

Low Back Pain and Associated Factors among Teachers in Gondar Town, North Gondar, Amhara Region, Ethiopia

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Abstract

Background: Low back pain prevalence is somewhat higher in the wealthier countries (42% vs. 35%). But, the epidemiological information regarding the prevalence and associated risk factors of low back pain among universities, colleges and school teachers in Ethiopia are unknown. Thus the aim of this study is to investigate the prevalence and associated risk factors of low back pain among universities, colleges and school teachers in Ethiopia, particularly in Gondar town.

Methods: To assess prevalence of low back pain and associated factors among primary and secondary school, and higher institution (college and university) teachers in Gondar town, an institution based cross-sectional quantitative study was conducted. A total of 662 teachers were included in the study. Teachers in the town were selected by stratified random sampling from their institutions in which they work. Both bivariate and multivariate logistic regression techniques were used to identify factors associated with low back pain.

Results: Of 602 teachers, 346 (57.5%) experienced low back pain (LBP) throughout their job career. The twelve month prevalence of LBP among teachers was 324 (53.8%). Doing regular physical exercise [AOR=0.52, 95%CI: 0.34, 0.82], provisions of office at working institution [AOR=0.52, 95%CI: 0.33, 0.81] and satisfaction with working environment and culture [AOR=0.55, 95%CI: 0.36, 0.86] were among factors significantly associated with low back pain.

Conclusion: This study showed high prevalence of low back pain among teachers. Doing regular physical exercise, provisions of office at working institution and satisfaction with working environment and culture, were among the most contributing factors in reducing low back pain. Therefore, doing regular physical activity, avoiding their smoking habit, Getting enough time for sleep and avoiding worries reduces the risk of low back pain among teachers.

Keywords: Teachers' low back pain; School environment

Background

The World Health Organization has defined a work related-disorder as one that results from a number of factors, and 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]. Low back pain (LBP) is one of Musculoskeletal disorders and discomfort, localized between the coastal margin (bottom of ribs) and above the inferior gluteal folds (top of legs), with or without related leg pain from any cause [3]. Work-related low back pain is any back pain originating in the context of work and considered clinically to have been probably caused, at least in part, or exacerbated by the job climates [4]. It was identified by the world Health Organization as one of the top three occupational health problems to be targeted by surveillance within the WHO [5].

Several authors have argued that low back pain is most accurately classified as pain associated with serious pathology, pain associated with nerve compression, or non-specific low back pain (NSLBP). Non-specific chronic low back pain is considered a major health problem in industrialized countries. It leads to disability, absenteeism and

considerable annual health costs [6].

Work related low back pain is associated with exposure to ergonomic stressors at work, environmental (physical), psychosocial and/or personal risk factors [4] and it has been estimated that occupational exposures accounted for 37% of the global burden of disease from low back pain. The mean attributable fraction was generally higher for men than for women (41% versus 32%), because men were more frequently engaged in occupations that exposed them to risk [7]. However, the cross sectional study conducted in Malaysia among primary school teachers revealed that the prevalence of low back pain was higher among women (48.1%) than men (39.6%) [8]. Low back pain prevalence is somewhat higher in the wealthier countries than developing countries (42% vs. 35%) [9].

Low back pain does not only signify poor quality of individuals'

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life, but also showed decreased in labor productivity due to off work, absenteeism and early retirement [10]. Low back pain cases associated with an initial episode could be resolved within 2-4 weeks [11]. It had been observed that individuals who suffered from low back pain problems might develop major physical, social and mental disruptions, which could affect their occupations [12]. Physical impact includes the loss of physical function and deteriorated general health. Social impact included decreased participation in social activities. Psychosocial impacts are manifested through insomnia, irritability, anxiety and depression [13].

A study in Ireland showed that one of the leading causes for ill health retirement among school teachers was musculoskeletal problems, which contributed to 10% of the ill health retirement in the population [14]. The cross sectional study conducted in Malaysia in 2007 indicates that about 11.6% out of 2600 populations in a semirural area were diagnosed with low back pain problem [15]. The other study conducted in Klang Valley, Malaysia, also revealed that prevalence of low back pain among primary school teachers was 40.4% [8].

