PREVALENCE AND RISK FACTORS OF LOW BACK PAIN AMONG COMMERCIAL MOTORBIKE RIDERS IN KATHMANDU VALLEY

Roshani Gautam,[1] Rejina Shrestha[2]

[1]Maharajgunj Nursing Campus, Institute of Medicine, [2]Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu, Nepal

ABSTRACT

Low back pain is a major health problem because of its high prevalence and has a consequence for disability and burden in the use of health services. It has a great impact on an individual's economic productivity and quality of life. Motorbike riders are the vulnerable population for musculoskeletal disorders including low back pain. The objective of the study was to find out the prevalence and risk factors for low back pain among motorbike riders in Kathmandu Valley. An analytical cross sectional study was conducted in 265 commercial motorbike riders in Kathmandu. To collect data, convenience sampling technique and face to face interview was employed by using structured interview questionnaire. Data was analyzed in IBM SPSS software. Descriptive statistics and regression analysis was calculated. The study findings demonstrated that 43.8% of the respondents had low back pain among them 31.1% experienced more than 3 episodes of pain in last year. Similarly, 38% of the respondents had low back pain in last seven days. Low back pain is associated with BMI ($p = 0.004$), duration of commercial motorbike rides ($p = 0.000$), mileage per day ($p = 0.002$) and total riding hour per day ($p = 0.001$). It is concluded that nearly half of the commercial motorbike riders had low back pain in last one year and a significant association was found between low back pain with BMI, commercial motorbike riding duration, riding mileage and riding hour per day. As commercial motorbike riding is a trending business, there should be some government regulations on working hours and other safety measures for the riders.

KEYWORDS

CORRESPONDING AUTHOR

Ms. Roshani Gautam
Assistant Professor,
Maharajgunj Nursing Campus,
Institute of Medicine, TU, Maharajgunj
Kathmandu, Nepal
Email: roshani77gautam@gmail.com
Orcid No: https://orcid.org/0000-0002-6105-1966
DOI: https://doi.org/10.3126/nmcj.v25i2.56048

INTRODUCTION

Work related musculoskeletal pain is progressing to be the major threat to public health and low back pain (LBP) is frequently reported body area with 53% prevalence rate[1] and the main cause of disability adjusted life years i.e. 61.6% of years lived with disabilities.[2] It occurs in people of any age group, cultures, sex and interferes with quality of life and work performance, and is the most common reason for health care consultation.[3] Motorcycles have been an indispensable component of the transport systems in many cities in the Southern and Eastern Asia regions as they are inexpensive, highly accessible, relatively fast mode of transport.[4] In a study done in commercial motorbike riders in Nigeria, revealed 40.7% had low back pain in the last 12 months.[5] Similarly, 22.04% of motorbike riders had experiences low back pain in Vietnam.[4] Since the first wave of COVID-19 pandemic, ride-hailing business are becoming popular in Nepal among passengers to avoid crowded public vehicle and also for freelance work for the riders on a short term basis.[6,7] Commercial motorcycle drivers often work for long hours having quite high exposure to weather conditions, air pollution, failed road conditions, poor posture , carrying heavy loads, noncompliance with traffic safety rule affects their back health.[4,5] Thus, the study aimed to find out the prevalence and risk factors of LBP among commercial motorbike riders in Kathmandu.

MATERIALS AND METHODS

A cross-sectional study was conducted among 265 commercial motor bike riders (*Pathao* and others) in Kathmandu Valley. Sample size was calculated for the infinite population by using the specified absolute precision formula (n=z2 pq/e2) where, z (standard normal variate) = 1.96 at 95% confidence interval, p (prevalence) = 22.04%, q = 1-p = 77.96%, e (allowable error) = 5% with the reference prevalence of low back pain in motorcycle riders in Vietnam.[3] Non probability convenience sampling technique was used to select sample. Data collected after receiving ethical approval from the Institutional Review Committee (IRC) of Institute of Medicine, Kathmandu [Ref. No. 435 (6-11) E²/078/79] and permission from the Pathao Nepal Private limited.

