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Health Related Quality of Life among Cross-Country Truck Drivers with Lower Back Pain: Institution Based Cross-Sectional Study, Ethiopia

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Abstract

Background: Long distance truck driving is a known occupational risk factor for lower back pain, which has a damaging effect on all aspects of health-related quality of life.

Objective: This study estimated the burden of lower back pain and associated health related quality of life among long distance truck drivers.

Methods: A cross sectional study was conducted in April 2018 among a sample of 400 cross- country long distance truck drivers from Djibouti to Ethiopia Mojo Dry Port, to learn the level of health related quality of life using 36-item Short Form (SF-36) questionnaire. Data was analyzed using SPSS window version 21, and a general linear model was used to identify statistical significances in scale scores.

Results: Lower back pain was reported by 260 (65%) truck drivers. The mean global health Related Quality of Life score was 69.6 (SD ± 19.4). The overall Mean Score, the Physical Component Score as well as the Role Physical Score were significantly lower among drivers with lower back pain compared to those without lower back pain at p <0.001. The Global Mean Score and the Physical Component Score were significantly reduced with increased in age and among singles compared to married truck drivers.

Conclusion: Lower back pain is common among long distance truck drivers resulting in reduced Health Related Quality of Life. Increasing age and being single worsened the reduction on Physical Component Score.

Keywords: Ethiopia; Health related quality of life; Lower back pain; Global mean score; Physical component score; Mental component score

Introduction

The traditional concepts of health and functional status have long been transformed and better understood by the measure of quality of life. Measure of quality of life is a multidimensional concept that covers important aspects of physical, psychological, social and spiritual dimensions of life that usually combine and interact in various ways [1]. Health Related Quality of Life (HRQoL) had been defined as individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept influenced in a complex way by the persons' physical health, psychological state, level of independence, social relationships and their relationship to salient features of their environment [2].

Occupational induced Lower Back Pain (LBP) was estimated to cause 21.7 million Disability Adjusted Life Years (DALYs) in 2010, and was among the top ten diseases and injuries that account for the highest number of DALYs worldwide [3-5]. LBP is a common heath condition among truck drivers, and ergonomic as well as psychosocial stressing factors were suggested as risk factors [6-9]. A systematic review done in Nigeria reported a one year prevalence of LBP from 32.5% to 73.5% [10]. An Iranian study reported a prevalence of 78.6% among truck drivers and found work duration, age and BMI as risk factors [11]. In Japan, a prevalence of 50.3% was documented among truck drivers, where irregular duty time, short resting time and long driving time in a day were accounted as predisposing factor [12]. In Sao Paulo 59% of truck drivers had LBP [13], 62.1% in India [14], 64.8% in Ibadan, Nigeria [15], 72.5% among professional truck drivers across five different companies in Nigeria [16], and 88.7% in Dares Salaam [17].

Long distance truck drivers are susceptible not only to physical but also to psychological distress from several injurious conditions that includes accidents, burns, and violent incidents that adversely affect their day to day life events [18]. Several studies have documented that people with various longstanding diseases such as LBP tend to have lower HRQoL [19-25].

Methods

A descriptive cross sectional institution based quantitative study was conducted in 2018 among a sample of 400 cross-country long truck drivers from Djibouti to Ethiopian Modjo Dry Port to determine their health related quality of life. Drivers above 18 years of age who drove for at least one year as full time driver, willing to participate, mentally clear, with no history of crash accident and not in active discomforting pain were invited to participate in a systematic sampling strategy.

Sample size was determined considering the proportions of LBP among cross country long distance truck drivers at 50% as key study parameter, 5% margin of error (d), 95% confidence interval (CI) and 10% upward adjustment for non-response rate.

