International Journal of Occupational Safety and Health

ISSN: 2091-0878 (Online) ISSN: 2738-9707 (Print)

Original Article

Self-reported low back pain intensity and interferences among three-wheel drivers in Southwest of Ethiopia: A Community-Based Cross-sectional Study

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Date of submission: 20.01.2023
Date of acceptance: 23.07.2023
Date of publication: 10.10.2023

Conflicts of interest: None

Supporting agencies:
This research is funded by Institute of Health, Jimma University. The grant is only for the support of the research which does not cover the fee of publication.

DOI:https://doi.org/10.3126/ijosh.v13i4.51657

ABSTRACT

Introduction: Low back pain is one of the most reported conditions among vehicle drivers. However, there is a paucity of information about low back pain experiences among three-wheel drivers in Ethiopia. This study aimed to determine the low back pain experience among three-wheel drivers in Ethiopia Jimma City, Southwest Ethiopia.

Methods: A Community-based cross-sectional study was conducted from March 1-25, 2020 among 396 samples. Computer generated simple random sampling method was employed to get the required sample. An interviewer-administered questionnaire was used to collect the data. The data was checked for completeness, coded, cleaned and entered into Epi-data version 3.1 and exported to SPSS version 23 for analysis. Data was analyzed using mean and standard deviations for continuous and proportions for categorical variables. Binary and multivariable logistic regression was used to see an association between dependent and independent variables. P-value <0.05 at 95% CI was declared statistically significant.

Results: Of 396 study participants, 26.26% of them had low back pain at any time among which, 73.1% reported pain in the last 24 hours. Regarding pain intensity in 24 hours, the mean ± standard deviation of worst pain was 5.3 ± 2.5. The independent variables significantly associated with low back pain along with their adjusted odds ratio (95% confidence interval) were: age 3.45 (1.98, 6.03), educational status: 1.96 (1.07, 3.59), physical exercise: 0.52 (0.31, 0.86) drinking alcohol: 2.32 (1.22, 4.39) and working hours: 0.32 (0.13, 0.83).

Conclusion: The three-wheel drivers experienced moderate to severe low back pain and moderate to severe functional and emotional interferences. More than half of the participants reported the worst pain experience within 24 hours. Age, educational status, physical exercise, drinking alcohol and working hours were significantly associated with low back pain.

Keywords: Back Pain, Chronic Pain, Low Back Pain, Pain Measurement, Three-wheel drivers

Introduction

Low back pain (LBP) is one of the most significant contributors to years lived with disability,[1,2] a pervasive health problem, unproductiveness, and lack of general well-being.[3,4] It is defined as pain due to the tension or stiffness of muscle between coastal margins and the inferior gluteal folds.[5,6] It can take the form of acute, sub-acute, and chronic pain.[7]

Several factors, such as prolonged sitting, lifting or carrying heavy objects, total body vibration,

and long daily working hours, contributed to the occurrence of LBP.[8-11] Though it is rising, the prevalence of LBP in adolescents is lower than that seen in adults. The lifetime prevalence of non-specific LBP is estimated at 60% to 70% in global north countries, whereas its one-year prevalence is 15% to 45% with an adult incidence rate of 5% per year.[7] Available evidence showed that there is a correlation between LBP and professional driving. A study on young military professional drivers found a correlation between the severity of LBP and driving as a profession.[2]

The subjective nature and complexity of pain make it hard to describe and quantify.[12] In addition, the temporal variability in pain severity during the day or over more extended periods often affects the accuracy of the patient's self-reporting of pain.[13] However, available evidence shows that the severity of pain is commonly measured by assessing pain intensity and its functional consequences.[12,14] Several studies have shown that decreases in pain intensity are significantly associated with patients' reports of improvements in their emotional and physical functioning and of decreasing pain interference.[15,16]

Despite the three-wheel car, also known as "Bajaj taxi",[17] which carries three persons, is the major transportation system within the city and semi-urban areas in Ethiopia, there is a lack of information about three-wheel drivers' general health concerns in general and LBP in particular. Thus, a research study investigating the LBP experiences of three-wheel drivers is crucial. Hence, this study aimed to characterize self-reported LBP experiences of three-wheel drivers regarding pain intensity and pain interference.