The instrument contains two parts: part one contains questions related to sociodemographic, personal behavioral factors and motorbike ride variables and part two contains questions related to prevalence of the pain. Extensive literature search, consultation with the pain management expert and pretesting of instruments was done for the validation of the instrument. Data was collected by face to face interview by using structured interview questionnaire during the evening period (7:30 to 10:30 pm) which is the peak time for riding request. Highly populated (Chabahil, Koteshwor, Satdobato, Yekantkuna, Kalanki, Samakhusi, Narayangopalchowk) areas were selected randomly from the list of an intersection areas in ring road. At first, commercial riders were identified, explained the purpose of the study. Written informed consent was taken from each participants.

The researcher and one enumerator (BSc Nursing graduates) collected the data between the period of May 3 to June 13, 2022. The riders who had history of back pain and back injury before starting of commercial motorbike riding was excluded from the study. About 15-20 minutes was taken to collect data from each participants. Though there was difficulty to get separate space for interview, the researcher tries to maintain privacy by conducting interview one by one in each setting. They were given full authority to withdraw their participation from the study without any fear. Data were analyzed using IBM SPSS 16. Descriptive statistics (frequency, percentage, range, mean and standard deviation) were used to describe the socio-demographic variables and prevalence of LBP. Regression analysis was done to identify the risk factors for low back pain.

RESULTS

Out of 265 participants (Table 1), majority (n=151, 57.0%) were belong to 20- 30 years of age. In terms of education, 41.9% reported they had higher secondary education, majority (64.9%) of them were married and were *Hindu* (n= 194, 73.2%) followed by *Buddhist* (n=55, 20.8%). Regarding ethnicity, 47.5% identified themselves as *Janajati*, 42.3% as *Brahmin/Chhetri*. Regarding BMI, more than one third (n=105, 39.6%) were overweight.

Regarding their smoking habit, alcohol consumption, rest break in between ride, sleeping habit and exercise (Table 2), two third (66.4%) of the participants were current smoker, 71.7% stated to consume alcohol. Majority (69.8%) reported not taking rest break in between rides, regarding sleeping habit, 95.5% have less than or equal to 8 hours sleep, more than three fourth (77.7%) stated that they did not perform exercise.

Table 1: Socio demographic information of study participants (n=265)		
Variables	**n**	**%**
Age Group (in years)		
<20	3	1.1
20-30	151	57.0
31-40	88	33.2
41-50	19	7.2
>50	4	1.5
Mean ± SD= 30.4 ± 7.2years {19- 58 years}		
Educational status		
Primary level	19	7.2
Secondary level	96	36.2
Higher secondary level	111	41.9
Bachelor and above	39	14.7
Marital Status		
Married	172	64.9
Unmarried	93	35.1
Religion		
Hindu	194	73.2
Buddhist	55	20.8
Christian	10	3.8
Islam	2	0.8
Others	4	1.5
Ethnicity		
Janajati	126	47.5
Brahmin/Chhetri	112	42.3
Dalit	12	4.5
Madhesi	9	3.4
Others	6	2.3
BMI	6	2.3
Under weight	1	0.4
Normal weight	94	35.5
Over weight	105	39.6
Obese	65	24.5

Table 2: Study participants' behavioral characteristics (n=265)		
Variables	**n**	**%**
Smoking		
Smoked	176	66.4
Never Smoked	89	33.6
Alcohol consumption		
Yes	190	71.7
No	75	28.3
Rest break in between ride		
Yes	80	30.2
No	185	69.8
Sleeping habit		
≤ 8 hour	153	95.5
>8 hour	12	4.5
Exercise		
Yes	59	22.3
No	206	77.7