Instrument

Data on basic socio-demographic, behavioral characteristics and presence of back pain were collected using structured questionnaire in a face-to-face interview. HRQoL was measured using a Short Form Health Survey (SF-36), a validated questionnaire most widely used for measuring HRQoL as it is capable of evaluating both the physical and psychological components of quality of life. These eight dimensions are 'Physical Functioning' (PF with 10 items), 'Role-Physical' which means role limitation due to physical health problems (RP with 4 items), 'Body Pain' (BP 2 with items), and 'General Health' (GH with 5 items) more related to the physical component, 'Vitality/Energy' (VT 4 with items), 'Social Functioning' (SF with 2 items), 'Role-Emotional' which means role limitations due to emotional problems (RE with 3 items), and general 'Mental Health' (MH 5 items). Each domain gets scores ranging from 0 (corresponding to the worst possible state) to 100 (corresponding to the best possible state). Furthermore, the two summary scores: the 'Physical Component Summary' (PCS) that summarizes PF, RP, BP, and GH; and the 'Mental Component Summary' (MCS) score that summarizes VT, SF, RE and MH were calculated.

Data analysis

Descriptive statistics was performed using SPSS version 21 for Windows to summarize the socio-demographic, behavioral as well as presence of LBP of study subjects. HRQoL using the SF-36 values were calculated according to the manual [26-28]. Analysis of Variance test was applied to check variability between the two internally comparable groups (with and without LBP) to control these factors in the model. Difference was considered statistically significant at $P<0.05$ to account for the Bonferroni adjustment. The two groups of patients were compared with regard to HRQoL by overall mean score, two overall Summary Scores, Physical Component Score (PCS) scale and Mental Component Score (MCS) scale, as well as individual domain mean scores. The internal reliability of SF-36 was measured by Cronbach's α coefficient, which ranged from 0.6 to 0.93 for the eight SF-36 dimensions, and for the overall was 0.94.

Ethical considerations

Ethical approval was obtained from Addis Ababa University, College of Health Sciences, School of Public Health Research and Ethics Committee. All respondents were fully informed about the purpose of the study, and verbal informed consent was obtained.

Results

Four hundred male long truck drivers were enrolled in this study with the mean age of 37.7 (SD ± 9) years and average driving experience of 11 years. Married accounted for 53.4% and 77.8% attended formal education up to secondary level. The mean monthly income was 220 (SD ± 91) USD. One hundred twenty-four (31%) habitually smoke cigarette, while 264 (66%) and 139 (34.8%) drink alcohol and chew Chat respectively. Two hundred-sixty (65%) reported to have LBP whereas disease other than LBP was reported by 167 (41.8%), and comorbidity with LBP was reported by 130 (32.5%).

Test of reliability coefficient and internal consistency was carried out for the overall HRQoL score, the two summary scores and all the eight individual dimensions and evaluated by Cronbach's alpha. Cronbach's alpha for the overall HRQoL was 0.94; 0.81 and 63 for PCS and MCS scores respectively. While the Cronbach's alpha was over 0.7 for all individual dimensions, it was 0.60 for Vitality (VT) and Social Function (SF) dimensions. Moreover, item total correlation was acceptably rating at 0.40. The number scoring at the lowest level (floor effects) and the present scoring at the highest level (ceiling) was negligible in almost all items except for RP and RE for the floor and BP, SF and RE for the ceiling which demonstrate that the data from this population was different from the generally well population, indicating the presence of certain compromise in HRQoL.

The overall mean HRQoL score was 69.6 (SD ± 19.4). The highest score 80.6 (SD ± 18.5) was observed with SF dimension whilst the lowest score was 59.7 (SD ± 19.1) with VT of health related quality of life (Table 1). The values of the summary subscales were remarkably reduced on most SF-36 (Table 1).