Methods

A community-based cross-sectional study was conducted from March 1 to 25, 2020 in Jimma City, Oromia regional state, located 352 km southwest of Addis Ababa, Ethiopia. The city has a total of 2000 public three-wheel transport with 12 big terminal site stations.

Full-time three-wheel car drivers who had at least six months of driving experience and were on duty during the study period were included. Individuals who have LBP but are not related to driving (known LBP before engagement of driving and LBP of traumatic origin) were excluded from the study. We estimated the sample size using a formula for estimating a single population proportion with a margin of error of 5%, a confidence interval of 95%, and by 50% proportion of low back pain among three-wheel drivers. After adding 10% for the non-response rate our final sample size becomes 422.

The list of three wheel plate numbers was taken from the city administration with respective terminal sites. Then three-wheel car plates were randomly selected by a computer-generated simple random sampling method using ran between approaches on an Excel sheet. Proportional allocation of a total sample size to all terminal sites (there were 12 terminal sites: from 2 terminal sites 36 samples each and 35 samples each from the other 10 terminal sites) was done. Data was collected in the era of the COVID-19 pandemic, and we have considered all public safety measures recommended by WHO such as mask on, social distancing, and coughing etiquette.[18]

Data was collected through face-to-face interviews with trained baccalaureate-holder nurses. Height and weight were measured using a stadiometer. Weight was adjusted to the nearest 0.1 kg and height to the nearest 0.1 cm from the participant's head to toe in an upright standing position. Body mass index (BMI) was calculated from the value of weight and height. The data collection tool consisted of socio-demographics, pain intensity, and interferences. A brief pain inventory (BPI) questionnaire was used for pain intensity in the last 24 hours. The questionnaire has four items related to worst pain, least pain, average pain, and pain now (current pain). Each pain intensity scale was measured on an 11-point numeric rating scale from 0-10 where 0 is for 'no pain' and 10 for 'worst over the past 24 hours.[19-20]

Seven items measure the level of interference with function caused by pain (relationship with others, enjoyment of life, mood, sleep, walking, general activity and normal work). Each interference scale was measured on pain on the 11-point numeric rating scale from 0-10, where 0 is for 'no interference' and 10 is for 'complete interference.[19,21] All tools were translated by bilingual professionals to Afaan Oromo and

Amharic and then retranslated back to English. Before the actual data collection, the tools were pretested on 20 samples with similar backgrounds. After completion of the data collection, each questionnaire was checked for completeness and consistency daily.

The data was entered into Epi-data (version 3.1) and exported to Statistical Package for Social Sciences (SPSS) software (version 23) for analysis. Pain intensity and interferences were categorized as mild (0-3), moderate (4-6), and severe (7-10).[22] Pain score of ≥ 4 on a 0-10 numeric rating scale was considered as the threshold for daily suffering.[23]

Descriptive statistics were used to describe the study sample, means and standard deviations for continuous variables, and proportions for categorical variables. Bivariable and multivariable logistic regression was used to see an association between dependent and independent variables. To control the confounding variables' effects, all independent variables with p-values of 0.25 in the bivariable logistic regression were added to the multivariable model. Then, P-value <0.05 at 95%CI was declared statistically significant. In addition, a correlation between pain intensity and interference was also done. Finally, the results were presented by using tables, figures, and statements.

The IRB of the Institute of Health approved the study [IHPEJ/566/2020]**.** Then the statement obtained from the review board was submitted to the municipality of the city and permission to conduct the study was obtained from them. Study participants were also informed that their participation was voluntary and that the choice to participate or not would have no kind of effect on them. All the data obtained in due course were guaranteed confidentiality by excluding names or any other personal identifiers from the data collection sheet.

