 (46.1)	
1-3 (n=95)	42 (44.2)	53 (55.8)	
>3 (n=48)	11 (22.9)	37 (77.1)	11.68 (0.003)
Work grade during last scholastic year			
Good (n=7)			
Very good (n=21)	4 (57.1)	3 (42.9)	
Excellent (n=192)	11 (52.4)	10 (47.6)	
	79 (41.1)	113 (58.9)	1.59 (0.451)
Work % during last scholastic year			
<90 (n=29)			
90-95 (n=93)	15 (51.7)	14 (48.3)	
>95 (n=97)	37 (39.8)	56 (60.2)	
	42 (43.3)	55 (56.7)	1.30 (0.523)

4. Discussion

The aim of the study is to inspect the low back pain prevalence together with its associated risk factors among high school teachers in Taif, Saudi Arabia. Teachers in school signifies an occupational group among which a high prevalence of the low back pain is observed. Therefore, the low back pain was highly prevalent (57.3%) among male high school teachers in the current study. This figure is higher than that reported among male teachers in Salvador (41.1%), [28] Malaysia (39.6%) [29] and China (45.6%) [30]. While, it is lower than that reported among male physical education teachers in Athens (63%), [31] "secondary school teachers" in Hong Kong (59.2%), [32] and teachers for physically as well as intellectually disabled individuals in Japan (76.7%) [33].

In the current study, the association between LBP and age > 45 years might be elucidated by natural wear of an individual's body. Nevertheless, this practice might be influenced by the "work environment", organization of work, in addition to the type of developed activity [34]. Thus, age will be a factor related to the occurrence of pain. Reis et al [35] conferred that instructors having more professional experience are less vulnerable to the negative work effects on the health. Conversely, if the time in the profession is manifested by constraint to gain an experience as a professor, exposure may be linked with adverse health situations. In agreement with this finding, we observed that teachers with longer experience were at a higher significant risk for LBP however, this effect disappeared after controlling for other confounders in multivariate logistic regression analysis.

The outcomes of the study were not consistent with the results in the previous literature which indicates that having more children relates to additional time dedicated to looking after children, need of a higher work load so as to increase the income of the family, more psychological stress being one of the possibility [36]. Hence, it

attributed to sufficient economic status of the teachers in a specific community. The nature of teaching job includes writing on blackboard. Improper techniques and poor postures of carrying and lifting are the two common low back pain causes. In the meantime, lifting heavy loads is ranked as a key contributing factor, which involves materials for example, equipment, overhead projectors, as well as books [37]. One needs to make use of trolleys mainly while handling laboratory instruments. Standing or seating and poor posture was ranked as a third or second major risk factor. It includes twisting for example, turning from the board to the class and back again. Continued sitting mainly ensued when teachers prepared and marked work on the computers. Similar standing position was shared by all teachers mainly encouraging the occurrence of lower back pain [38]. Working longer hours on computer makes one prone to other musculoskeletal disorders, for example, upper limb pain and neck pain. Furthermore, the teachers may crane their neck during typing, considerably making the back and shoulders more intense mainly causing pain. In agreement with these findings, in the present study, lifting and/or pushing heavy weight were significant risk factors for LBP in "multivariate logistic regression" analysis. However, hours of sitting, standing or computer use were not proved as risk factors for LBP.

Abdul Samad et al. [29] demonstrated that status of an individual mental health primarily reflected psychosocial factors as well as was the noteworthy contributing factor to the low back pain issue among the primary school teachers. In the current study, psychological problems were not significant risk factors for LBP. This contradiction could be attributed to the difference in the target population (primary school versus high school teachers).The low back pain risk factors were thought to include individual factors such as "age, body weight, and biomechanical factors" for example, lifting or pushing heavy objects, direct back trauma, and prolonged fixed postures. The same findings have been reported in similar studies [29, 39 - 41]. In school, the nature of job of a teacher contained within all the risk factors mentioned above. In the current study, direct back trauma and static posture were positively concomitant to the low back pain. Comparable findings were reported by others in another study conducted among school teachers in China [42].

Psychosocial factors have been associated positively with low back pain among school teachers, and a systematic review conducted by Erick and Smith [43] suggested that "psychosocial factors for instance, high workload/demands, low social support, high perceived stress level, low job control, low job satisfaction and monotonous work were most likely associated with LBP among school teachers. This may occur because teachers often work in stressful conditions with large classes, a lack of educational resources, and limited reward for their work" [44]. In the current study, we were not able to confirm that. A more detailed study concentrated on psychological factors is warranted in future.

4.1 Limitations

Our study had several limitations. Knowledge about associated factors and low back pain were needed by different self-reporting procedures. Due to the nature of this retrospective questionnaire survey, it is hard to rule out

the possibility of recalling bias thus, leading to under or overestimation. Moreover, being a cross sectional study, precisely, associations can be established, while, no causality inferences can be made. Finally, it included only male teachers because of cultural constraints so, we could not compare prevalence and risk factors between male and female teachers.

5. Conclusion

The LBP prevalence among high school teachers in Taif, Saudi Arabia is high as well as comparable to the prevalence in other countries. Different people (such as old age or obese class 2 or 3), occupational factors (changing fixed position, lifting/pushing heavy objects, direct back trauma) and life style (not practicing regular physical exercise) were important associations of LBP. Low back pain has a significant impact on the absence of school teachers from schools. Carrying heavy material to classroom and school, walking either outside or inside the school, installation of teaching resources and equipment might be related to the LBP occurrence. Effective preventive strategies need to address this area such as: organizing health educational sessions by school health physicians aiming at identifying the common risk factors for them and ways to deal with them. Distributing pamphlets, booklets etc. about risk factors, preventive measure as well as impact of LBP on teachers` performance. Conducting further studies, preferably longitudinal, including female physicians in order to compare the prevalence and risk factors between both. Diverse interventional models are needed for developing an effectual preventive strategy for those relatively underestimated. It therefore exemplifies a major step forward in the LBP prevention among teachers specifically if easy to implement control measures can be recommended such as measures at school level for instance, optimizing working hours per day for teachers, good quality tables and chairs suitable for teachers obliges them to develop favorable positions, and proportional workload reduction for aging teachers. Adoption of public policies to improve the teacher's working conditions. Health promotion and educational programs aiming to wearing flat medical shoes and maintain ideal weight should be encouraged in future.

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