HRQoL dimensions	Mean (SD)	95% CI	% Floor and 0% celling*(0%)**	Item-total correlation (>0.40)**	Reliability: Cronbach's alpha (>0.70)**
PF	76.3(24.8)	73.8-78.9	2 and 28.8	0.69	0.93
RP	60.2(40.0)	56.4-64.1	21.8 and 41	0.63	0.84
BP	77.3(27.6)	74.7-80.2	0.8 and 45.3	0.65	0.86
GH	63.0(23.5)	60.7-65.4	1.3 and 8	0.71	0.82
VT	59.7(19.1)	57.9-61.5	0.8 and 0.5	0.53	0.6
SF	80.6(18.5)	78.7-82.3	0.8 and 23.5	0.5	0.6
RE	67.8(39.9)	63.7-71.6	19.5 and 53.8	0.59	0.81
MH	72.0(16.7)	70.3-73.6	0.3 and 5	0.6	0.71
PCS	69.2(23.5)	66.8-71.6	0.3 and 5.5	0.87	0.81
MCS	69.9(17.5)	68.3-71.8	0.3 and 0.3	0.82	0.63

Global	69.6(19.4)	67.7-71.6	0.3 and 0.3	0.11	0.94
*Percentage of subjects with worst and best possible score, respectively **desired result					

Table 1: Mean score and mean score difference of HRQoL measures of long track drivers, 2018.

Socio-demographic characteristics	PCS			MCS			Overall all HRQoL		
LBP	**Mean (SD)**	**t-test**	**p-value**	**Mean (SD)**	**t-test**	**p-value**	**Mean(SD)**	**t-test**	**p-value**
Yes	66.4(25.7)	-3.1	0.002*	69.4(17.7)	-0.8	0.42	67.9(20.1)	-2.2	0.021*
No	74.2(19.2)			70.9(17.1)			72.6(17.0)		
Age (year)									
below 37	71.9(22.1)		0.011*	71.2(16.6)		0.151	71.6(18.2)		0.032*
above 37	66.3(25.4)	-2.3		68.7(18.2)	-1.43		67.5(20.3)	-2.1	
Marital status									
Single	65.5(23.5)	-2.12	0.031*	67.5(17.5)	-1.87	0.062	66.6(19.1)	-2.16	0.033*
married									
Education									
Below secondary	68.8(23.7)	0.6	0.54	71.0(17.2)	1.36	0.172	70.4(19.0)	0.99	0.32
Above secondary	68.3(24.3)			68.5(17.8)			68.4(19.8)		
Monthly income									
below 220 USD	70.6(22)	1.2	0.231	70.6(17.2)	0.81	0.411	70.6(18.8)	1.1	0.262
above 220 USD	67.7(25.0)			69.2(17.8)			68.5(19.9)		
Cigarette smoking									
No	70.0(23.6)	1	0.311	70.5(17.5)	0.86	0.382	70.2(19.3)	1.01	0.311
Yes	67.4(24.6)			68.8(17.3)			68.1(19.5)		
Alcohol drinking									
No	68.9(24.7)	0.12	0.9	69.3(17.5)	-0.53	0.591	69.1(19.6)	0.32	0.741
Yes	69.3(23.6)			70.3(17.5)			69.8(19.3)		
Chat chewing									
No	69.6(24.3)	0.64	0.64	70.1(17.5)	0.24	0.801	69.8(19.5)	0.39	0.69
Yes	68.4(23.3)			69.6(17.5)			69.0(19.1)		
Job satisfaction									
No	68.3(24.5)	-0.53	0.591	70.1(18.8)	0.72	0.462	69.5(20.3)	-0.03	0.998
Yes	69.7(23.6)			69.5(16.8)			69.6(18.8)		
* Significant at p-value <0.05									

Table 2: Influence of socio-demographic characteristics and job satisfaction of respondents on HRQoL, 2015.

Independent sample t-test was performed to determine whether the SF-36 HRQoL values for the two summary dimensions and overall HRQoL is influenced by predictor socio-demographic and behavioral characteristics as well as presence of lower back pain among truck

drivers. Consequently, presence of LBP, age, and marital status were found to influence HRQoL of long truck drivers. Those truck drivers with LBP, older than 37 years, and single had significantly lower PCS and overall HRQoL score at p<0.05 (Table 2) compared with their counterparts.

