

# PREVALENCE OF LOW BACK PAIN AMONG OCCUPATIONAL MOTORCYCLE RIDERS IN NNEWI, ANAMBRA STATE

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## ABSTRACT

**Background:** Occupational motorcycling has become the mainstay of transportation in most parts of Nigeria.

**Objective:** This study investigated the prevalence of low back pain (LBP) among occupational motorcycle riders in Nnewi, south eastern Nigeria.

**Method:** Data was collected using a 27- item questionnaire adapted from the one used in a previous study. The consecutive non-probability sampling technique was employed in selecting the respondents.

**Results:** Two hundred and sixty nine copies of the questionnaire were completed and returned out of the 270 administered, indicating a 99.6% response rate. The prevalence of back pain was found to be 40.9% and the body part most affected was the low back (79.5%) followed by the upper and mid back pain (10.2% each); 39% of those who reported LBP belonged to the 40 - 49 age group. Only 15% of the respondents who had worked for 1 - 2 years reported LBP. Sitting for long time was the posture identified by most of the respondents as worsening their back pain (33.3%) while standing for a long time was identified by most (66.3%) as relieving their pain. Upright sitting with 90° elbow flexion was reported by most of the occupational motorcycle riders (77.14%) as the most commonly adopted posture during riding. Although 12% of the motorcycle riders had stopped working on some days as a result of the pain; none of them had left the occupation.

**Conclusion:** LBP may be associated with longer duration of occupational riding and with age although at a certain age (50 and above); it was found to decrease.

**Keywords:** Low back pain, Occupational motorcycle riders

## INTRODUCTION

Low back pain (LBP) is a common symptom of musculoskeletal disorder or disorders involving the lumbar vertebra and has been found to have significant impact on functional ability, thereby restricting occupational activities with marked socio-economic repercussions<sup>1</sup>. LBP is one of the most treated disorders in outpatient physiotherapy clinics worldwide<sup>2</sup>, as probably 80% of the population are affected by this symptom at sometime in life<sup>3</sup>. The number of visits to primary care providers as a result of LBP is

second only the number of visits for upper respiratory tract illnesses.

Bad posture plays a significant role in the genesis of the disease<sup>4</sup> and a lot of conditions and factors like prolapsed lumbar intervertebral disc, facet joint arthritis, spinal stenosis, occupation, obesity, muscle strain and unaccustomed activities have been identified as the common causes of LBP. The typical patients report either acute low back pain (lasting less than three months) or chronic back pain (lasting more than three

months without improvement) and fatigue<sup>5</sup>. There may be pain radiating down the leg, suggesting nerve root involvement. The patient's gait, spinal mobility, reflexes, leg length, leg motor strength and sensory perception may be affected<sup>5</sup>.

Motorcycles popularly known as 'okada' are a common sight in this part of the world as a means of transportation. The occupational motorcycle riders make their daily living by transporting people by their motorcycles (which are a two-wheeled motor vehicle without pedal propulsion). The small frames of these vehicles allow them pass between cars as commonly seen during traffic congestion on the roads. This in addition to their ability to take individuals to virtually any destination through even bad terrains probably makes commercial motorcycle riding the commonest and most easily affordable and available means of transportation especially for short distance trips.

There are basically three types of riding postures - cruiser, sports and standard<sup>6</sup>. Of the three, standard is the most neutral, in which the rider is not angled or slung back in any way. The body is upright, the head and eyes are up, looking through the path of travel, the hands rest comfortably on the grips without hyperextension of the arms. The researchers observed that due to variation in manufacturers and design of motorcycles, there are also varied postures adoptable by the riders leading to possible habituation.

Studies on the prevalence of LBP among orthopaedic and intensive care unit nurses<sup>7</sup>; among male physical education teachers<sup>8</sup> and among truck drivers<sup>9</sup> have been reported. This study investigated the prevalence of LBP among occupational motorcycle riders in Nnewi, a commercial city in South East Nigeria, using a 27-item questionnaire adapted from a previous study<sup>1</sup>.

## METHODOLOGY

### Research Instrument

The instrument used was a self-administered questionnaire which is an adaptation of the one used in a related study<sup>1</sup>, and which has been adapted for use by other workers in the area of occupational LBP<sup>10</sup>.

### Research Design, Sample size and Sampling Technique

The study employed a survey design. Two hundred and seventy copies of the questionnaire were administered to occupational motorcycle riders. The consecutive non-probability sampling technique was employed in selecting the respondents from their different zonal offices, terminals and parks (46 in all) in Nnewi, South East Nigeria. The participants in this study were active occupational motorcycle riders who had been involved in the occupation for at least one year. This was to eliminate or reduce the incidence of LBP which could have been as a result of previous occupations. Participation in the study was purely voluntary.

