

Work-related Low Back Pain among Garment Industry Workers in Eastern Oromia Region, Ethiopia

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ABSTRACT

Low back pain (LBP) is one of the leading occupational disease imposing the health of working population among developed and developing countries. This study determined the magnitude and associated factors of LBP among garment industry workers in Eastern Oromia, Ethiopia. This institutional cross-sectional study was conducted from the 5th Jan to Apr 2015 on Garment industry workers in Eastern Oromia, on 422 participants. A face-to-face interview was used to collect quantitative data and the Nordic Questionnaires to measure the outcome of interest, LBP, as a worker experiencing self-reported musculoskeletal symptoms in the lower back were defined by aches, pain, or discomfort during the last 12 months. All the questionnaires have been checked visually, coded and entered into SPSS. The magnitude of self-reported LBP was 64.9%. Workers, those had a longer working experience were 2 up to 10 times the chance to have developed work-related LBP than those with shorter work experience. The magnitude of work-related LBP among garment industry is high. Therefore, government, the owner of the companies and other stockholders should focus on the prevention and control of occupational risk factors for work-related LBP in the garment industries.

KEYWORDS: *Low back pain, Sewing machine operators, Work-related musculoskeletal disorders*

INTRODUCTION

Musculoskeletal disorders (MSDs) are the most health problem among the working population by affecting the millions of the health workers [1]. Musculoskeletal conditions are the most common self-reported work-related disease, with high costs incurred from long-term disability among the productive age group of people [2].

Low back pain (LBP) is an important clinical, social, economic, and public health problem affecting the population at whole with lifetime prevalence estimated nearly 70% in industrialized countries [3-4]. LBP is one of the most leading work-related health problems in low-income countries and is associated with considerable absence from work and loss in productivity, resulting in financial burdens to

employers, employees and healthcare systems [5].

Back disorder is a multifactorial disease and it may be associated with both work-related and none work-related factors [6]. The prevalence of lower back musculoskeletal symptoms among operators engaged on the sewing machine was high [7]. Similarly, employees engaged in Communication Company were reported having back musculoskeletal disorders [8], while working in poor posture and monotonous repetitive movements were strongly associated with LBP [9]. "A study carried out among textile workers revealed that increases with age, obesity, smoking, duration of exposure ≥ 10 yr and work involving prolonged hours of sitting were significantly associated with development of LBP and also female workers were twice as likely as males to report LBP (OR 2.2; 95% CI" [10]. This finding provides baseline data for legislators about work-

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related musculoskeletal disorders to incorporate in national policy according to the context of the country and also show the direction for researchers for farther research and for, employer and employee to design prevention strategy for work-related LBP in these segment of the population.

This study determined the magnitude and associated factors of LBP among garment industry workers in Eastern Oromia, Ethiopia.

MATERIALS AND METHODS

This institutional, cross-sectional study was conducted in Glan City, Eastern Oromia from Jan to Apr 2015. The study population was all sewing machine operators workers who are working in garment industries were proportional allocated and randomly selected. Sewing machine operators who are not willing to participate in the study and those employees their working experience less than one year were excluded at the time of data collection. The sample size was determined using the assumptions: Level of confidence taken to be 95%, 5% margin of error and P is the proportion of LBP among garment industry. But since there is no study done on this specific population group in our country the P was taken as 50% and the sample size was 384 and by adding 10% none repose rate 422.

In the data collection process, data were collected using standardized Nordic questionnaire [11]. The questionnaire was translated from English into Afan Oromo and then independently back-translated to English with adjustment of the Afan Oromo version where problems were identified. In the questionnaire, the socio-demographic characteristics, personal and organizational factors and environmental conditions were included. Before the actual data collection, the questionnaire was pre-tested in different area in similar company. The data were coded and entered into SPSS software version 20.0 (Chicago, IL, USA)

To determine the association of the variables bivariate logistic regression analysis was and those variables with $P\text{-value} < 0.15$ were exported to multiple logistic regressions for controlling the confounding factors. The degree of significance between both independent and outcome variables was assessed using odds ratio with 95% confidence interval and also we used to summarize the statics like percentage, mean and standard deviations to show the study population in relation to outcome variables.

Ethical Consideration: The study was carried out after getting permission from the ethical review board (IRB) of University of Gondar.

Informed consent was also obtained from the study participants to participate in the study. Confidentiality was granted for information collected from the individual and by removing the name of study participants from the questionnaires.

RESULTS

Socio-Demographic Characteristics of Workers: Majority respondents (87.7%) were females and (72.5%) were in the age interval of less than 30 yr and the mean age of the respondents was 26.9(+7.2SD). Most of the subjects (64.0%) stayed from 1-5 yr and 23 (5.3%) of them also worked more than 16 yr in the company (Table 1).

Personal Factors of Workers: The majority of the BMI of the participants were categorized under healthy interval. Moreover, the majority of them were not practicing physical health exercise (Table 2).

