"Health Related Factors and Disability ofAuto rickshawdrivers in Bangladesh"

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Abstract: *A descriptive cross-sectional study was carried out from January 2014 to December 2014 among 220 auto rickshaw drivers in Dhaka city to determine the level of low back pain & disability. Sampling was done purposively among the auto rickshaw drivers fulfilling the enrolment criteria. Data were collected by face to face interview using pre-tested questionnaire & check list. The age of the respondent's ranged between 25 and 60 years with a mean of 34.95 ± 7.732 years and 45.5% respondents was in 31-40 years of age group. The study showed that 36.4% of the respondent's working period was more than 10 years. The study demonstrated that maximum (62.7%) auto rickshaw drivers reported low back pain and 75.4% had minimal disability and remaining 24.6% had moderate disability and it was calculated by Oswestry Disability Index. The study revealed that not only poor posture and poor ergonomic settings but also age was influencing factors for developed low back pain. The study also demonstrated that low back pain more occurred by aging, more professional working period, daily long working hours, improper sitting posture, daily long driving distance, back bone deformity, previous spinal diseases, back trauma, short resting period. The study found significant association of low back pain with age, working time, working days in a week, deformity, previous diseases (p=<0.05). It was found that association between sitting posture and low back pain was very highly significant (p=<0.001). In this study it was found that low back pain was not associated with BMI, previous accident, seat condition (p=>0.05). From this study it was seen that auto rickshaw drivers with young age, less body weight, less professional working period, straight sitting posture, comfortable seat, less duration of working hours, less driving distance and without back bone deformity had less frequency of low back pain and its related disability. Occupational health and safety management interventions should be implemented to prevent adverse health effects in professional drivers. Training and awareness program for reduction of low back pain should be introduced which would be useful to combat the ill-health of auto rickshaw drivers and subsequently improve their status.*
Key Words: *Rickshaw Drivers, Low Back Pain, Demonstrated, Spinal Disease, Back Trauma, Oswestry Disability Index.*

I. Introduction

Work-related musculoskeletal disorders, especially low back pain, cause substantial economic losses to individuals as well as to the community. Professional drivers have been found to be at high risk for developing LBP due to prolonged sitting and vehicle vibration. Among the different types of work-related musculoskeletal disorders that could potentially be associated with professional driving, LBP has been reported the most extensively. Male truck drivers were four times more likely than sedentary workers to develop a herniated lumbar disk and 80% of motor coach operators have experienced back or neck pain as compared to 50% of non-drivers. Importantly, work-related musculoskeletal disorders in professional drivers are associated with both ergonomic and psychosocial risk factors. The most commonly identified physical factors are prolonged sitting, whole-body vibration, ergonomic mismatch among drivers, the type of vehicle seat, and driving mechanisms. Individual factors such as age, gender, weight, height, body mass index, and general health status are also associated with the work-related ailments of drivers[1]. In a large study of 1449 urban transit drivers, high levels of psychological demands and job dissatisfaction were strongly correlated with reported spinal injuries and