The survey conducted in Greece, Athens on physical education teacher was revealed that the prevalence of LBP during the survey was 33 % [16]. The cross sectional study conducted in Shanghai, People's Republic of China also indicated that the prevalence of low back pain among teachers was 40 % [17]. The same study conducted in Japan among staffs in schools for physically and mentally handicapped children shown that the prevalence of low back pain among teachers were 45.8% and the prevalence was higher among female (47.6%) than males (42%) [18].

Cross sectional study on the working conditions and health of teachers of the municipal teaching network of Salvador, Bahia, Brazil indicated that the prevalence of low back pain among teachers were 41.1%. The pain in the teachers was higher among women than men [19].

A systematic review of 27 studies conducted in Africa revealed that the mean LBP point prevalence among the adolescents was 12% and among adults was 32%. The average one year prevalence of LBP among adolescents was 33% and among adults was 50%. The average lifetime prevalence of LBP among the adolescents was 36% and among adults was 62 %. The most common population on which research had been conducted was 'workers' (48%) [3].

To prioritize prevention efforts appropriately world-wide, information on the burden caused by occupational exposure to LBP stressors would be useful. Broad investigations have been made for LBP in the developed world in different work set up, even though most studies are emphasized at health care work set up and a few studies are conducted on low back pain in developing countries like Africa.

In Ethiopia, particularly in Gondar, regarding LBP no study has been conducted in school environment with regards to teachers as well as on the general populations. So the information on LBP prevalence and associated risk factors in Gondar town among teachers and general populations is unknown. Therefore, there is a need to study the problem of low back pain among teachers.

Methods

Study design and period

To assess prevalence of low back pain and associated factors among primary and secondary school, and higher institution (college

and university) teachers in Gondar town, an institution based cross-sectional study was conducted in Gondar town, North Gondar, Amhara Region, Ethiopia from March 28, 2011 to April 08, 2011.

Study area

Gondar town, which is the capital of North Gondar zone, is one of the historical towns in the country and located at 727km Northwest of Addis Ababa. According to the 2007 Ethiopian census report, Gondar has a total population of 206,987 and more than half (108,902) of them are females [20]. Administratively the town is divided into 12 administrative areas. It has one University, 1 College, 1 Technical and Vocational school, 7 secondary schools and 40 primary schools. The total numbers of teachers in the town were 2532, of which 1100 working in the higher institutions (college and university), 395 were working in the secondary schools and 1037 in the primary school.

Sample size

Among all teachers in the town, all teachers who had one year and above work experience were included in the study. Sample size was determined using the formula for single population proportion by considering 50% prevalence, since we could not get study conducted on this topic in Ethiopia and other similar countries in Africa, 95% level of confidence and 4% margin of error. By adding 10% non response rate, the final sample size was 662 teachers.

Sampling technique

To select the study participants stratified probability sampling technique was employed based on their institution. Teachers in the town were stratified in to higher institution, secondary and primary schools teachers. The number of teachers included in the study from each institution were determined proportionally among each stratum and selected by using computer generated random number.

Data collection process

Data on low back pain, socio demographic characteristics, environmental factors, psychosocial factors, behavioral factors and co morbidity were collected using self administered, structured and pre-tested questionnaire which was developed by reviewing literature in order to address the objectives of the study. The questionnaire was prepared originally in English and translated to Amharic and back to English by language experts to keep the consistency of the questions. There were sixty one questions prepared to address the objectives. Training for data collectors and supervisors was made to ensure the quality of data. The questionnaire was pre-tested to identify potential problem of the questionnaires, unanticipated interpretations and cultural objections to any of questions on 33 (5%) respondents having similar characteristics with the study subjects nearby Gondar town colleges and school teachers. Based on the pre test results, the questionnaire was additionally adjusted contextually and terminologically, reliability analysis was done and 0.73 cronbach's alpha was reported, and administered on the whole sample of teachers on 28, 2011 to April 08, 2011 by data collectors. Counter checking of daily filled questionnaire and regular supervision were made by supervisor.

Data Analysis

Data were entered, cleaned and edited using EPI INFO 2002 statistical software and then exported to SPSS version 13.0 for further analysis. Descriptive statistics of the collected data were done for

most variables in the study using statistical measurements. Frequency tables, graphs, percentages, means and standard deviations were used. Bivariate analysis was conducted primarily to check which variables have association with the dependent variable individually. Variables found to have association with the dependent variables at 0.2 probability were then entered in to multivariate logistic regression for controlling the possible effect of confounders and finally the variables which have significant association were identified on the basis of OR, with 95% CI and 0.05 p-values to fit into the final model.