### Procedure

Ethical approval was sought and obtained from the institutional review committee of Nnamdi Azikiwe University Teaching Hospital before commencement of the study. The informed consent of each respondent was obtained via the consent form attached to the research instrument before the questionnaire was administered to each participant.

### DATA ANALYSIS

Descriptive statistics of mean, standard deviation, pie and bar charts was used to represent the data. The chi-square test was used to analyze the influence of age and duration of occupational riding on the occurrence of LBP.

### Results

Two hundred and seventy copies of the questionnaire were distributed out but two hundred and sixty nine were returned, indicating a 99.6% response rate. From the returned copies, we observed that two

hundred and eight respondents were eligible for the study. The results of the study are presented in tables and charts.

The participants in the study were all males, as no female was found to be engaged in this occupation in Nnewi. Table 1 shows that the mean age of the participants was  $37.39 \pm 10.099$  years and that the mean weight and height of the participants were  $71.05 \pm 11.511$ kg and  $170.19 \pm 6.518$  m respectively. Out of the 88 respondents that reported back pain, 79.5% of them had low back pain with 10.2% having upper back pain and another

10.2% having mid back pain (Figure 1). The prevalence of LBP was found to increase with increasing age though there was a decline after a certain age (Figure 2) and with longer duration of occupational riding (Figure 3). Sitting for a long time was indicated as the most aggravating posture (Figure 4) while standing was indicted as the most relieving posture (Figure 5). Figure 6 shows upright sitting with  $90^\circ$  elbow flexion as the most commonly adopted posture for the respondents and Figure 7 shows the same posture as the most commonly adopted posture for respondents with LBP.

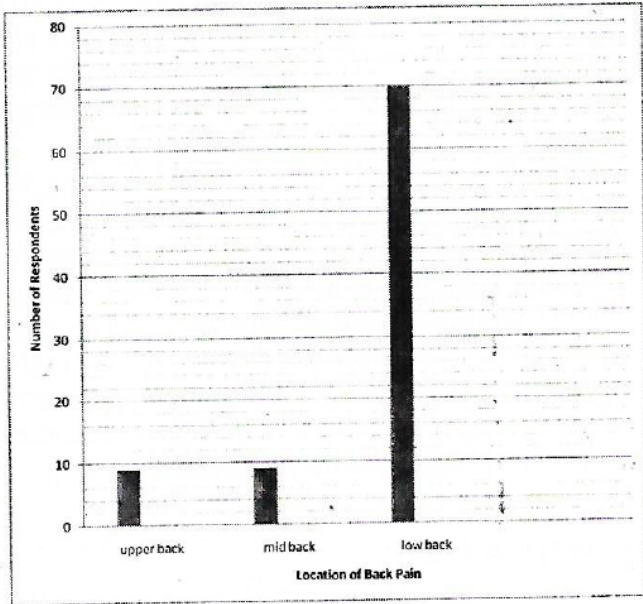
**Table 1: Demographic characteristics of respondents**

Variables	Minimum	Maximum	X + S.D
Age (years)	18.00	76.00	$37.39 + 10.09895$
Weight (kg)	40.00	117.00	$71.05 + 11.51129$
Height (cm)	152.00	192.00	$170.19 + 6.51802$