Table 3: Study participants' information related to motorbike riding (n=265)		
Variables	**n**	**%**
Total motorbike riding duration		
≤ 5years	139	52.5
>5 years	120	47.5
Commercial motorbike riding duration		
≤ 12 months	139	52.5
>12 months	126	47.5
Riding hour per day		
≤ 7 hour	152	57.4
>7 hour Mean riding hour (7.79 ±3.0)	113	42.6
Riding speed per hour		
≤ 60 km	208	78.5
>60 km	57	21.5
Mileages per day		
≤ 100 Km	149	56.2
>100 Km	116	43.8

Table 3 represents the information related to duration, speed and mileage of riders. More than half 52.5% of study participants stated riding duration of motorbike for less or equal to 5 years. In terms of commercial motorbike riding, 52.5% stated that they were riding for less or equal to 12 months. Most of the participants (57.4%) reported working for less or equal to 7 hours per day and the mean working hours per day is 7.76± 3.0. More than three fourth (78.5%) reported the riding speed was less or equal to 60 km per hour. In terms of mileages, more than half (56.2%) noted of maintaining less or equal to 100 km mileages per day.

Table 4: Prevalence of low back pain of study participants' (n=265)

Variables	n	%
One-year prevalence of pain		
Yes	116	43.8
No	149	56.2
Episodes of pain in one year (n=116)		
≤ 3 times	80	68.9
> 3 times	36	31.1
Duration of pain in days (n=116)		
< 3days	54	46.6
3-6days	32	27.6
>6days	30	25.8
Severity of pain (n=116)		
Mild pain	64	55.1
Moderate	50	43.1
Severe	2	1.8
Seven days prevalence of pain		
Yes	101	38.1
No	164	61.9
Seven days severity of pain (n=101)		
Mild pain	81	80.2
Moderate pain	20	19.8
Duration of pain in days (n=101)		
≤3days	56	55.4
>3days	45	44.6

Table 4 shows the participants' prevalence of LBP. Less than half (43.8%) said that they had LBP in the last one year. Among them, more than two third (68.9%) stated facing less or equal to three episodes of pain while 31.1% faces more than three episodes of pain in a year. Regarding the duration of pain in terms of days, 46.6% had experienced pain for less than 3 days followed by 3 to 6 days 32 (27.6%) and more than 6 days 30 (25.8%). Similarly, regarding severity of pain, most of study participants (55.1%) had mild pain.

For the experience of LBP in the last 7 days 38.1% had LBP, among them majority (80.2%) stated of having mild pain and 19.8% stated of having moderate low back pain. When they were further asked about the duration of the pain in terms of days, more than half (55.4%) said that the pain lasted for less or equal to 3 days.

Concerning to the risk factors (Table 5), LBP was significantly associated with BMI (p = 0.004). Riders who were overweight and obese were 2.0 times more likely to have LBP than having normal BMI (OR: 2.065; CI: 1.223-3.486). Similarly, LBP was associated with the duration of commercial motorbike ride (p = 0.000). The motorbike riders who rode more than 12 months were 3 times more likely to have LBP than who ride less than 12 months (OR: 3.075: CI; 1.857-5.092). Whereas the LBP

Table 5: Factors associated with low back pain among motorbike riders (n=265)

Risk factors	One year pain prevalence		AOR (95% CI)	P-value
	No (%)	Yes (%)		
BMI				
Normal weight	64 (42.9)	31 (26.7)	2.065 (1.223-3.486)	0.004*
Over weight and obese	85 (57.0)	85 (73.2)		
Total motorbike riding duration				
≤ 5 Years	85 (57.0)	54 (46.5)	1.525 (0.963-2.485)	0.058
> 5 Years	64 (42.9)	62 (53.5)		
Duration of commercial riding				
≤ 12 Months	96 (64.5)	43 (37.0)	3.075 (1.857-5.092)	0.000**
>12 Months	53 (35.5)	73 (63.0)		
Mileage per day				
≤ 100 KM	96 (64.5)	53 (45.6)	2.153 (1.311-3.535)	0.002*
>101 KM	53 (35.5)	63 (54.3)		
Riding hour per day				
≤7 Hour	99 (66.4)	53 (45.6)	2.354 (1.429-3.877)	0.001*
>7 Hour	50 (33.6)	63 (54.3)		