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absenteeism. Psychosocial stress among professional bus drivers might be caused by factors such as difficult traffic conditions, passenger hostility, short lunch breaks, or lack of accessibility to the lavatory. This stress can cause muscle tightness, mechanical strain on spinal structures, and fatigue that could lead to traumatic injury. We did not find any study that directly assessed the association between the psychosocial stressing factors (e.g., difficult traffic conditions and passenger hostility) and LBP in professional auto rickshaw drivers[2]. In a systematical review of the available scientific evidence on the causes of low back pain and the effectiveness of interventions to prevent it, mention two terms that are usually used to describe the phenomenon of low back pain. Low back pain is any back pain between the ribs and top of the leg, from any cause. However, in practice it is often impossible to distinguish back pain caused, by work or from pain of uncertain origin that makes the patient's work impossible to carry out[3]. Low back pain is a one of the most common symptoms throughout the general population, and there have been many discussions of occupational low back pain in particular. There are many reports and monographs regarding low back pain among seated workers, standing workers, truck drivers and those performing heavy labor and so on[4]. In this study, a questionnaire survey was conducted among driver's truck, bus, car, auto and tempo drivers of Pondicherry to determine the actual situation of drivers' low back pain from the perspective of their working conditions[5]. Auto rickshaws are the major means of public transport. Guntur an urban city of Andhra Pradesh around ten thousand people have settled down as auto rickshaw drivers. City is highly populated with most of the roads poorly maintained. Most of the auto-rickshaw drivers are accustomed to accommodating passengers in front cabin due to poor traffic surveillance in the city. They allow the passengers to sit to their left side since the construction of these auto-rickshaws does not permit them to accommodate the passengers to their right. There is extensive literature quoting the fact that motor vehicle drivers (light and heavy vehicle drivers) are vulnerable to work related musculoskeletal disorders due to various factors like postural stress, exposure to vibrations and so on. Professional drivers have a higher prevalence of occupational disorders and disability than other groups[6]. Faulty design of driver's workplace has been identified as a major risk factor responsible for the uncomfortable conditions which operators of motor vehicles are exposed to while driving especially for a long period[7]. In our country context C.N.G based auto rickshaws are not so heavy vehicles and those who drive it vibratory movement not as a main factor development of low back pain. C.N.G based auto rickshaws run in Bangladesh near over 15 years. No study at yet found over C.N.G drivers related to low back pain and disability. Exact cause of low back pain among them may be a new dimension in country prospect. The professional drivers have a higher prevalence of occupational disorders than other occupational groups and neck pain is more prevalent among the bus drivers with long driving hours than in those with short driving hours[8]. A number of studies we found about low back pain in bus drivers all over the world and few in taxi drivers. But no study found about C.N.G based auto rickshaws. So many papers were published related to low back pain but very few its related disability among the drivers. Ergonomics factors such as drivers' seat pans, seat inclination, sitting without lumbar support and bending/twisting during driving were reported to be associated with LBP. In addition, socio-demographic and individual factors such as age, gender, smoking status, sleeping disorders, lack of exercise and general health status were found to be associated with LBP among taxi drivers. History of back injury was found to be an important risk factor for low back pain[9]. Public vehicle drivers showed to have a higher prevalence of MSDs, compared to other careers[10]. Through this study I will find out proportion of low back pain among the auto rickshaw drivers. And also will find out low back pain related disability. This study will help to point out ergonomic factors which cause low back pain. These results may help the drivers to continue their profession with less chance of developing low back pain and thus can avoid disability.

Objectives
a) General objective:
- To assess health related factors and disability of auto rickshawdrivers.
b) Specific Objectives:
- To measure pain, disability among the respondents by Oswestry Low Back Pain Disability Questionnaire Scale.

II. Methodology And Materials

This study was a descriptive type of cross-sectional study. Study was done in four C.N.G stand (Mirpur-11 stand, Banani-11 stand, Tongi station road, Mirpur-10 stand) and two garages (Ibrahimpur garage and Khilgaon garage) in Dhaka city. The study period extends from January 1st to December 31st of 2014. C.N.G based Auto rickshaw drivers not less than 25 years of age were selected as a study population of this study. Sampling was done purposively. Purposively 220 Auto rickshaw drivers from four C.N.G stands and two garages were included in the study with fulfilling the above-mentioned enrollment criteria were included in the study. The study was done through collection of data using questionnaire and neither any intervention nor any invasive procedure was undertaken. However, prior to initiation of the study ethical clearance was taken from

appropriate Ethical Committee. After explaining the purpose of the study to the respondents by the researcher himself and taking verbal consent, data were collected by face to face interview ensuring privacy and confidentiality of the Auto rickshaw drivers. Collected data were checked and verified at the end of work in each day. An interview administered questionnaire was use for data collection. The questionnaire was developed using the selected variables according to the specific objectives. The questionnaire was developed in English and then translated it into Bangla. In this questionnaire in one part also used Oswestry Disability scale for measuring pain related disability. A check list was used for observation, weighing scale for weight and measuring tape for height. Questionnaire was pretested and then finalized after necessary modification according to the findings of pretesting. At the end of each day of data collection, each questionnaire was checked to see whether it was filled completely and consistently. The data entry was started immediately after completion of data collection. Data processing and analyses were done using SPSS (Statistical Package for Social Sciences) version 19. Data were analyzed according to the objectives of the study. The test statistics used to analyze the data were descriptive statistics, Chi square ($\chi 2$). Level of significance was set at 0.05. The results were presented in the form of tables, graphs & chart.