Ethical consideration

The study was carried out after getting permission from the ethical review board of school of public health, university of Gondar. Then, an informed consent was obtained from each institutions and study participants to participate in the study. Those teachers who refused to participate in the study were not forced. Each respondent was informed about the objective of the study. Confidentiality was granted for information collected by keeping the privacy of the respondents while filling the questionnaire, giving cods for each questionnaire and arranging a collection box to drop the responses by themselves. Seriously ill teachers were advised to visit the health institutions.

Results

Socio-Demographic characteristics of teachers

A total of 602 (90.9%) teachers responded with non response rate of 9.1%. Out of the total respondents 411 (68.3%) were males. About 320 (53.2%) of the respondents were married. Respondents' ages range from 21 to 59 year with mean (standard deviation) of 38 (± 11.024) years. The majority, 258 (42.9%) were in the age group of 40-59 years.

Majority, 521 (86.6%), of teachers were Orthodox followed by Muslim 49 (8.1%). Concerning the educational levels of the teachers majority of the teachers, 241 (40%), were Bsc. Degree holders followed by certificate holders, 96 (15.9%).

The mean (standard deviation) work experience of the teachers were 16.2 (± 9.8) year. More than half 312 (51.8%) of the respondents had work experience of above 10 years. About 162 (26.9%) of the respondents had monthly salary in the range of 2058 - 2531 Birr per month with median monthly salary of the respondents being 2351.00 Birr (Table 1).

Low back pain prevalence among teachers

Of 602 respondents, 346 (57.5%) experienced low back pain throughout their job career. The twelve month prevalence of LBP among teachers was 324 (53.8%). Out of the respondents with LBP in the last twelve months 196 (60.5%) knew the cause of their LBP. From the total respondents with LBP 116 (33.5%) were felt the pain during standing (Table 2).

Majority of the respondents 191 (59%) experienced sub acute low back pain (Figure 1).

In this study the prevalence of LBP was higher among female (75.9%) than male teachers (48.9%). It also higher among teachers who had smoking habit (79.1%) than who had no smoking habit (55.8%). Among age group of teachers the higher prevalence observed in the higher age groups of teachers (Figure 2).

Behavioral characteristics of teachers

Of 602 respondents, 43 (7.1%) of the teachers had smoking experience, 61(10.1%) had khat chewing experience, 187 (31.1%) had

Variable	n (%)	
Sex	Male	411 (68.3)
	Female	191 (31.7)
Age	<30	245 (40.7)
	30-40	99 (16.4)
	≥ 40	258 (42.9)
Religion	Orthodox	521 (86.6)
	Muslim	49 (8.1)
	Protestant	27 (4.5)
	Catholic	5 (0.8)
Educational level	Certificate	96 (15.9)
	Diploma	125 (20.8)
	Bsc, degree	241 (40)
	Doctorate decree	53 (8.8)
	Master	87 (14.5)
Marital status	Single	320 (53.2)
	Married	217 (36)
	Divorced	34 (5.7)
	Widowed	17 (2.8)
	Separated	14 (2.3)
Work experience	<10	290 (48.2)
	≥ 10	301 (51.8)
Monthly salary	<2058	155 (25.7)
	2058-2351	162 (26.9)
	2351-3820	146 (24.3)
	≥ 3820	139 (23.1)
BMI	Under weight	37 (6.1)
	Normal	429 (71.3)
	Overweight	130 (21.6)
	Obese	6 (1)

Table 1: Socio demographic characteristics of teachers in Gondar town, April, 2011, (n =602).

Variables	Yes, n (%)	No, n (%)	
LBP through entire job career	346 (57.5)	256 (42.5)	
LBP in the last twelve month	324 (53.8)	278 (46.2)	
Knew cause of low back pain	196 (60.5)	128 (39.5)	
	Prolonged standing	166 (84.7)	30 (15.3)
	Prolonged sitting	14 (7)	182 (93)
	Lifting heavy loads	26 (13.3)	170 (86.7)
	Sitting and doing work on computer	17 (8.8)	179 (91.2)
	Injury in the lower back	17 (8.8)	179 (91.2)
Feel LBP during standing	116 (33.5)	230 (66.5)	
Feel LBP during sitting	77 (22.3)	269 (77.7)	
Feel LBP during sleeping	64 (18.5)	282 (81.5)	
Feel LBP during walking	21 (6)	325 (94)	
Feel LBP during physical exercise	20 (5.8)	326 (94.2)	

Table 2: Prevalence and characteristics of LBP among teachers in Gondar town, April, 2011, (n =602).

alcohol drinking experience, 179 (29.7%) had sleeping disturbance during sleeping, 160 (26.6%) had experience of doing physical exercise and 307 (51%) had proper eating habit. The mean sleeping time of the respondent was 7.3 with 1.93 standard deviation and 500 (83.1%) of the teachers had sleeping time less than eight hour per day.

