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## Prevalence and exposure to factors associated with low back pain (LBP) among commercial motorcycle riders in south eastern Nigeria

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### Abstract

**Introduction:** LBP is the most common cause of activity restriction and work absence in much parts of the world, putting a heavy financial burden on people. This study aims at determining the prevalence and exposure to risk factors associated with low back pain (LBP) among commercial bike riders within Nnewi-North Local Government Area of Anambra state.

**Methodology:** This was a cross-sectional study that involved commercial motorcycle riders that ply within the four major villages of Nnewi town in Nnewi-North local government area of Anambra state. An interviewer based semi-structured questionnaire was administered to the respondents at their muster points.

**Results:** One hundred and fifty-four riders were recruited and all were male. The prevalence of LBP was 25%. LBP was highest among riders between ages of 26-36years. There was significant association linking age and marital status to low back pain (LBP) with p-values of 0.001 and 0.013 respectively.

**Conclusion:** Our findings suggest that low back pain is very common among this population and has led to both mild, moderate and severe functional disabilities to the riders. This study also demonstrated the exposure of the riders to some risk factors of LBP. Adequate public awareness, education and use of ergonomics would help in the reduction of this problem.

**Keywords:** Low Back Pain; Motorcycle Riders; Exposure; Risk Factors

### 1. Introduction

Low back pain is a prevalent health problem that also happens to be a major source of disability around the world. It is one of the top ten illnesses and diseases that cause the most Disability Adjusted Life Years (DALYs) worldwide [1]. Low back pain (LBP) affects people of all ages, workers and the general population and is a very frequent reason for medical consultations. The prevalence of low back pain has been associated with the type of occupation such as in commercial driving, lifting of heavy equipment that involve poor postures and manual handling [2]. Some other risk factors for LBP

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include high body mass, some physical and psychosocial factors like stress and anxiety, depression and hereditary [3, 4, 5]. The transportation sector has not been spared in the rising prevalence of LBP [6, 7, 8].

Commercial motorcycling commonly called Okada is fast growing in South-Eastern Nigeria, especially in Nnewi where majority of the indigenes and foreigners use it as a means of transportation. It is rare to enter a household without finding a motorcycle there. LBP is the most common cause of activity restriction and work absence in much parts of the world, putting a heavy financial burden on people and families, communities, businesses, and governments are all affected [6]. Many studies have indicated that LBP is highly prevalent among farmers, long truck drivers, bus drivers and taxi drivers [7, 8, 9, 10, 11]. However, few studies have evaluated the prevalence of LBP among commercial motorcycle riders. Motorcycle riding has always been a road safety concern as numerous crashes involving motorcycle riders are being recorded in our A&E departments and subsequently Physiotherapy departments daily. These crashes may lead to amputation, permanent disability or death. We may not rule out the fact that there may be cases where LBP or discomfort experienced by the rider during driving, influenced his postural behavior and concentration thereby endangering him and other road users. Hence this study is important with a long-term objective of improving the quality of life of motor cycle riders and safety of the general public. Therefore, this study aims at determining the prevalence and exposure to risk factors associated with low back pain (LBP) among commercial bike riders within Nnewi north Local Government Area of Anambra state.

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## **2. Material and methods**

### **2.1. Study Location**

Nnewi North is one of the 21 local government areas in Anambra state in the South-Eastern part of Nigeria with Nnewi as its only town. It comprises of four major villages namely: Umudim, Otolo, Uruagu and Nnewi-ichi. It is the second largest and second most populated city in Anambra State with a population of approximately 500,000 people. It is the second most commercial and industrial town in the state, with a transit hub enabling many travelers to travel to many other cities in the country. It has various schools, banks, churches, hotels, malls, markets and hospitals. The main occupation of the indigenes are trading, production, and farming; therefore, they solely depend on agriculture, commerce and entrepreneurship [12]. Nnewi north is commonly known for their deals on motorcycle and vehicle parts and accessories at their popular Nkwo market. Motorcycle is the dominant and most common means of transportation within Nnewi. Often motorcycles are used to ply within the vicinity or ply to other neighboring towns, and at least half of the people in this area has a motorcycle.