Working Environment Conditions: All most near to half of the subjects were not satisfied with their job and always exposed to repetitive activities, repeating the same activities within less than 30 sec. Majority of the workers have had enough sufficient light to operate; however, 72.7% of them were not used an adjustable chair (Table 3).

Organizational Factors: Overall, 397(94.1%) participants were permanent and the rest are temporary workers. The majority of modality of payment is 313(74.2%) for the operators were via of hourly rate and the rest was paid in piece rate method and 343(81.3%) of workers did not have break (excluding lunch break). Majority of workers 405(96.0%) are on job but never trained on the occupational health and safety (Table 4).

Prevalence of Work-Related LBP among Garment Factory: The prevalence of work-related back musculoskeletal disorders among garment workers experienced trouble in the last 12-months period were 64.9% of them developed LBP. Out of the 274 (64.9%), operators had low back MSD in the last 12-month period 134 (31.5%) of workers had experienced trouble (ache, pain, and discomfort) greater than 30 d but not every day and 68 (16.1%) of which had ache, pain, and discomfort every day.

Table 1. Socio-Demographic characteristics of workers in garment factories, Galan City, East Ethiopia, Apr 2015

Variables	Number=422	Percent (%)
Sex		
Female	370	87.7
Male	52	12.3
Age(yr)		
>30	306	72.5
30-39	89	21.1
40-49	18	4.3
≥50	9	2.1
Marital Status		
Married	145	34
Divorced	29	6.8
Widowed	21	5.0
Single	227	58.8
Educational level		
Illiterate	45	10.7
Primary School	135	32.0
Secondary School	200	47.4
Higher Education	42	10.0
Monthly Salary		
<700 ETB	138	32.7
700-900 ETB	252	59.7
>900 ETB	32	7.6
Work experience in garment in years		
Mean(SD)	5(±5.2)	
1-5	270	64.0
6-10	118	28.0
11-15	11	2.6
≥ 16	23	5.4

Table 2. Personal factors of workers among garment factories, in Galan City, East Ethiopia, Apr 2015

Variables	Number=422	Percent (%)
BMI		
Underweight (<18.5kg/m ²)	76	18.0
Healthy (18.6-24.9kg/m ²)	325	77.0
Overweight (25-29.9kg/m ²)	17	4.1
Obese (>29.9kg/m ²)	4	0.9
Physical exercise		
None	354	83.9
1 per week	29	6.9
2 times per week	13	3.1
≥ 3 times per week	26	6.2
Smoking behaviour		
None	395	93.6
Previous smoker	14	3.3
Current smoker	13	3.1
Previous Medical history of MSDs		
No	357	84.6
Yes	65	15.4
Previous Medical history of systemic illness		
No	379	89.8
Yes	43	10.2

Table 1. Working environment conditions of workers among garment factories, in Galan City, East Ethiopia, Apr 2015

Variables	Number=422	Percent (%)
Job satisfaction		48.3
None	204	44.3
Satisfied	187	7.4
Very satisfied	31	
Repetitive work		3.1
None	13	22.7
Sometimes	96	27.7
Often	117	46.5
Always	196	
Doing too much work		1.9
Never	8	29.1
Sometimes	123	21.6
Often	91	47.4
Always	200	
Availability of sufficient light		87.9
Yes	371	12.1
No	51	
Adjustable chair		27.3
Yes	115	72.7
No	307	

Table 4. Organizational factors of workers among garment factories, in Galan City, East Ethiopia, Apr 2015

Variables	Number=422	Percent (%)
Job satisfaction		48.3
None	204	44.3
Satisfied	187	7.4
Very satisfied	31	
Repetitive work		3.1
None	13	22.7
Sometimes	96	27.7
Often	117	46.5
Always	196	
Doing too much work		1.9
Never	8	29.1
Sometimes	123	21.6
Often	91	47.4
Always	200	
Availability of sufficient light		87.9
Yes	371	12.1
No	51	
Adjustable chair		27.3
Yes	115	72.7
No	307	

The Associated Factors for Work-Related LBP: In Table 5 both bivariate and multivariate analysis were displayed to show the correlation and association between the outcome variable with independent variable. The bivariate logistic regression analysis, factors such sex, age, and monthly income, working experience, history of MSDs, repetitive work and working hour were protective and had an association with LBP. Of all covariates that exported to multiple logistic regressions; sex, years of service, medical history

of MSDs and working hour statistically significant with low back MSD. Being female sewing machine operators were protective for the development of low back disorders than males [AOR =0.39, 95% CI, 0.18-0.88]. Those who had longer work experience (6-10 yr) 2.66 times more likely develop low back disorders than had less work experience (1-5 yr). Employees with high work experience (11-15) were 10.65 times more having the chance to develop low back disorders than had 1-5 less work experience in the garment industry.