Working environment characteristics

Almost all of the respondents 589 (97.8%) had standing position

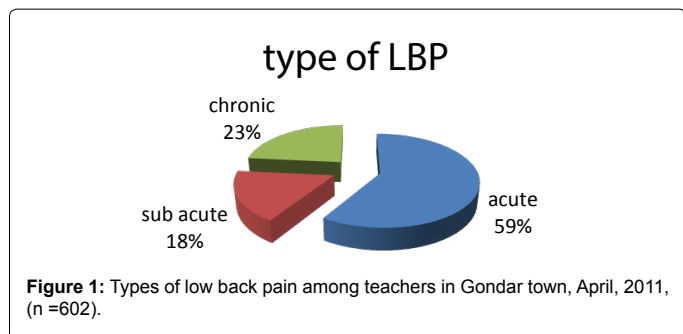


Figure 1: Types of low back pain among teachers in Gondar town, April, 2011, (n =602).

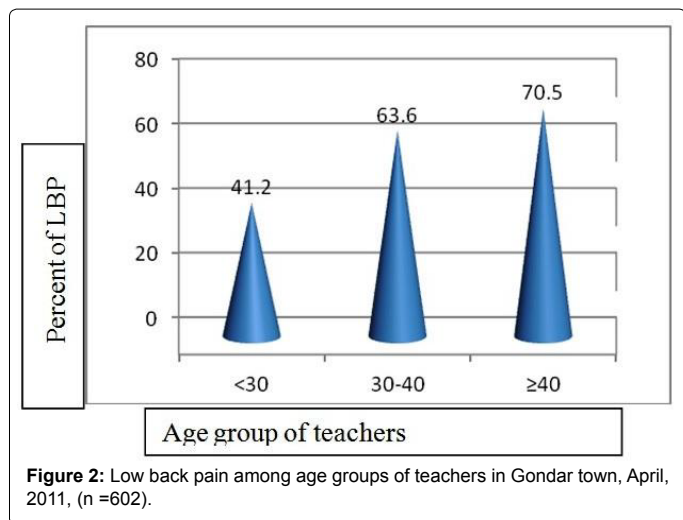


Figure 2: Low back pain among age groups of teachers in Gondar town, April, 2011, (n =602).

during their work (teaching). The mean time of standing without break during teaching per day was 3.8hour with standard deviation of 1.5 hour. Only 153 (25.4) teachers responded that they exposed to prolonged sitting due to their work. The mean time exposed to sitting due to their work was 4.8hour per day with 2.1 hour standard deviation.

Out of the total respondents 165 (27.4%) lifted a heavy materials, of which 31 (18.8%) lifted teaching aid devices and 134 (81.2%) lifted other heavy materials. Regarding work shift of the teachers 466 (77.4%) were working in the day, 19 (3.2%) were working in the evening and 117 (19.4) were working at both work shift.

One hundred eighty two or thirty point two percent of the total respondents had extra work other than teaching in their institution, and the mean time of extra work per week for the respondents who work in other than their institution were 3.5 hour with 2.2 hour standard deviation. The mean total work load of the respondents in their institution in hour per week was 20.50 hour with standard deviation of 11.70 hour (Table 3).

Psychosocial characteristics

From 602 respondents 307 (51%) were satisfied with their working environment. About 354 (58.8%) of the teachers were feel happy at work. Four hundred eighty eight or eighty one point one percent teachers responded that they had good relationship with their boss. Out of the total respondents 332 (55.1%) got support at their work area. Of 602 respondents 326 (54.2%) got angry at the other persons more often than usual (Table 4).

Co morbidity characteristics

About 224 (37.2%), 86 (14.3%) and 86 (14.3%) of the total respondents responded that they had recurrent severe headache, asthmatic problem and history of low back injury respectively. Out of 224 (37.2%) with recurrent severe headache 93 (41.5%) responded that they experienced LBP during their headache. From the total 86 (14.3%) asthmatic respondents 41 (47.7%) were responded that they experienced LBP during asthmatic pain (Table 5).