### **2.2. Study population**

This consists of commercial motorcycle riders that ply within the four major villages of Nnewi town in Nnewi North Local Government Area of Anambra State. The four major villages are: Nnewichi, Otolo, Uruagu, Umudim.

### **2.3. Study design**

The study was a cross-sectional analytical study

### **2.4. Study material**

An interviewer-based semi-structured questionnaire was adapted according to the objectives of the study. The questionnaire had three (3) sections (sections I-III). Section I was about the respondents' socio demographic profile; Section II covered the respondents' pain assessment; Section III was about the respondents' exposure to risk factors of LBP.

### **2.5. Inclusion Criteria**

Commercial motorcycle riders that ply within the four major villages of Nnewi North Local Government Area and were willing to participate.

### **2.6. Exclusion Criteria**

Commercial riders who do not ply within Nnewi North Local Government Area and those that ply Nnewi North Local Government Area but are unwilling to participate in the study.

## 2.7. Sample size

154 participants were recruited for this study.

## 2.8. Procedure for data collection

The services of research assistants were employed during the field work. Informed consent was sought verbally from the riders. The recruitment script explained the purpose, significance and benefits of the study. The participants were assured of their responses' confidentiality. Participants who couldn't provide all the answers before picking up their passengers were regarded as invalid. LBP was defined as 'pain in the area on the posterior aspect of the body from the lower margin of the twelfth ribs to the lower gluteal folds, that lasts for at least one day, with or without pain referred into one or both lower limbs' [14, 15].

## 2.9. Ethical consideration

This study was approved by the Scientific and Ethics Review Boards of Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi, Anambra State, with an ethical approval number NAUTH/ CS/66/VOL.15/VER. 3/318/2021/336. Informed consent was sought verbally from the riders before the questionnaires were administered.

## 2.10. Data analysis

Data analysis was done using Statistical Package for Social Sciences (SPSS) version 23. For descriptive statistics, frequency and percentage were used to summarize categorical variables, while means and standard deviation were used to summarize continuous variables. For bivariate analysis, Chi square test was used to compare categorical variables.

## 3. Results

One hundred and fifty-four (154) participants met the inclusion criteria. All were male, majority of the respondents 91(59.1%) were high school graduates (SSCE). Of the 154 participants, 124(80.5%) were from Igbo tribe and majority, 139(91.6%) were Christians and 103(66.9%) were married. The socio-demographic characteristics of the respondents' is shown in Table 1 below.

**Table 1** The socio-demographic information of the respondents

Variables	Frequency	Percentages
<b>Age</b>		
15-25	0	0.0
26-36	81	52.5
37-47	57	36.2
48-58	14	9.1
59-69	3	1.9
70 and above	0	0.0
<b>Gender</b>		
Male	154	100.0
<b>Highest Educational qualification</b>		
First School Leaving Certificate(FSLC)	50	32.5
Senior Secondary School Certificate(SSCE)	91	59.1
Bachelor of Science/Arts	9	5.8
None	4	2.6
Married	103	66.9

Single	51	33.1
<b>Ethnicity</b>		
Hausa	15	9.7
Igbo	124	80.5
Yoruba	5	3.2
Others	10	6.5
<b>Religion</b>		
Christianity	141	91.6
Islam	11	7.1
None	2	1.3

The history, frequency and duration of pain among the respondents is represented in table 2 below. Out of the 154 respondents, 144(93.5%) responded having experienced pain in the past 12 months and 39(25.3%) reported having pain on the waist alone. Majority of the participants, 69(44.8%) and 84(54.5%) responded that the pain reoccurred on a weekly basis and lasts between 0-5hours respectively.

**Table 2** The Assessment of Pain among the Respondents

Variable	Frequency	Percentage
<b>Have you ever felt pain within the past 12 months?</b>		
No	10	6.5
Yes	144	93.5
<b>If YES, then on which Part of the body?</b>		
Back	11	7.1
Waist	39	25.3
Legs	4	2.6
Others	27	17.5
Back and Waist	20	13.0
Back, Waist and others	7	4.5
Back, Waist and buttocks	4	2.6
Back, Waist and legs	8	5.2
Waist and Others	6	3.9
Wait. Legs and others	3	1.9
Back, Waist, Buttocks, Legs and Others	10	6.5
Back, Waist, Buttocks, and Legs	5	3.2
No response	10	6.5
<b>Frequency of pain?</b>		
Daily	58	37.7
Weekly	69	44.8
Monthly	17	11.0