- **Inclusion Criteria**
o Auto rickshaw driver age not below 25years.
- **Exclusion Criteria**
o Working experience less than twoyears.
o Unwilling toparticipate.
o Severely mentallydisoriented.

III. Results

This study was carried out to find out low back pain and disability among the auto rickshaw drivers in Dhaka city. Two hundred and twenty populations were selected for the study. Major proportion of respondents was in age group of 31 to 40 (45.5%) years and below 30 years (35.0%) years whereas around 19.5% respondents was in above 40 years' age group and the age of the respondents ranged between 25 and 60 years with a mean of 34.95 ± 7.732 years and std. Dev. =7.732(Table I). Most of the respondents were can sign only (42.3%) and primary passed (20.9%) whereas some respondents (8.2%) crossed the secondary level. Most of the respondent's income were below 10000 and 10001 to 15000 taka (48.2%) and (47.7%) respectively while only 4.1% respondents earn above 15000 taka only. Majority of the respondents were married (92.3%) and Muslim (98.2%) (Table II). About one third (36.4%) of the respondents driving auto rickshaw for more than 10 years while one fourth of the respondents driving more for 5 years (24.5%) and 10 years (26.4%) respectively. More than half (55.9%) of the respondents works 8 to 12 hours daily. About half of the respondents work 5 days in a week and rest half works for 7 days in a week. About 42.3% respondents cover 100 to 149 kilometers daily (Table III). Figure I: More than sixty percent (64.75%) of the respondents' complaints that low back pain occur after driving while one fourth (26.62%) told during driving and only 8.6% complaints low back pain occur all the time. Among the respondents only 17.7% had previous disease and among them only 15.4% had TB and 10.3% had spinal disease while majority (71.8%) had other diseases such as peptic ulcer, skin disorder, jaundice, asthma etc. Less than half (43.2%) had family history of low back pain and out of them about two-third (72.6%) had low back pain among parents and only 3.2% had among grandparents and 24.2% was in others (Table V). Among the respondents about 39.9% had mild pain and 57.2% had no pain while only 2.9% had moderate pain. Majority of the respondents (60.9%) can take care of themselves without pain. In case of lifting 21.0% respondents Pain restrict heavy lifting but can lift from certain height and 38.4% can lift with some pain while 34.1% respondents can lift things without pain. About 38.4% respondents cannot walk more than 2 kilometers without pain while 42.3% can walk any distance without pain and 15.2% cannot walk more than 1 kilometer without pain (Table VI). Majority (63.64%) of the respondents BMI was in normal range while around one fourth (27.27%) was in overweight and 9.091% of the respondents was in underweight (Figure II). Low back was lower among respondent who had accident (54.8%) than who didn't had (65.8%) accident. Accidents was not significantly associated (p = 0.13) with low back pain (Table VII). BMI was significantly associated with disability of the respondents (p = 0.021). Minimal disability (83.1%) was highest in the normal BMI group while lowest in overweight BMI group (62.7%). On the other hand, moderate disability was highest in overweight BMI group (37.3%) and lowest in normal BMI group (16.9%) while 25.0% auto rickshaw driver had moderate disability among underweight group (Table VIII).

Table I: Distribution of the respondents by age group. (n=220)

Age	Number	Percentage	Mean±SD
30 years and below	77	35.0	
31-40 years	100	45.5	34.95± 7.732
Above 40 years	43	19.5	
Total	220	100.0	

Table II: Distribution of Socio-demographic characteristics of the respondents (n=220)

Characteristics	Number	Percentage
Education		
Illiterate	19	**8.6**
Can sign only	93	**42.3**
Primary	46	**20.9**
Below secondary	44	**20.0**
Secondary	18	**8.2**
Economic status		
10000 and below	106	**48.2**
10001 - 15000	105	**47.7**
15000 and above	9	**4.1**
Marital status		
Married	203	**92.3**
Unmarried	17	**7.7**
Religion		
Muslim	216	**98.2**
Hindu	**4**	**1.8**