Factors associated with low back pain

Socio demographic, behavioral, working environment, co morbidity and psychosocial factors in relation to low back pain (LBP) were analyzed by bivariate and multivariate analyses using logistic regression model. In the bivariate logistic regression analysis, LBP was associated significantly with sex, age, working experience, monthly salary, smoking habit, sleeping disturbance, regular physical exercise, prolonged sitting, work shift, lifting heavy materials, provisions of office, Satisfaction with working environment and culture, getting angry at others more often than usual, having stress and getting support from the others at work. However, in the multivariate logistic regression analysis, LBP was associated significantly with sex, age, smoking habit, sleeping disturbance, regular physical exercise, provisions of office, satisfaction with working environment and culture, having stress, recurrent severe headache and history of low back pain (Table 6).

Discussion

This study disclosed the prevalence of low back pain and its associated risk factors among primary and secondary school, and higher institution teachers in Gondar town. The prevalence of low back pain among teachers was 57.5% throughout their work career. The twelve month prevalence among respondents was 324 (53.8%) which is similar with the systematic review of six studies in Africa on general population which ranged from 28% to 74% [3]. However, it is higher than the studies conducted in Klang Valley, Malaysia, (40.4%) [8], Salvador, Bahia, Brazil (41.1%) [19] and Shanghai, People's Republic of China (40%) [18]. One of the possible reasons causing difference in the prevalence of LBP could be the facility provided for the teachers at their institution or social and economic differences between Ethiopia and the countries of the studies mentioned, the way in which work was organized and the protective factors involved contribute to the differences observed in comparison to the present study. The other possible reason could be the combination of study participant since this study covered all teachers from primary school to higher institution teachers.

In this study, female teachers showed a significantly higher prevalence of low back pain (75.9%) than men (48.9%). Female teachers were more than three times more likely to experience LBP when compared to males [AOR=3.23, 95% CI: 2.10, 5.26]. The result was consistent with a study conducted in Salvador, Bahia, Brazil [19] (26), Klang Valley, Malaysia [8] and Japan [10]. The possible reasons for the gender difference might be the nutritional status of females where females were seen to be obese than males in the study. The previous study indicated that there was a relationship between low back pain and obesity status of the individuals [21]. Even though obesity was not significantly associated with LBP In this study, all the obese study participants were females. The other possible reason could be males had

Variables	Yes, n (%)	No, n (%)
Prolonged standing during teaching	589 (97.8)	13 (2.2)
Exposed to prolonged sitting due to work	153 (25.4)	449 (74.6)
Prolonged sitting due to exam marking	66 (43.1)	87 (56.9)
Prolonged sitting due to assignment marking	21 (13.7)	132 (86.3)
Prolonged sitting due to internet use	56 (36.6)	97 (63.4)
Have office	173 (28.7)	429 (71.3)
Have chair and table in the office	157 (90.8)	16 (9.2)
Chair suited per your height	91 (58)	66 (42)
Table suited per your height	91 (58)	66 (42)
Use teaching aid device	557 (92.5)	45 (7.5)
Chalk and board only	439 (79.8)	118 (21.2)
Flip chart	116 (20.8)	441 (79.2)
Over head projector	56 (10.1)	501 (89.9)
Laptop and LCD	72 (12.9)	485 (87.1)
Lift heavy material	165 (27.4)	437 (72.6)
Extra work other than in their institutions	182 (30.2)	420 (69.8)
Ventilation problem at working class	363 (60.3)	239 (39.7)
Low lighting problem at working class	110 (18.3)	492 (81.7)
Noise problem at working class	243 (40.4)	359 (59.6)
High thermal problem at working class	269 (44.7)	333 (55.3)

Table 3: Working condition of teachers in Gondar town, April, 2011, (n =602).