No response	10	6.5
<b>Duration of pain?</b>		
Minutes	14	9.1
0-5 hours	84	54.5
6-12 hours	15	9.7
13-19 hours	12	7.8
20hrs-days	19	12.3
No response	10	6.5

Exposures to some factors related to low back pain was represented in table 3. 140 riders reported excessive exposure to cold weather, prolonged sitting on motorcycle and incorrect sleeping posture. 137 reported prolonged sitting and standing at muster point. 118 reported heavy lifting of loads.

**Table 3** The respondents' response to the factors associated with low back pain

Variables	Frequency	Percentage
<b>Exposure to a very cold weather?</b>		
No	2	1.3
Yes	140	90.9
Possibly	2	1.3
No response	10	6.5
<b>Exposure to air condition /draft</b>		
No	46	29.9
Yes	92	59.7
Possibly	6	3.9
No response	10	6.5
<b>Do you have Family members with low back pain?</b>		
No	66	42.9
Yes	71	46.1
Possibly	7	4.5
No response	10	6.5
<b>Motor vehicle accident?</b>		
No	53	34.4
Yes	91	59.1
No response	10	6.5
<b>Sport injuries?</b>		
No	101	65.6
Yes	42	27.3
No response	11	7.1

<b>Do you smoke?</b>		
No	105	68.2
Yes	36	23.4
No response	13	8.4
<b>Prolonged sitting on the motorcycle?</b>		
Yes	140	90.9
Possibly	4	2.6
No response	10	6.5
<b>Prolonged sitting and standing at the muster point</b>		
Yes	137	89.0
No	3	1.9
Possibly	4	2.6
No response	10	6.5
<b>Incorrect sitting posture at home?</b>		
No	4	2.5
Yes	140	90.9
No response	10	6.5
<b>Lifting/moving heavy loads?</b>		
Yes	118	76.6
No	23	14.9
Possibly	3	1.9
No response	10	6.5
<b>Stress during and after work?</b>		
No	9	5.8
Yes	135	87.7
No response	10	6.5
<b>Conflicts at work?</b>		
No	40	26.0
Yes	103	66.9
No response	11	7.1
<b>Incorrect sleeping position?</b>		
No	4	2.5
Yes	140	90.9
No response	10	6.5
<b>Domestic tasks: ironing and others that gets you in poor posture?</b>		
No	49	31.8
Yes	95	61.7
No response	10	6.5

Table 4 below showed the association linking age and marital status to the part of the body the pain was felt by the respondents. Age and marital status were significantly associated with part of the body the pain was felt with a p-value  $\leq 0.05$ .

**Table 4** The Association between Age, Marital status and part of the body the pain was felt by the respondents

	PART OF THE BODY AFFECTED														Chi-square(x <sup>2</sup> )	df	p-value(<0.05)	
	Back	Waist	Legs	Others	Back and Waist	Back,waist and others	Back,waist and buttocks	Back, waist and Legs	waist and others	waist,legs and others	Back,waist,buttocks,legs and others	back,waist, buttocks and legs	No Response	Total				
AGE	15-25	0	0	0	0	0	0	0	0	0	0	0	0	0	118.8	36	0.00	
	26-36	7	15	0	17	12	5	2	4	0	1	10	2	6				81
	37-47	4	13	4	8	8	2	2	2	6	0	0	3	4				56
	48-58	0	10	0	2	0	0	0	2	0	0	0	0	0				14
	59-69	0	1	0	0	0	0	0	0	0	2	0	0	0				3
	70 and Above	0	0	0	0	0	0	0	0	0	0	0	0	0				0
	Total	11	39	4	27	20	7	4	8	6	3	10	5	10				154
Marital Status	Single	6	8	1	10	9	4	0	0	0	7	2	4	51	25.3	12	0.01	
	Married	5	31	3	17	11	3	4	8	6	3	3	6	103				
	Divorced	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Total	11	39	4	27	20	7	4	8	6	3	10	5	10				154

Table 5 below depicts the relationship between the factors associated with low back pain and the duration of the pain. All the factors examined were all statistically significant (P-value  $\leq 0.05$ ).