*: p Value Significant ≤ 0.00   ** : p Value Significant ≤ 0.01

was not associated with the total motorbike riding duration (p = 0.058). Likewise, LBP was associated with the motorbike riding mileage per day (p = 0.002). The motorbike who rode more than 100 kilometers per day were 2.1 times more likely to have LBP (OR: 2.153: CI: 1.311-3.535). Similarly, LBP was associated with total riding hour per day (p = 0.001). The motorbike riders who rode more than 7 hours per day were 2.4 times more likely to have LBP (OR: 2.354: CI: 1.429-3.877).

DISCUSSION

This study assessed the prevalence and risk factors of low back pain in commercial motorbike riders. Globally, low back pain is one of the common causes for the Disability Adjusted Life Years (DALYs)[8] and cause for frequent visits to hospital, as well as absence from work and activity.[9] In this study, the prevalence of LBP among commercial motorbike riders in last one year was 43.8%, the result was comparable with the study conducted in Nigeria among commercial motorcyclist that showed 41% experienced LBP.[5] In contrary to the current study findings, the LBP prevalence was higher among motorcyclist student in a university of Pakistan and police officer who rode motorcycle in Poland.[10,11] Similarly, the findings of several published studies reveled the lower prevalence rate of LBP than the finding of present study.[12,4] Additionally, the study was conducted to examine the musculoskeletal disorders among two wheeler riders in India, found that low back region was the highly affected body region among studied population during last 12 months.[13]

In this study, the prevalence of LBP among commercial motorbike riders during last 12 months and last 7 days were 43.8% and 38.1% respectively. This result was inconsistent with that of study conducted in Nigeria in which twelve months prevalence was 30% and last seven days prevalence was 22.0%.[5] The present study showed that prevalence of low back pain for last seven days was less than that during twelve 12 months and this was consistent with findings of the another study conducted in Nepal.[14]

In this study, LBP was significantly associated with BMI (p = 0.004). Riders who were overweight and obese were 2.0 times more likely to have low back pain than having normal BMI. However, there was no association between BMI and LBP in study conducted in other two studies.[5,15] Similarly, the present study revealed that LBP was associated with the duration of commercial motorbike ride (p = 0.001). The

findings are parallel with the findings of the pilot study in USA and in Nigeria.[12,15]

Furthermore, LBP was associated with the motorbike riding mileage per day (p = 0.002). The motorbike who rode more than 100 kilometers per day were 2.1 times more likely to have lower back pain than who ride less than 100 kilometers per day. Similarly, LBP was associated with total riding hour per day (p = 0.001). The motorbike riders who rode more than 7 hours per day were 2.4 times more likely to have LBP than who ride less than 7 hours per day (OR: 2.354: CI: 1.429-3.877). This could be because of decrease in muscle power due to constant posture for >20 minutes which leads to reduced flexibility of joints.[14] This finding consistent with the findings of various studies.[5,10]

In the present study, the prevalence of LBP was assessed through the verbal reporting of the participants, not through any diagnostic investigations. Similarly, BMI was calculated as the verbal reporting of body weight and height by the participants so there may be recall biases. It is recommended for further study to observe other risk factors such as the riding posture, measurement of height and weight of the riders, types of a motorbike, conditions of road.

Based on the findings of the study it is concluded that nearly half of the commercial motorbike riders had LBP during last one year and one third of them had LBP in the last seven days. Significant association was found between LBP with BMI, duration of commercial motorbike riding duration, riding mileage per day and riding hour per day. It is recommended that there should be some government regulations for the working hours and other safety measures for the ride sharing company. The ride sharing company should organize periodic health checkup camps, regular class on riding posture for the maintenance of back health of the riders.