Variable	Yes, n (%)	No, n (%)
Satisfaction with working environment and culture	307 (51)	295 (49)
Feel happy at work	354 (58.8)	248 (41.2)
Get angry at others	326 (54.2)	276 (45.8)
Get angry at family	69 (21.2)	257 (78.8)
Get angry at colleagues	68 (20.9)	258 (79.1)
Get angry at boss	122 (37.4)	204 (62.6)
Have stress	175 (29.1)	427 (70.9)
Family related stress	31 (17.7)	144 (82.3)
Stress of financial constraint	29 (16.6)	146 (83.4)
Health related stress	40 (22.9)	135 (77.1)
Stress at work	52 (29.7)	123 (70.3)
Good relationship with boss	480 (79.7)	122 (20.3)
Get support at work	332 (55.1)	270 (44.9)
Support from colleagues	215 (64.8)	117 (35.2)
Support from boss	107 (32.2)	225 (67.8)

Table 4: Psychosocial characteristics of teachers in Gondar town, April, 2011, (n =602).

Variable		n (%)
Recurrent severe headache	yes	224 (37.2)
	no	378 (62.8)
Feel LBP during headache	yes	93 (41.5)
	no	131 (58.5)
Asthmatic problem	yes	86 (14.3)
	no	516 (85.7)
Feel LBP during asthma	yes	41 (47.7)
	no	45 (52.3)
History of LB injury	yes	86 (14.3)
	no	516 (85.7)

Table 5: Co morbidity characteristics of teachers in Gondar town, April, 2011, (n =602).

Variables	Low back pain					
		Yes, n	No, n	Crude OR (95% CI)	Adjusted OR (95%CI)	p-value
Sex	Male	201	210	1	1	
	Female	145	46	3.22 (2.22,4.76)	3.23(2.10,5.26)	0.001**
Age	≥ 40	182	76	3.41 (2.36,4.94)	2.34(1.34,4.07)	0.008**
	30-40	63	36	2.50 (1.54,4.04)	1.70(1.95,3.04)	0.003**
	<30	101	144	1	1	
Work experience	≥ 10	215	97	2.69 (1.93,3.75)*		
	<10	131	159	1		
Monthly salary	≥ 3820	68	71	0.64 (0.41,1.04)*		
	2351-3820	70	76	0.63 (0.4,0.99)*		
	2058-2351	116	46	1.73 (1.08,2.76)*		
	<2058	92	63	1		
smoking	Yes	34	9	2.99 (1.41,6.35)	2.65 (1.11,6.32)	0.028**
	No	312	247	1	1	
Sleeping disturbance	Yes	129	50	2.45 (1.68,3.57)	1.91 (1.22,3.01)	0.005**
	No	217	256	1	1	
Regular physical exercise	Yes	69	91	0.45 (0.31,0.65)	0.52 (0.34,0.82)	0.004**
	No	277	165	1	1	
Prolonged sitting at work	Yes	74	79	0.61 (0.42,0.88)*		
	No	272	177	1		
Work shift	Day	259	207	0.84 (0.56,1.27)*		
	Night	17	2	5.70 (1.26,25.86)*		
	Both	70	47	1		
Have office	Yes	67	106	0.34 (0.24,0.49)	0.52 (0.33,0.81)	0.003**
	No	279	150	1	1	
Lift heavy material	Yes	106	59	1.48 (1.02,2.14)*		
	No	240	197	1		
Satisfaction with working environment and culture	Yes	161	146	0.66 (0.47, 0.91)	0.55 (0.36,0.86)	0.009**
	No	185	110	1		
Get angry at others	Yes	210	116	1.86 (1.34, 2.59)*		
	No	136	140	1		
Have stress	Yes	134	41	3.31 (2.23,4.93)	2.18 (1.36,3.50)	0.001**
	No	212	215	1		
Get support at work	Yes	176	156	0.66 (0.48,0.92)*		
	No	170	100	1		
History of LB injury	Yes	67	19	3.00 (1.75,5.13,)	1.96 (1.04,3.69)	0.037**
	No	279	237	1	1	

Table 6: Factors associated with low back pain among teachers in Gondar town by multivariate and bivariate logistic regression. April, 2011 (N=602)
*Associated only by univariate analysis, ** Associated both by both univariate and multivariate, at p-value ≤ 0.05

shown to practice doing regular physical exercise than females in this study. Moreover, women were more likely to report any pain problem than men as women tended to have a lower pain threshold than men.

In this study an increase in LBP with age was observed. Teachers who were 40 years and above were more than two times more likely to develop LBP when compared to those who were less than 30 years old [AOR:2.34, 95% CI: 1.34,4.07]. Whereas, Teachers in the age group of 30 and 40 years were 1.70 times more likely to develop LBP when compared to those who were less than 30 years old [AOR:1.70,95% CI: 1.95,3.04]. This result is consistent with the study conducted in Salvador, Bahia, Brazil [19]. The possible reason for the difference among these age groups could be as the age of the teachers increase

exposure to other risk factors for LBP will also increase. The other possible reason could be the natural wear of the body as the age become older and older [22].