**Table 5** The association between the respondents' duration of pain and exposure to factors associated with low back pain

Factors associated with low back pain		DURATION OF PAIN							Chi-square( $\chi^2$ )	df	p-value(<0.05)
		Minutes	0-5 Hours	6-12 Hours	13-19 Hours	20 Hours-Days	No Response	Total			
Exposure to a very cold weather	Yes	14	84	15	8	19	0	140	202.4	15	0.00
	No	0	0	0	2	0	0	2			
	No Response	0	0	0	0	0	10	10			
	Possibly	0	0	0	2	0	0	2			
	Total	14	84	15	12	19	10	154			
Exposure to air condition/draft	Yes	12	49	11	3	17	0	92	177.7	15	0.00
	No	1	30	4	9	2	0	46			
	No Response	0	0	0	0	0	10	10			
	Possibly	1	5	0	0	0	0	6			
	Total	14	84	15	12	19	10	154			
Family members with low back pain	Yes	5	43	8	5	10	0	71	165.9	15	0.00
	No	6	38	6	7	9	0	66			
	No Response	0	0	0	0	0	10	10			
	Possibly	3	3	1	0	0	0	7			
	Total	14	84	15	12	19	10	154			
Motor Vehicle Accident	Yes	8	56	7	6	14	0	91	158.5	10	0.00
	No	6	28	8	6	5	0	53			
	No Response	0	0	0	0	0	10	10			
	Possibly	0	0	0	0	0	0	0			
	Total	14	84	15	12	19	10	154			
Sports Injury	Yes	6	16	7	7	6	0	42	154.0	10	0.00
	No	8	68	7	5	13	0	101			
	No Response	0	0	1	0	0	10	11			
	Possibly	0	0	0	0	0	0	0			
	Total	14	84	15	12	19	10	154			
Do you smoke?	Yes	5	20	7	2	2	0	36	124.3	10	0.00
	No	9	62	8	9	17	0	105			
	No Response	0	2	0	1	0	10	13			



	Possibly	0	0	0	0	0	0	0			
	Total	14	84	15	12	19	10	154			
Prolonged sitting on the motorcycle	Yes	14	82	15	12	17	0	140	159.8	10	0.00
	No	0	0	0	0	0	0	0			
	No Response	0	0	0	0	0	10	10			
	Possibly	0	2	0	0	2	0	4			
	Total	14	84	15	12	19	10	154			
Prolonged sitting and standing at the muster point	Yes	14	80	15	11	17	0	137	163.3	15	0.00
	No	0	2	0	1	0	0	3			
	No Response	0	0	0	0	0	10	10			
	Possibly	0	2	0	0	2	0	4			
	Total	14	84	15	12	19	10	154			
Incorrect sitting posture at home	Yes	14	81	14	12	19	0	140	142.2	10	0.00
	No	0	3	0	0	0	0	3			
	No Response	0	0	1	0	0	10	11			
	Possibly	0	0	0	0	0	0	0			
	Total	14	84	15	12	19	10	154			
Lifting /moving heavy loads	Yes	10	65	14	12	17	0	118	162.9	15	0.00
	No	4	16	1	0	2	0	23			
	No Response	0	0	0	0	0	10	10			
	Possibly	0	3	0	0	0	0	3			
	Total	14	84	15	12	19	10	154			
Stress during and after work	Yes	14	78	14	10	19	0	135	158.8	10	0.00
	No	0	6	1	2	0	0	9			
	No Response	0	0	0	0	0	10	10			
	Possibly	0	0	0	0	0	0	0			
	Total	14	84	15	12	19	10	154			
Conflicts at work	Yes	6	64	11	6	16	0	103	152.5	10	0.00
	No	8	20	4	6	2	0	40			
	No Response	0	0	0	0	1	10	11			
	Possibly	0	0	0	0	0	0	0			
	Total	14	84	15	12	19	10	154			
Incorrect sleeping position	Yes	13	82	15	12	18	0	140	142.6	10	0.00
	No	1	2	0	0	0	0	3			