Further analysis was performed to identify which of the eight individual dimensions of the SF-36 HRQoL measure were influenced by those predictor variables that showed significant value with the two summary scores and overall HRQoL score.

LBP and its impact on HRQoL

Compared with those without LBP, long distance truck drivers with LBP had poor quality of life as measured by PF dimension (5.6; 95%CI=5.38-10.7), BP dimension (6.8; 95%CI=6.0-17.1), GH dimension (6.8; 95%CI=2.0-11.6), VT dimension (7.4; 95%CI=3.5-11.2), PCS sub-scale (7.8; 95%CI=2.9-12.6) and overall score (4.6; 95%CI=0.66-9.6) with statistically significant mean difference at p-value<0.05 (Table 3).

HRQoL dimensions	Without LBP		With LBP		p-value	Mean difference	95% CI for the mean diff
	Mean (SD)	95% CI	Mean (SD)	95% CI			
PF	80(20)	75.5-83.2	74.3(26.7)	71.3-77.4	0.031*	5.6	5.38-10.7
RP	64.8(38.2)	58.9-70.9	57.6(41.3)	52.6-62.8	0.932	7.1	-16.58
BP	84(20.4)	81.2-87.9	73.2(29.9)	69.7-77.0	0.000*	11.5	6.0-17.1
GH	67.5(19)	64.2-70.5	60.6(24.9)	57.4-63.4	0.005*	6.8	2.0-11.6
VT	64.5(18.3)	61.5-67.5	57(18.9)	54.8-59.5	0.000*	7.4	3.5-11.2
SF	80(17.9)	76.9-83.0	80.8(18.8)	78.5-83.1	0.701	-72	-7.5
RE	66.1(39.5)	59.8-72.8	68.5(40.1)	63.1-73.2	0.562	-2.39	-16.4
MH	73(17.9)	70.1-75.9	71(16)	69.4-73.4	0.343	1.6	-6.8
PCS	74.2(19.2)	70.8-77.3	66.4(25.7)	63.3-69.5	0.002*	7.8*	2.9-12.6
MCS	70.9(17)	67.9-73.5	69.7(17.7)	67.3-71.4	0.421	3.4	-7.1
Global	72.6(17)	69.4-75.3	67.9(20.4)	65.5-70.4	0.021*	4.6*	0.66-9.6

Table 3: Mean score and mean score difference of HRQoL between respondents without and with LBP, 2018.

Age and its impact on HRQoL

Long distance truck drivers above 37 years had poor HRQoL on PF dimension (4.38; 95%CI=-0.48-9.23), BP dimension (8.59; 95%CI=3.23-13.9), GH dimension (5.96; 95%CI=1.37-10.5), SF dimension (5.33; 95%CI=1.72-8.94), PCS sub-scale (5.62; 95%CI=0.94-10.3) and overall score (1.93; 95%CI=0.27-7.8), compared with those below 37 years of age with significant mean difference at p-value<0.05 (Table 4).

HRQoL dimensions	Age below 37		Age above 37		p-value	Mean difference	95% CI for the mean diff
	Mean (SD)	95% CI	Mean (SD)	95% CI			
PF	78.4(23)	75.1-81.7	74.1(26.2)	70.3-77.7	0.071*	4.38	-9.71
RP	61.9(40.3)	58.8-67.8	58.3(4.5)	52.6-63.9	0.372	3.57	-4.38-11.5
BP	81.5(25.6)	77.8-85.2	72.9(28.8)	68.8-76.9	0.002*	8.59	3.23-13.9
GH	65.9(19)	62.8-68.9	60.6(24.9)	56.6-63.4	0.012*	5.96	1.37-10.5
VT	61.2(18.7)	58.8-63.8	58(19.2)	55.4-60.6	0.091	3.18	-0.55-6.92
SF	83.1(16.1)	81.0-85.5	77.8(20.3)	75.0-80.8	0.004*	5.33	1.72-8.94
RE	66.9(40.2)	51.4-72.7	68.5(39.7)	62.7-74.1	0.701	-1.53	-9.29-6.32
MH	73.4(17.6)	70.9-76.0	70.3(15.6)	68.6-72.6	0.062	3.08	-0.19-6.35
PCS	71.9(22.1)	86.6-75.1	66.3(25.4)	63.0-69.8	0.011*	5.62	0.94-10.3
MCS	71.2(17.2)	68.9-73.7	68.7(18.2)	66.1-71.4	0.15	1.75	-0.92-5.95