Those individuals had previous MSDs are 6.60 times the chance to have LBP than those none MSDs with [AOR = 6.60, 95% CI = 2.49-17.45]. Those workers who are work more than 10 h per

day 5.17 times the chance to have developed LBP than workers who engaged in their activities 8 hours per day (Table 5).

Table 5. Association of variables and Work-Related LBP among Workers among Garment Factory, in Galan City, East Ethiopia, Apr 2015

Variables	Yes n(%)	No n(%)	Low Back Pain	
			COR (95%CI)	AOR (95%CI)
Sex				
Male	42(80.7)	10(19.3)	1.00	1.00
Female	232(62.7)	138(37.3)	0.40(0.19-0.82)	0.39(0.18-0.88)
Age(yr)				
<30	187(61.1)	119(38.9)	1.00	
30-39	65(73.0)	24(27.0)	1.72(1.02-2.90)	
40-49	14(87.8)	4(22.2)	2.22(0.71-6.92)	
≥ 50	8(88.9)	1(11.1)	5.1(0.62-41.22)	
Monthly income				
<700	68(49.3)	70(50.7)	0.27(0.11-0.67)	
700-900	181(71.8)	71(28.2)	0.71(0.29-1.72)	
>900	25(78.2)	7(21.8)	1.00	
Work experience in years				
1-5	154(53.0)	116(43.0)	1.00	1.00
6-10	90(76.3)	28(23.7)	2.42(1.48-3.94)	2.66(1.54-4.60)
11-15	10(90.9)	1(9.1)	7.53(0.95-59.87)	10.65(1.23-92.35)
≥ 16	20(87.0)	3(13.0)	5.02(1.45-17.30)	7.15(1.88-27.16)
Medical history of MSD				
No	214(60.0)	143(40.0)	1.00	1.00
Yes	60(92.3)	5(7.7)	8.01(3.14-20.45)	6.36(2.41-16.77)
Repetitive activities				
None	11(84.6)	2(15.4)	1.00	
Sometimes	51(53.2)	45(46.8)	0.20(0.04-0.98)	
Often	66(56.5)	51(43.5)	0.23(0.05-1.10)	
Always	146(74.5)	50(25.5)	0.53(0.11-2.47)	
Working hour per day				
≤ 8	240(63.2)	140(36.8)	1.00	1.00
9-10	19(76.0)	6(24.0)	1.84(0.72-4.75)	2.18(0.79-5.95)
>10	15(88.2)	2(11.8)	4.37(0.98-19.41)	5.17(1.07-24.87)

DISCUSSION

The work-related low back musculoskeletal disorder is highly prevalent in the garment industry; specifically, those employees engaged sewing activities. 64.9% of the workers were developed LBP. That was in line with the study done by Iranian Communication Company [8]. However, it is higher than the self-reported back pain among computer users in Sri Lanka and sewing machine operators in Norway clothing company [12-13].

The employees might be influenced by their employers to work greater than the allowed hours sated by the labor proclamation. Additionally, workers who are working greater than 10 h were 5 times the chance to have LBP than those who work normal hour a day. The length of working hour strongly was associated with the prevalence of low back disorder among sewing

machine operators. This finding exceeds the standard described under Ethiopian labor law which states that the time during which “a worker actually performs work or avails herself/himself for work in accordance with law, collective agreement or work rules shall not exceed eight hours a day or forty-eight hour a week”.

The female sewing machine operators being protective than males to develop back MSDs [AOR=0.39, 95% CI=0.18-0.88]. Research done in other area indicates females workers were more developed than low back MSD than males [14]. The reasons might be due the difference between machines and also male workers had a workload than females in addition to their normal activities. Another reason might be the number of male workers proportion is less than females. Working long years on the same task increases the exposure of LBP. Those employees who had a long work

experience were 2 up to 10 times the chance to develop LBP than those had less working experience. This is in line with the research done in textile industry workers of Sri Bapurao Deshmukh Sut Girni, Wardha [15].

Whereas the prevalence of back pain increased as the number of working hours spent on repeated strenuous physical activities increased [16]. Employees with previous medical history of MSDs had 6.36 times more chance of developing low back disorders than without medical history of musculoskeletal disorders because it aggravates the previous pain when they are engaged in similar tasks.

As a limitation, we could not use ergonomics tools to conduct postural analysis, limitation of literature on the area of topic in developing countries and recall biases might have given vague answer to questions for respondents to easily remember.

CONCLUSION

The magnitude of work-related LBP among garment industry is high. Independent variables like; sex, year of service in garment industry, previous medical history of MSDs and length of working hour per day had strong association with low back pain. However male workers more prone to LBP than female workers in the garment industry this is contradicting idea with research conducted in other similar sectors so further researches required to more investigate. Additionally, we recommend the government, the owner of the companies and other stockholders should focus on the prevention and control of occupational risk factors for work-related LBP in the garment industries.

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