Table III: Distribution of Occupational characteristics of the respondents (n=220)

Characteristics	Number	Percentage
Experience of the occupation		
2 years	28	**12.7**
5 years	54	**24.5**
10 years	58	**26.4**
More than 10 years	80	**36.4**
Daily working time		
8 hours	90	**40.9**
8-12 hours	123	**55.9**
more than 12 hours	7	**3.2**
Working days in a week		
5 days	108	**49.1**
7 days	112	**50.9**
Distance covered daily		
50-99 kilometers	28	**12.7**
100-149 kilometers	93	**42.3**
150-199 kilometers	54	**24.5**
200 kilometers and above	45	**20.5**
Part time job		
Yes	14	**6.4**
No	**206**	**93.6**

Table IV: Proportion of low back pain of the respondents (n=220)

Low back pain	Number	Percentage
Present	138	**62.7**
Absent	82	**37.3**
Total	**220**	**100.0**

Figure I: Pie chart shows the occurrence of Low Back Pain (n=220)
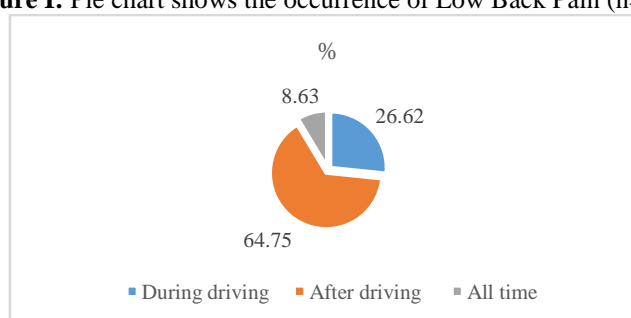
Table V: Disease history of the respondents (n=220)

Characteristics	Number	Percentage
Previous disease		
Yes	39	**17.7**
No	181	**82.3**
Disease		
TB	6	**15.4**
Lung cancer	1	**2.6**
Spinal disease	4	**10.3**
others	28	**71.8**
Total	39	**100**
Family history of LBP		
Yes	95	**43.2**
No	125	**56.8**
Family type		
Parents	69	**72.6**
Grand parents	3	**3.2**
Others	23	**24.2**
Total	**95**	**100**

Table VI: Information related to Oswestry Low Back Pain Disability Questionnaire Scale (n=220)

Characteristics	Number	Percentage
Intensity of pain		
No pain	79	**57.2**
Mild pain	55	**39.9**
Moderate pain	4	**2.9**
Self-care		
Self-care without any pain	84	**60.9**
Self-care with pain	52	**37.7**
Self-care is painful and slow	2	**1.4**
Lifting things		
Lifting without pain	47	**34.1**
lifting with extra pain	53	**38.4**
Pain restrict heavy lifting but can lift from certain height	29	**21.0**
Pain restrict heavy lifting but can lift moderate weight from certain height	9	**6.5**
Walking		
Can walk any distance without pain	53	**38.4**
Cannot walk more than 2 km	64	**46.4**
Cannot walk more than 1 km	**21**	**15.2**

Figure II: Distribution of BMI of the respondents (n=220)
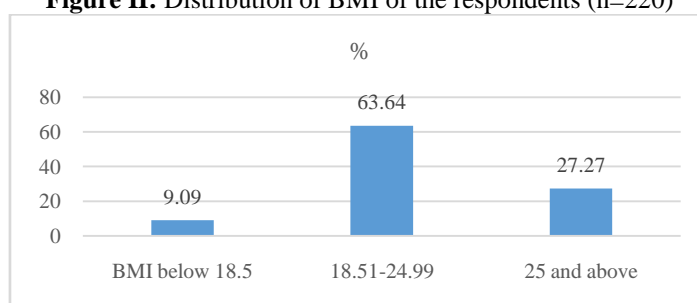
Table VII: Relationship between BMI and low back pain (n=220)

Condition of seat	Low back pain		χ^2	P value
	Present	Absent		
Below 18.5	10 (50.0%)	10 (50.0%)		
18.51- 24.99	83 (59.3%)	57 (40.7%)	5.96	**0.051**
25 and above	45 (75.0%)	15 (25.0%)		
Total	**138**	**82**		