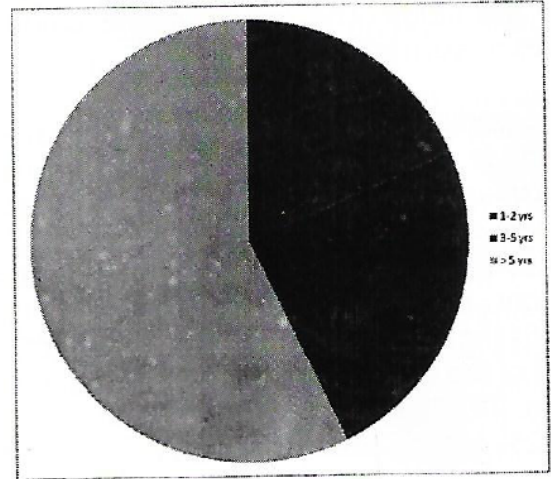
X – Mean  
S.D – Standard deviation

**Table 2: Prevalence of back pain (BP) among respondents**

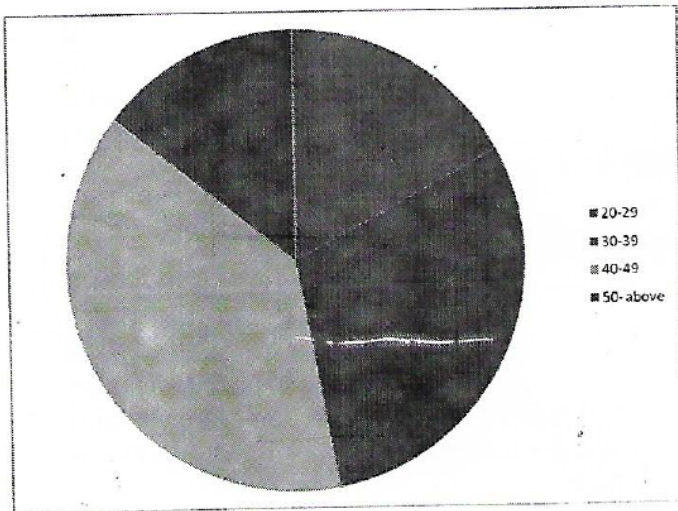
Back pain experience	Frequency	%
No, I have not	123	59.1
Yes, but never any treatment	33	15.9
Yes, but I treated myself	48	23.1
Yes but not serious enough to go to hospital	4	1.9



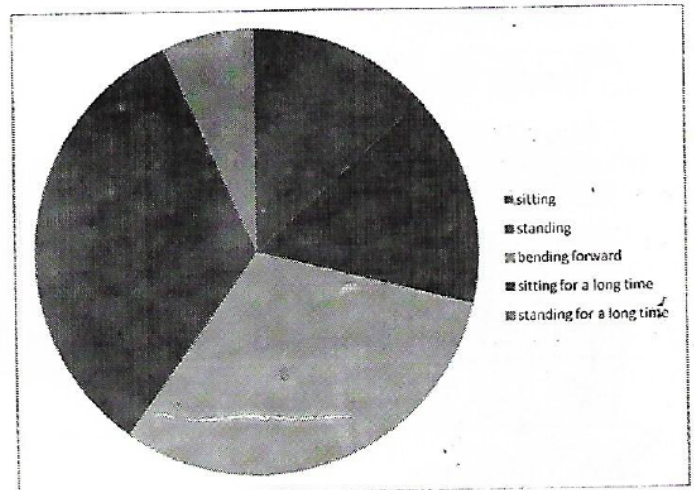
**Figure 1:** Bar chart of location of back pain in respondents



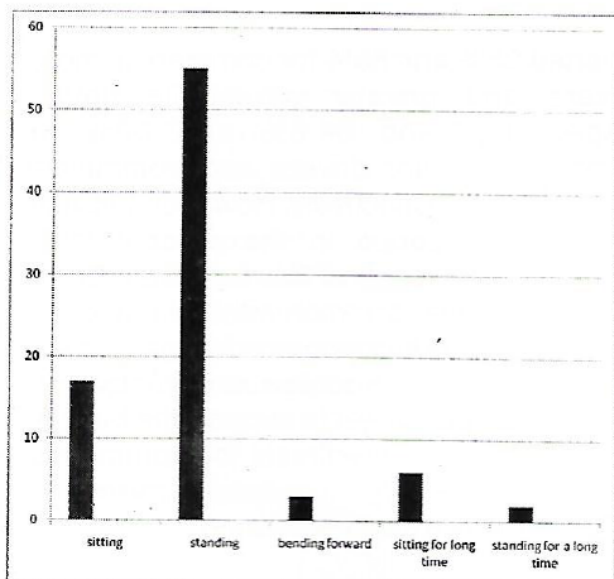
**Figure 3:** Pie chart of prevalence of LBP among respondents with different years of riding experience



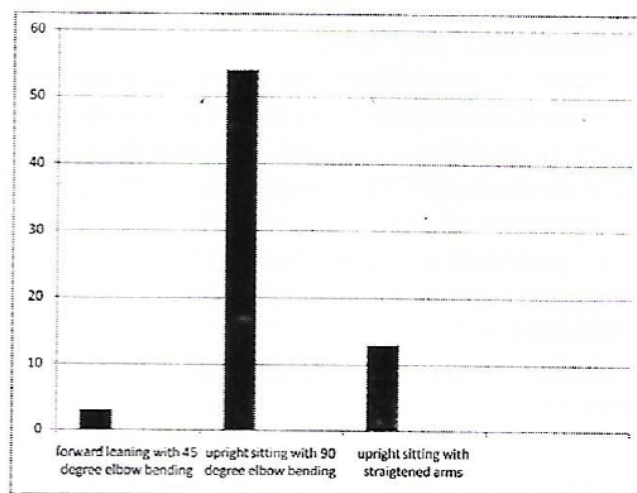
**Figure 2:** Pie chart of prevalence of LBP among different age groups of respondents