Results

Out of 422 three-wheel drivers calculated sample, 396 participated resulting in a response rate of 93.8%. Our study participants had almost similar backgrounds with varying socio-economic characteristics. All of them were male with a mean age of 27.94±5.45years. More than half (52%) of the respondents had a habit of doing physical exercise at least once a week that lasted more than 30 minutes. Regarding the employment status of the respondent, more than half (52.3%) works with their private three-wheel car followed by those who rent as the contract in per diem type 110(27.8%) (Table1).

Table 1: Distributions of Socio-economic characteristics of three-wheel drivers (n= 396)

Variable		n (%)
Sex	Male	396 (100%)
Age (In Years)	< 20	30 (7.6%)
	20-30	254 (64.1%)
	31-40	102 (25.8%)
	≥ 41	10 (2.5%)
Educational level	Primary School	60 (15.2%)
	Secondary School	261 (65.9%)
	College and above	75 (18.9%)
Marital status	Single	227 (57.3%)
	Married	163 (41.2%)
	Widowed	6 (1.5%)
Religion	Muslim	130 (32.8%)
	Orthodox	141 (35.6%)
	Protestant	125 (31.6%)
Ethnicity	Oromo	255 (64.4%)
	Amhara	46 (11.6%)
	Kefa	39 (9.8%)

	Yem	17 (4.3%)
	Dewaro	18 (4.5%)
	Gurage	10 (2.5%)
	Wolayita	11 (2.8%)
Average Monthly Income (ETB)	< 1500	51 (12.9%)
	1500-3000	182 (46.0%)
	3001-6000	146 (36.9%)
	> 6000	17 (4.3%)
Body Mass Index (Kg/m^2)	Underweight (<18.5)	28 (7.1%)
	Normal (18.5-24.9)	328 (82.8%)
	Overweight (25-29.99)	36 (9.1%)
	Obese (≥ 30)	4 (1.0%)

Out of 396 study participants, 104 (26.26%) reported lifetime experience of LBP, among which 76 (73.1%) of them reported pain experiences in the last 24 hours. The group-level mean pain intensity was 5.30 (SD: 2.51) for worst pain, 3.80 (SD: 2.04) for least pain, 4.28 (SD: 1.85) for average pain, and 3.68 (SD 2.47) for pain now (at time of the interview) in last 24 hour. More than half, (52.6%) of the participants reported moderate to severe worst pain, and about three-quarters (73.7%) of them reported mild least pain intensity (Figure 1).

As indicated in Table 1 the study participant reported that the LBP interfered with their physical and emotional functions. The highest group interference level was reported in the area of relationships with others, enjoyment of life, and general activity (Table 2).