REFERENCES

1. Joseph L, Standen M, Paungmali A, Kuisma R, Sitilertpisan P, Pirunsan U. Prevalence of musculoskeletal pain among professional drivers: A systematic review. *J Occupational Health* 2020; 62: 1-17. https://doi.org/10.1002/1348-9585.12150

2. Briggs AM, Woolf AD, Dreinhöfer K *et al.* Reducing the global burden of musculoskeletal conditions (Perspective). *Bull WHO* 2018; 96: 366-8. doi: 10.2471/BLT.17.204891

3. Keriri H. Prevalence and risk factors of low back pain among nurses in operating rooms, Taif, Saudi Arabia. *Am J Res Commun* 2013; 1: 45-70. Available from [https://citeseerx.ist.psu.edu/document?repid=rep1&type=pd]

4. Truong LT, Tay R, Nguyen HT. Investigating health issues of motorcycle taxi drivers: a case study of Vietnam [Abstract]. *J Transport Health* 2021; 20. https://doi.org/10.1016/j.jth.2020.100999

5. Ogundele OA, Afolabi OT, Fehintola FO, Olorunsola A, Adelosoye A. Prevalence and management practices of low back pain among commercial motorcyclists in Ilesa Southwest, Nigeria. *Sci J Public Health* 2017; 5: 186-91. doi:10.11648/j.sjph.20170503.15

6. Subedi. Kamal. Ride-sharing platforms offers relief to Nepal's urban population. My Republica (Internet). 2021 26th April. Available from https://myrepublica.nagariknetwork.com/news/ride-sharing-platforms-offer-relief-to-nepal-s-urban-population/

7. Pradhan S. The Gig Economy in Nepal. Nepal Economic Forum (Internet) 2021, 16th August. Available from https://nepaleconomicforum.org/the-gig-economy-in-nepal/

8. Vos T, Flaxman AD, Naghavi M *et al.* Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the global burden of disease study 2010. *Lancet* 2012; 380: 2163-96. https://doi.org/10.1016/S0140-6736(12)61729-2

9. Gautam GJ, Gurung L, Shrestha N, Shrestha PS, Neupane S. Prevalence and contributing factors of low back pain among Nurses in Tertiary Level Hospital. *J Gandaki Med Coll Nepal* 2019; 12: 46-52. https://doi.org/10.3126/jgmcn.v12i2.27172

10. Matysiak A, Trybulec B, Wojcik R. Incidence of musculoskeletal disorders in police officers riding motorcycle while on duty. *Medycyna Pracy* 2020; 71: 177-87. https://go.gale.com/ps/i.4051470&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=04655893&p=HRCA

11. Caban MA, Santiago, KM, Louzado FP *et al.* Acute musculoskeletal pain reported among rideshare drivers in the health/safety investigation among non-standard workers in the Gig Economy (H.I.N.G.E.) Pilot Study. *J Occupational Environ Med* 2020; 62: e236-e239. DOI: 10.1097/JOM.000000000000184

12. Anoop GA, Binoosh SA. A study on musculoskeletal disorders among two-wheeler riders of Kerala state. *Kerala State Technological Congress* 2019; 6: 411-8. Available from https://www.researchgate.net/profile/S-A

13. Wójcik R, Trybulec B. Occurrence and intensity of spinal pain in motorcyclists depending on motorcycle type. *Central Eur J Sport Sci Med* 2017; 20: 81-91. DOI: 10.18276/cej.2017.4-09

14. Memon A, Imran A, Aftab S, Nawaz U, Ishaque F. Low back pain among student motorcyclists: a cross-sectional study. *J Dow Univ Health Sci* 2019; 13: 116-20. https://www.jduhs.com/index.php/jduhs/article/view/786/1718

15. Adhikari B, Ghimire A, Jha N *et al.* Factors associated with low back pain among construction workers in Nepal: a cross-sectional study. *PloS One* 2021; 6: 16. https://doi.org/10.1371/journal.pone.0252564