Global	71.6(18.2)	68.9-74.3	67.5(20.3)	64.7-70.5	0.031*	1.93	0.27-7.8
* Significant at p-value <0.05							

Table 4: Mean score and mean score difference of HRQoL by age of respondents, 2018.

Marital status and its impact on HRQoL

Long distance truck drivers that were single reported poor HRQoL on RP dimension (10.1; 95%CI=-1.7-18.5), GH dimension (4.17; 95%CI=0.72-9.0), PCS sub-scale (5.4; 95%CI=0.41-10.3) and overall score (4.4; 95%CI=0.10-8.48) compared with married truck drivers with statistically significant mean difference at p-value<0.05 (Table 5).

HRQoL dimensions	Married		Single		p-value	Mean difference	95% CI for the mean diff.
	Mean (SD)	95% CI	Mean (SD)	95% CI			
PF	77.3(52.5)	74.4-80.3	74.2(23.3)	70.3-78.0	0.241	3.07	-10.4
RP	63.5(40.0)	58.5-78.8	53.5(40.4)	46.4-60.0	0.011*	10.11	1.70-18.5
BP	78.6(27.6)	75.2-81.9	74.4(27.8)	69.7-79.0	0.14	4.25	-11.49
GH	64.4(23.9)	61.3-67.2	60.2(22.4)	56.3-63.9	0.09	4.17	0.72-9.07
VT	60.5(18.9)	58.3-62.8	57.9(19.1)	54.8-61.4	0.191	2.64	-7.95
SF	81.2(19.1)	78.9-83.5	79.0(18.8)	76.0-81.9	0.252	2.22	-7.6
RE	69.7(39.6)	65.3-74.5	63.6(40.2)	56.3-70.0	0.142	6.13	-16.59
MH	72.9(16.5)	70.9-74.9	70.0(17)	67.1-72.9	0.101	2.92	-6.97
PCS	70.9(24.1)	68.0-73.8	65.5(23.2)	61.5-69.5	0.031*	5.4	0.41-10.3
MCS	71.1(17.4)	69.0-73.1	67.6(17.5)	64.7-70.5	0.06	3.48	-7.29
Global	71.0(19.3)	64.7-70.5	66.6(19.1)	63.3-69.8	0.033*	4.4	0.40-8.48
* Significant at p-value <0.05							

Table 5: Mean score and mean score difference of HRQoL by marital status of respondents, 2018.

Multiple regression models

Results of the multiple regression analyses predicting PCS, MCS and global score from predictor variables are presented in Table 6. Long distance truck drivers with LBP at p value=0.007, age above 37 years at p value=0.025 and being single at p value=0.006) were negative predictor of PCS. Whereas being single was the only solo negative predictor of MSC reported poor PSC at p value=0.02). On the other hand, old age at p value=0.03) and being single at p value=0.007) negatively predict the overall HRQoL score (Table 6).