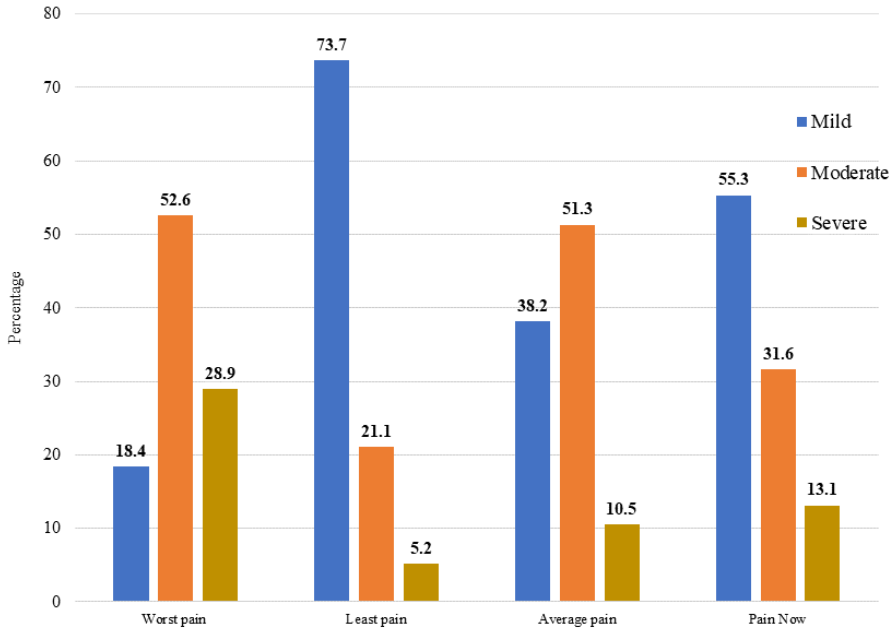

Figure 1: Proportions of pain intensity among three-wheel drivers (mild, moderate and severe)

Table 2: Mean of pain interference of life aspects in the last 24h (n= 76)

Intensity (Last 24 hours) [b]	**Mean and SD**	**SD**
Relationship with others	5.18	2.15
Enjoyment of life	5.35	1.98
Mood	4.18	2.81
Sleep	4.65	2.35
Walking	4.48	2.48
General activity	5.43	1.87
Normal work	3.71	2.69

[b] Numerical scale of variation of 0-10, where 0 does not interfere and 10 is complete interference.

Over one-third (34.2%) of the participants reported mild interference of mood, 60.5% reported moderate interference of walking activity and 28.9% reported severe interference of enjoyment of life (Figure 2).

Regarding the duration of pain, 48.7% of them were in the acute stage, 18.4% were sub-acute, and 32.9% were chronic stage.

Pain intensity parameters (worst pain, least pain. average pain, and pain now) are positively correlated with the pain interference parameters such as enjoyment of life, relation with others, mood, sleep, walking, general activity, and normal work. Worst pain is significantly related to all parameters of pain interference, followed by average pain which is significantly correlated with five pain interference parameters (Table 3).

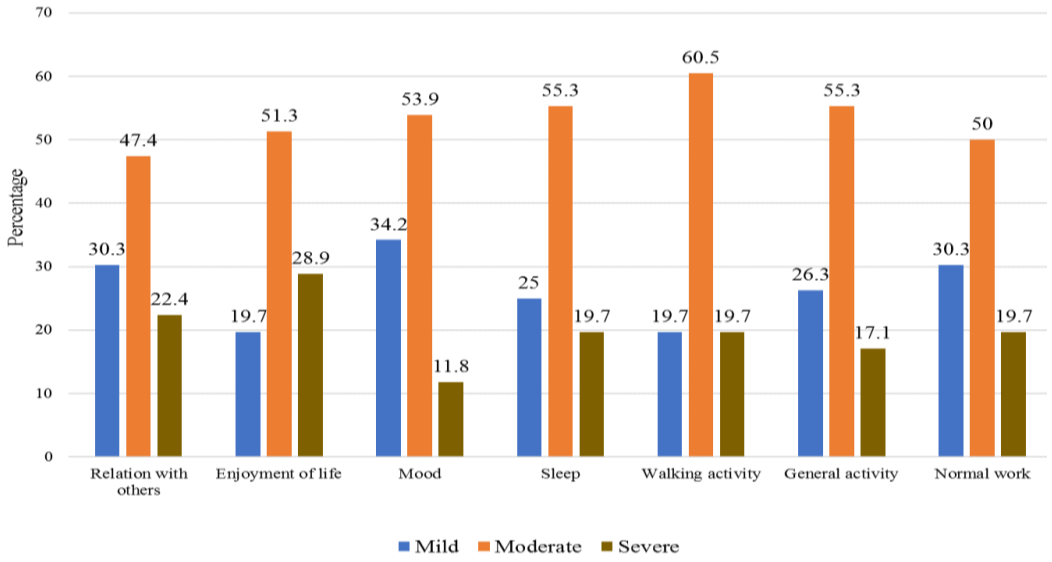

Figure 2 Proportions of pain interference among three-wheel drivers (mild, moderate and severe)