Table VIII: Relationship between BMI and disability(n=220)

BMI	Disability		χ^2	P
	Minimal	Moderate		
Below 18.5	3 (75.0%)	1 (25.0%)		
18.51- 24.99	69 (83.1%)	14 (16.9%)		
25 and above	32 (62.7%)	19 (37.3%)	7.07	0.021*
Total	104	34		

IV. Discussion

This study was carried out to find out low back pain and disability among the auto rickshaw drivers in Dhaka city. Two hundred and twenty populations were selected for the study from four C.N.G stands and two garages. The study was a descriptive cross-sectional study. Results of the present study provide support for our research objectives that was to determine the proportion of auto rickshaw drivers having low back pain, to measure pain disability among the respondents by Oswestry Low Back Pain Disability Questionnaire Scale, to determine the socio-demography of the respondents, to determine occupation related factors among the respondents and finally to find out the percentage of disability among the respondents those who have low back pain. Study shows that proportion of auto rickshaw drivers having low back pain was 62.7%. A study on prevalence of low backache in different occupational group of peoples (rickshaw pullers, housewives, porters, office workers, cultivators) in our country show prevalence of low back pain was 37.40%[11]. Another study on[12] reported 78% of car drivers having complaint of LBP for at least one day during the past 12 months. The study was performed during December 2010 in Dhaka city. A study directly related to auto rickshaw drivers in Guntur city (urban city of India) it was found that 63.66% drivers suffer from low back pain among 300 drivers[6]. In this study the age range of the respondents was 25-60 years with a mean of 34.95 ± 7.732 years. Major proportion of respondents was in age group of 31 to 40 years (45.5%) and 25 to 30 years (35.5%) whereas around 20% was in above 40 years and age group. But result shown that low back pain was highest among age group above 40 years of age (79.1%) and lowest among age group 30 years & below (53.2%). In the study of [12] found that prevalence of LBP was 4.67 times higher for drivers aged more than 40 years compared to drivers of age 25-40 years in Dhaka city. Another study which is contrast with my study in case of age that was the drivers in the LBP group were significantly younger than the drivers in the non-LBP group (mean age 45 ± 9.5 years and 47 ± 10 years, respectively, P =0.04)[1]. Study shows that age was significantly associated (p= 0.019) with low back pain. It is similar to study among the armoured vehicle drivers in Malaysia because there was significant association between age & LBP (χ^2 =6.430; p=0.011)[13]. In this study most of the respondents were can sign only (42.3%) and primary passed (20.9%) whereas some respondents (8.2%) crossed the secondary level. Most of the respondent's income were below 10000 and 10001 to 15000 taka (48.2%) and (47.7%) respectively while only 4.1% respondents earn above 15000 takas only. Majority of the respondents were married (92.3%) and Muslim (98.2%). In this study education and income was not significantly associated with low back pain. A study on[14] shown that there was no significant association of low back pain with socio- demographic characteristics in truck drivers of Sao Paulo, Brazil. But in case of Malaysian vehicle drivers a significant association was found between low back pain and marital status[13]. In this study majority (64.75%) of the respondents' complaints that low back pain occur after driving while one fourth (26.62%) told during driving and only 8.6% complaints low back pain occur all the time. Among the respondents only 28.2% had the history of accident during driving auto-rickshaw and among them only one-fourth (25.8%) complaints that low back pain started after accidents. Accident was not significantly associated (p=0.13) with low back pain in this study. This finding was consistent with a study among the commercial vehicle drivers in Penisular Malaysia where researchers found that the odds ratio for low back pain increased with factors such as previous history of accident but no significant association was observed[15]. In this study it was found that proportion of low back pain increased with the increase of working time. Low back pain was highest among respondents who were working above 12 hours (85.7%) and lowest among respondents who were working 8 hours (52.2%) in a day. Working time was significantly associated (p = 0.019) with low back pain. This was in accordance with the study by[6] work experience and working hours (p=0.006) showed a significant positive association with low back pain. In the study[12] found that more than 7 hour/day (8-16 hour/day) increase the risk of occurrence LBP by about 4 times than those who drive 1-7 hour/day among the car drivers in Dhaka city. Study shows that low back pain was higher among respondents who were working 7 days (70.5%) than respondents who were working 5 days (54.6%) in a week. Working days was significantly associated (p = 0.015) with low back pain.[16] reported that drivers have OR of 2.0 for LBP when driving more than 20 hours a week. Porter &Gyi also found that driving more than 20 hours a week for work was associated with a high frequency of low back problems and related sickness absence[5]. Study shows that Proportion of low back pain was higher among the respondents who had the deformity (78.0%) than the respondents who had no deformity (58.2%). Deformity was significantly associated (p = 0.011) with low back pain. A positive clue found from a study (Szeto & Lam, 2007) found that on observed postural deviations such as increased forward head postures, increased kyphosis in