Teachers who had smoking habit were more likely to develop LBP. Smokers were 2.65 times more likely to develop low back pain when compared to non smokers [AOR=2.65, 95%CI: 1.11, 6.32]. This result was consistent with the study conducted in Malaysia [8]. The possible reason for the difference between smoker and non smokers could be smoking clogs up the arteries which impair the supply of blood and oxygen to the lower spine. This deteriorates the spinal discs and blocks the body's ability in delivering nutrients to the discs of the lower back. With inadequate nutrition the tissues of the lower back get damaged, which finally results in back pain. Sleeping disturbance was the other

behavioral characteristics which had effect on low back pain in this study. Teachers who had been disturbed during sleeping were 1.91 times more likely to experience low back pain when compared to those who were not disturbed during sleeping [AOR=1.91,95% CI:1.22, 3.01]. This result was similar with study in Japan [18]. The possible reason for the difference could be those who were disturbed during sleeping lack sufficient rest than those who did not.

Regular physical exercise was the other variable which had adverse effect on low back pain. Teachers who did regular physical exercise were 0.52 times less likely to develop LBP when compared to those who did not [AOR=0.52, 95%CI: 0.34, 0.82]. This finding was in line with the study conducted in Athens, Greece on physical education teachers (PET) [16]. The possible explanation might be 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.

Availability of the office at the working institution of teachers was shown to be significantly associated with low back pain. Teachers who had office at their institution were less likely to develop low back pain when compared to those teachers without office [AOR=0.52, 95%CI: 0.33, 0.81]. This result was similar with the study conducted in Brazil [19]. The possible reason could be lack of office means indirectly lack of appropriate chairs and tables in size and shape for teachers which lead them to sit in positions unfavorable to the lower back. So, teachers who had office at their working institution might take appropriate rest immediately after prolonged standing when compared to those who had no office at their working institution.

This study showed that satisfaction with working environment and culture, which reflects psychosocial factor, was significant contributing factor to the LBP. Teachers who were not satisfied with their working environment and culture were 1.82 times more likely to experience LBP [AOR=0.55, 95%CI: 0.36, 0.86]. Stress was the other psychosocial factors strongly associated with LBP. Teachers who had stress were 2.18 times more likely to develop low back pain when compared to those who had no stress [AOR=2.18, 95%CI: 1.36, 3.50]. This finding was consistent with the study conducted in Japan on general population [23]. The probable explanation for this could be as it was shown in study conducted in Japan, the more psychological demands needed for a certain tasks, the greater is the possibility to develop musculoskeletal disorder; whatever the anatomical area is.

In this study previous history of injury in the lower back had significant impact on the back pain. Teachers who had history of lower back injury were 1.96 times more likely to develop LBP when compared to teachers who had no history of low back injury [AOR=1.96, 95%CI: 1.04, 3.69]. This result was consistent with study conducted in France among workers from four occupational sectors [24]. The possible explanation for this could be injury in the lower back is directly related to LBP.

Even though this study tried to address some important factors, the result of the study was depending on self reported data of the participants which was susceptible to recall bias causing under or overestimation, the effect of increasing the amount of certain factors like cigarette smoked per day and alcohol drank per day were not addressed, the study was not out of the limitations of cross sectional study like identifying the temporal relationship, and measurements for lighting, noise and temperature had not taken.

Conclusion

In conclusion, this study showed high prevalence of low back pain among teachers. Sex, age, doing regular physical exercise, provisions of office at working institution, satisfaction with working environment and culture, smoking habit, sleeping disturbance, having stress and history of low back injury were among the factors associated with LBP. Doing regular physical exercise, provisions of office at working institution and satisfaction with working environment and culture, were among the most contributing factors in reducing low back pain. Whereas, smoking habit, sleeping disturbance, having stressed and history of low back injury were lead teachers to the risk of low back pain.

Authors' Contributions

Teresa Kisi, wrote the proposal, participated in data collection, analyzed the data and drafted the paper. Yifokir Tefera and Mezgebu Yital approved the proposal with some revisions, participated in data analysis and revised subsequent drafts of the paper. All authors read and approved the final manuscript.

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