Table 3: Correlation between pain intensity and interferences

Pain severity	**Pain Interferences**						
	Relation with others	Enjoyment of life	Mood	Sleep	Walking Activity	General activity	Normal Work
Worst pain	0.36**	0.39**	0.29**	0.42**	0.31**	0.40**	0.38**
Least pain	0.12	0.35**	0.12	0.218	0.29**	0.22	0.22
Average pain	0.32**	0.31**	0.36**	0.31**	0.19	0.11	0.32**
Pain now	0.24*	0.20	0.17	0.29*	0.17	0.26*	0.33**

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

The study showed that those three-wheel drivers in the age range of 31-40 years were 3 times more likely to develop LBP (AOR:3.45, 95%C. I: 1.98-6.03) compared with those between 21-30 years. Three-wheel drivers who attended college and above were 2 times more likely to have LBP (AOR: 1.96, 95%C.I: 1.07-3.59) compared with those who attended secondary school. The odds of LBP were nearly 48% (AOR: 0.52; 95%C.I: 0.31-0.86) less likely among three-wheel drivers who cease routine physical exercise for at least 30 minutes per week compared to counterparts who had experience doing physical exercise. Respondents who had experiences of drinking alcohol were 2 times more likely to develop low back pain (AOR: 2.32; 95%C.I: 1.22- 4.39) compared to their complements who don't drink alcohol. The study also revealed that the odds of LBP was 68% (AOR:.32;95% C.I: 0.13-0.83) less likely among three-wheel drivers who took

breaks in between their normal working hours for ≥15 minutes per day compared with those who never had working break (Table 4).

Table 4: Multivariable analysis factors associated with Low Back Pain in Jimma, Ethiopia (n=396)

Variables		Lower Back Pain (LBP)		COR (95%C. I)	AOR (95%C. I)	P-Value
		Yes	No			
Age group	≤ 20	2	28	0.27(0.06, 1.17)	0.26(0.06,1.17)	0.079
	21-30	53	201	1		
	31-40	45	57	2.99(1.82, 4.90)	3.45(1.98, 6.03)	0.000
	≥41	4	6	2.53(0.69, 9.28)	2.90(0.71, 11.82)	0.136
Educational level	Primary school	14	46	0.46(0.21, 0.97)	0.68(0.33, 1.42)	0.308
	Secondary school	60	201	1		
	College & above	30	45	0.45(0.26, 0.77)	1.96(1.07, 3.59)	0.030
Habit of doing Physical Exercise	Yes	144	62	1		
	No	148	42	1.52(0.96, 2.39)	0.52(0.31, 0.86)	0.012
Drink alcohol	Yes	38	26	2.23(1.27, 3.90)	2.32(1.22, 4.39)	0.010
	No	224	78	1		
Daily working break	None	6	42	1		
	≥15 minutes	87	194	3.14(0.47, 4.02)	0.32(0.13, 0.83)	0.020
	<15 minutes	11	56	1.37(1.30, 7.66)	0.546(0.26, 1.15)	0.112

Note: COR: Crude Odds Ratio, AOR: Adjusted Odds Ratio, 1: Reference group.

Discussion

The main findings from this study revealed that the three-wheel drivers experienced moderate to severe LBP and moderate to severe functional and emotional interferences. The findings indicated that three-wheel drivers in Jimma City might be exposed to LBP risk factors such as prolonged sitting, lifting or carrying heavy objects, total body vibration, and long daily working hours.[10, 11] The results of the current study may imply that three-wheel drivers are at risk of economic burden, disability, anxiety, and depression related to LBP.[22] The other findings of the current study are the three-wheel drivers experienced varying degrees of intensity and interference levels in the last 24 hours.