thoracic spine & increased lordosis in the lumbar spine would also fit in with the high prevalence rate of neck & back pain. Study shows that proportion of the low back pain increased with deteriorating the condition of seat of the vehicle. Low back pain was highest among the respondents who had not good (81.0%) seat condition of the vehicle while low back pain was lowest among the respondents who had good (60.5%) seat condition of the vehicle. Condition of seat was not significantly associated (p = 0.19) with low back pain. In this study sitting posture was significantly associated (p = <0.001) with low back pain. Proportion of low back pain was higher among the respondents who sit bending (84.9%) than the respondents who sit straight (48.5%). It is similar to the study of [13] there was significant association between certain ergonomic factors and LBP such as the use of backrest support ($\chi2$=4.371; p=0.037), driving in forward bending sitting posture ($\chi2$=5.074; p=0.024). In this study, proportion of low back pain was highest (75.0%) among the respondents who had BMI 25 & above and lowest (50.0%) among the respondents who had BMI below 18.5% while proportion of low back pain was 59.3% among respondents who had BMI 18.51 – 24.99. BMI was not significantly associated (p = 0.051) with low back pain. Some literature findings were similar to these findings and some were not such as in Nagpur city, India researcher found that BMI $\geq 25Kg/m2$ was significantly associated with low back pain among the Nagpur city drivers[17]. Study shows that low back pain was higher among respondents who had previous disease (76.9%) than lower among respondents who had no previous disease (59.7%). Previous disease was significantly associated (p =0.043) with low back pain. Previous diseases such as family history of low back pain, back trauma, spinal diseases, osteoarthritis, TB, nutritional deficiency etc. act as a contributing factor for develop low back pain. In the study of Nagpur city, India bus drivers it was found that history of low back pain before working as a driver & diseases other than low back pain were significantly associated with low back pain[17]. Study shows that BMI was significantly associated with disability of the respondents (p = 0.021). Minimal disability (83.1%) was highest in the normal BMI group while lowest in overweight BMI group (62.7%). On the other hand, moderate disability was highest in overweight BMI group (37.3%) and lowest in normal BMI group (16.9%) while 25.0% auto rickshaw driver had moderate disability among underweight group. There was extensive literature quoting the fact motor vehicle drivers vulnerable to work related musculoskeletal disorders due to various factors. Professional drivers had a higher prevalence of occupational disorders than other groups. In the study, found most of the similarity with some contradictory findings according to literature.

Limitations Of The Study
It was a descriptive type of cross-sectionalstudy with small sample size, which doesn't reflect the scenario of the whole country.

V. Conclusion And Recommendations
Low back pain is a frequent phenomenon in Bangladesh and as well as all over the world. Sometime low back pain causes physical disability and gives rise to huge costs for the individual and also for the society. This study concluded that drivers with young age, less weight, less professional working period, straight sitting posture, comfortable seat, less duration of working hours, less driving distance and without back bone deformity had less frequency of low back pain and its related disability.

- Occupational health and safety management programs should be implemented to prevent adverse health effect in auto rickshaw drivers.
- In particular, a shortening of the driving time (e.g. a maximum of 8 hours/day) and introduction of appropriate resting areas should be considered.
- The study recommendation obvious need of ergonomic considerations while designing the vehicle and providing ergonomic education for vehicle drivers.
- Training and awareness program should be given to avoid and minimization low back pain among the auto rickshaw drivers

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