HRQoL dimensions	Beta	p-value	95% Confidence Interval for beta	
			Lower bound	Upper bound
PSC sub-scale				
Constant		0	66.41	77.42
LBP	-1.4	0.007*	-12.08	-1.94
Age (year)	-0.14*	0.025*	-11.12	-0.76
Marital status	-0.14	0.006*	2.08	12.16
Education	-0.015	0.76	-5.41	3.96
Monthly income	0.014	0.804	-4.49	5.79
MSC sub-scale				
Constant		0	66.1	74.34
LBP	-0.022	0.67	-4.57	2.94
Age (year)	-1.52	0.12	-6.82	0.85
Marital status	-0.144	0.020*	0.5	7.98
Education	-0.061	0.221	-5.64	1.31
Monthly income	-0.01	0.831	-0.422	3.41
Global HRQoL score				
Constant		0	66.6	75.57
LBP	-0.096	0.063	-8.04	0.21
Age (year)	-0.155	0.038*	-8.68	-0.24
Marital status	-0.138	0.007*	1.57	9.79
Education	-0.037	0.456	-5.26	2.37

Monthly income	0.003	0.954	-4.06	-4.31
* Significant at p-value <0.05				

Table 6: Multiple regression relating PCS, MCS and overall HRQoL score to predictor variables.

Discussion

The aims of this study were to determine the self-reported magnitude of lower back pain and its influence on health related quality of life as measured by the SF-36 among long distance truck drivers. In addition, the possible influence of key socio-demographic and behavioral characteristics of drivers on HRQoL was also examined.

The result of this study indicated that the magnitude of LBP among long distance truck drivers was (65%), which is a lower than 72.5% documented in Nigeria [16], 78.6% in India [11] and 88.7% in Tanzania [14] but higher than that reported, 50%, in Japan [14], 59% in Brazil [13], 60% in the United Kingdom [29], 62.1% documented in India [14].

In this study, the mean PSC score of 69.2(SD=23.5) of truck drivers was similar with the mean MSC score of score 69.9(SD=17.5) and the overall mean score of 69.6(SD=19.4). This indicates that there is no difference in the quality of life from the physical and mental well-being of truck drivers.

There is substantial evidence from previous studies that people with certain disability such as patients with LBP have poor quality of life than the general population. The present study documented the overall HRQoL was 69.6(SD=19.4).

The mean PSC score of 74.2(SD=19.2) was significantly better for those drivers without LBP when compared with those drivers with LBP 66.4 (25.7). Similar significant difference was observed with the overall HRQoL between these groups of drivers. The impact of LBP on the summary measures of SF-36 documented in this study is consistent with that reported among patients with LBP [30,31]. The study done in the US revealed a reduction in HRQoL in all of the SF-36 health domains among patients with chronic pain [32]. In a study done by Ludwig et al. to examine the effects of LBP on HRQoL, the physical dimension was found to be affected the most which is comparable with the finding of this study [33].

Moreover, the study revealed that the overall HRQoL as well as PCS were negatively correlated with increasing age. The finding is consistent with that reported by Rui et al. in their study to evaluate the HRQoL in the population of Shanghai, China [34].

Married truck drivers were also found to have better overall HRQoL as well as PCS than single truck drivers in this study, and this could be due to social support that may reduce psychological distress hence improve the mental dimension of quality of life. This is in agreement with several other studies which have shown that psychological factors have an important role to play quality of life.

Conclusion

The magnitude of lower back pain among long distance truck drivers was high (65%) and drivers with LBP were found to have poor HRQoL. Significantly lower HRQoL was reported among relatively older and single drivers. Presence of LBP, increasing age and being single negatively impact the physical health of cross country long truck drivers more than the mental health component of the HRQoL scores of the SF-36 measure. We recommend a periodic follow up to determine their health status and education on modifiable risk factors and safety procedures should be considered to mitigate the problem.

Limitation of the Study

The possibility of social desirability bias may be considered as a limitation to this study for participants were interviewed upon their arrival to the Dry Port perhaps after taking few hours of long driving with certain degree of fatigue. This may shadow their response for interview questions. As the drivers do not stay long at the Dry Port, we were not able to give them a half to one day rest before conducting the interviews.

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