This study has shown that three-wheel drivers in the age range of 31-40 years were three times more likely to experience LBP compared to 21-30 age groups which might be due to differences in spinal muscle strength. This is slightly comparable with the study conducted in different areas [24,25]in which younger drivers (mean age 45.0 ± 9.5 years) were in the LBP group.

Pain intensity and interference are essential parameters for the evaluation of the effectiveness of pain[26,27] and reactions to pain-producing activities.[28] In our study participants were asked to rate their pain intensity by using pain 'at its worst', 'least', 'average ', and 'pain now (current pain)' in the last 24 hours. Additionally, they were also asked to rate the pain interferences with seven features of life (relation with others, enjoyment of life, mood, sleep, walking, activity, general activity, and normal work). This is the best way to rate participants' pain severity experiences on an 11 scale based on their reports. Available evidence also supports assessing the pain experiences of an individual by using the two approaches.[29,30] Especially pain intensity is indeed the most clinically relevant aspect of the pain experience irrespective of disease.[31]

The current study showed that the mean worst and average pain was in the moderate to severe

category. This might have affected their daily functional activities and their quality of life. Available evidence shows that pain intensity affects activities of daily living.[23,32-33] Our finding indicated that the worst and average pain intensity scores were more than the threshold which is ≥4. This finding is consistent with previously stated pain severity experience in former studies.[34] In our study, the worst pain correlated with all functional interference scales. It is reported that as the ratings for worst pain increased, pain interference items on the BPI were also rated as impaired, and due to this worst pain is often used clinically as an indicator for treatment.[19] This type of pain often constrains an ability to accomplish daily activities and affects the quality of life.[35]

Based on ratings of ≥4 as the threshold, our study participants experienced considerable pain-related interference in relationships with others, enjoyment of life, mood, sleep, walking and general activity. This finding is in line with the findings of previous similar studies.[36] From this finding we can understand that pain intensity is associated with poor daily functional activities.[37,38] This is because of the nature of chronic pain which cannot be managed as a fixed phenomenon, thereby both the intensity and its periodic nature of pain influence an individual's functional aspects of life.[39] The key message here is that our focus should be on the identification and treatment of the most severe pain that interferes daily functional activities of an individual. Some available studies reported that there is no association between pain severity and pain interference.[38] This might be due to the subjective nature of pain, which means an individual can either overestimate or underestimate the pain at reporting time. Additionally, it could be when low levels of pain intensity are not associated with daily functional activities.

According to this study, the mean of interference scales was moderate in seven functions of life. The findings may help us to decide on a multidisciplinary assessment of pain, and its management and to act on its prevention. The study finding is in line with previously available evidence.[40,41] The implication of this finding shows that early identification and management of pain severity may ultimately decrease the social and economic impact related to it. This study revealed that over one-third of the participants had chronic pain. Hence, it is more of neuropathic pain which occurs due to compression, it results in more daily suffering and greater pain intensity. This finding is similar to previously conducted studies.[42]

This study is community-based and the first report in our setting even in Ethiopia on three-wheel drivers with an adequate sample size. Despite this study having revealed the severity of LBP among three-wheel car drivers in terms of pain intensity and interferences, it is not free from limitation. One of its weaknesses might be over and/or underreporting of their pain experience due to the nature of pain. Another weakness is being crossectional design which is a snapshot at one time. Therefore it is difficult to identify a cause-effect relationship. Recall bias might be another weakness of the study. Thus, in the future, we recommend a longitudinal study design for a better assessment of pain in all dimensions.

Conclusions

The main findings from this study revealed that the three-wheel drivers experienced moderate to severe LBP and moderate to severe functional and emotional interferences. Around half of the participants reported the worst pain experience within 24 hours which is correlated with the seven dimensions of the interference scale. In each interference scale, more than half of the study participants reported moderate interferences in performing all activities except relations with others.

Acknowledgments

We want to thank the data collector and participants for their cooperation in the realization of this research.

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