	No Response	0	0	0	0	1	10	11			
	Possibly	0	0	0	0	0	0	0			
	Total	14	84	15	12	19	10	154			
Domestic Ironing tasks:	Yes	8	59	10	8	10	0	95	156.8	10	0.00
	No	6	25	5	4	9	0	49			
	No Response	0	0	0	0	0	10	10			
	Possibly	0	0	0	0	0	0	0			
	Total	14	84	15	12	19	10	154			

#### 4. Discussion

This study assessed the prevalence of low back pain among motorcycle riders within Nnewi North Local Government Area of Anambra State, South-East geographical area of Nigeria. The prevalence of low back pain among commercial motorcycle riders from the study was 25.3%. This is in contrast to the findings by Olorunfemi et al (2017) and Sikiru et al (2010) which was approximately 41% and 73.53% respectively [16,17]. The sample for this study included males between the ages of 26-69 and statistically significant association was noticed between the age of the respondents' and having low back pain ( $p < 0.05$ ). This is comparable with the findings of Olorunfemi et al. (2017) which reported similar age range with similar conclusion that significant statistical associations exist between having low back pain and age of respondents [16]. From this study, majority of the respondents' highest level of education was Senior Secondary School. This is in tandem with a similar study by Ogunsanya et al (2020) who reported similar finding. Because of this level of education it will be much easier to assist them to be better informed on their back health.[18] 93.5% of the participants reported to have felt pain before in their body within the past 12 months. Majority 103(66.9%) of the respondents who reported having pain were married, 25.3% reported to have felt pain in their waist, 17.5% reported other parts of their body as where they felt pain, 7.1% reported their back, 2.6% reported their legs and 13% reported back and waist as the parts of the body they felt the pain. 44.8% of riders reported the frequency of pain as weekly while 37.7% felt pain daily. Majority (54.5%) of the riders reported the duration of pain as 5hours and 12.3% of riders reported pain to last for 20hours to days. LBP was significantly associated with marital status, which is similar to the findings by Jiman (2016) and Ike (2018) [19, 20].

Exposure to a very cold weather as one of the factors associated with prevalence of low back pain, has 90.9% of the respondent affirm to this, and 59.7% to exposure to air condition. Our finding is similar to the findings of Skandfer et al (2014) [22]. 46.1% of the respondent reported to have a family member with low back pain and there was a significant relationship between that and low back pain. This finding is also similar to that of Ganesan et al (2017) [23]. 59.1% have experienced motor vehicle accident, only 27.3% have had sports injuries and 23.4% of the respondents do smoke, which are all significantly associated to duration of low back pain. However, Ogunsanya (2020) stated that their study found history of tobacco use to be statistically associated with risk of developing low back pain [18]. According to McDaniel et al, the relationship between smoking and low back pain may be explained by the possibility that smoking may lead to reduced perfusion and malnutrition of tissues in and around the spine and cause these tissues to respond inefficiently to mechanical stress [24]. The majority of the respondents (90.9%) agreed to sitting on the motorcycle for a prolonged period of time, to taking incorrect sitting and sleeping posture at home respectively, and 89.0% to prolonged sitting and standing at the muster point. This is similar to the findings by Omokhodion et al (2003) that maintaining a sitting position for more than 3-4hours is a significant risk factor [25]. Similar to the findings by Fares et al (2020) that lifting excessive weights can stress on and cause injuries to the muscles of the back and can lead to inter-vertebral disc herniation and damage to the musculoskeletal system, 76.6% agreed to lifting/moving heavy loads [26]. 87.7% stated that stress during and after work increased the pain and conflicts at work was reported by 66.9% of the respondents. This finding is similar to the findings of Choi et al (2021) that stress causes the excess release of cortisol and adrenaline leading to cellular injury or aging and systemic tissue degeneration presenting symptoms including chronic pain [27].

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## 5. Conclusion

Our findings suggest that low back pain is prevalent among this population with varying duration and frequency of the pain. This study also demonstrated the exposure of the riders to some risk factors of LBP. Adequate public awareness, education and use of ergonomics would help in the reduction of this problem.

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## Compliance with ethical standards

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### *Disclosure of conflict of interest*

The authors declare that they have no competing interests.

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### *Statement of informed consent*

Informed consent was sought verbally and written from the riders before the questionnaires were administered.

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