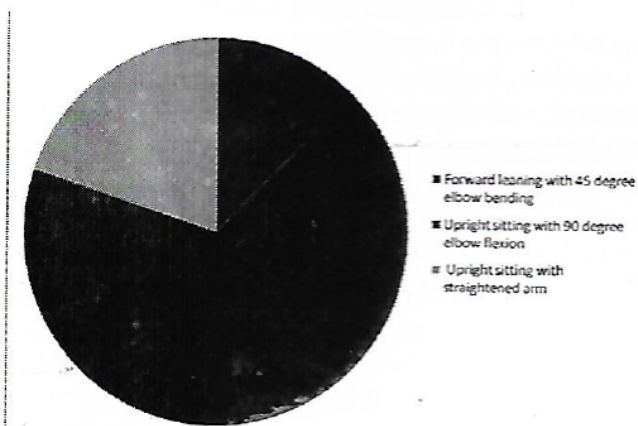
**Figure 4:** Pie chart of the postures that worsen back pain in the respondents



**Figure 5:** Bar chart of the postures that relieve back pain in the respondents



**Figure 7:** Bar chart of postures assumed by the respondents with LBP during riding



**Figure 6:** Pie chart of postures assumed by the respondents during riding

**Table 3: Chi-square table showing the relationship of variables with the occurrence of LBP**

Variable	Chi square	df	P- value
Age	215.7	42	0.000*
Years of riding experience	68.332	2	0.000*

**Key:**

df – degrees of freedom

\* - P-value < 0.05 is significant

## Discussion

The aim of this study was to investigate the prevalence of LBP among occupational motorcycle riders in Nnewi. Two hundred and sixty nine copies of the questionnaire were returned out of the two hundred and seventy that were administered to the respondents giving a response rate of 99.6%. This is similar to the 100% response rate recorded in a similar study<sup>1</sup> but higher than the 84% response rate recorded in a Greek study<sup>11</sup>; and the 74.9% response rate recorded in Lagos, Nigeria<sup>10</sup>. The high response rate was probably due to the fact that the questionnaire was administered and collected on the spot at the various motorcycle parks in Nnewi. Of the two hundred and sixty nine respondents, only two hundred and eight (77.04%) were eligible for the study. This was to eliminate confounding factors such as those who had not ridden for at least a year and those who suffered back pain before they started riding for occupational purposes.

The study involved only males and this is a reflection of the population from which the sample was drawn, as occupational motorcycling in this environment is a male-dominated occupation. It is also consistent with the population in similar studies<sup>1, 10</sup> in which the sampled populations were all males. Out of the 88 occupational motorcycle riders who had back pain, 70 (79.5%) had low back pain, followed by those with mid back pain (9) and upper back pain (9) who both had equal prevalence of 10.2%. The high prevalence of pain recorded in the low back could be because the lumbar spine has a natural resonating frequency of 4-5Hz; and when riding, vibration causes the body to resonate at that frequency<sup>12</sup>. Thus the low back becomes vulnerable to the strains and injuries due to the vibrations of the whole body<sup>1</sup>.

The twelve month prevalence of LBP among occupational motorcycle riders in this study was found to be 54.7%, which is lower than the findings from a similar studies<sup>1, 10</sup> which

reported 96% and 88% for commercial motor drivers and private automobile drivers respectively; and 64.5% and 60% for commercial motor drivers and commercial motorcyclists respectively. However, this high prevalence reported in the present study could be as a result of the bad state of the roads (pot-holes) common within Nnewi or the prolonged periods during which poor postures are assumed by the occupational motorcycle riders without backrest to support the back as occupational motorcycling is the commonest and most easily available mode of transportation in the area.

The present study found that there is a significant influence of age on the occurrence of LBP. This could be as a result of persistent micro-trauma occurring overtime at the posterior longitudinal ligaments with the normal activities of daily living in addition to the prolonged postures adopted by the occupational motorcycle riders. The highest number of respondents fell within the 30 - 39 age group (94 respondents) but the highest percentage of people with LBP fell within the 40 - 49 age group where 27 out of the 75 respondents (36%) in the group reported LBP, followed by the 50 and above age group where 10 out of 32 respondents (31.25%) reported LBP, the 30 - 39 age group where 21 out of 94 respondents (22.34%) reported LBP and the 20 - 29 age group where 12 out of 68 respondents (17.65%) reported LBP. The elastin content of the intervertebral disc which allows it return to its original size and shape after deformation decreases in later life and may be responsible for the high prevalence recorded in the 40 - 49 age group with the corresponding decreases in the other age groups. This could be associated with the fact that the nucleus pulposus of the intervertebral discs starts losing the water-binding capacity which enables it retain its shape with age, thereby reducing its resiliency<sup>3</sup> after the first two decades and would have reached its peak at the fourth decade of life, so that from the fifth decade only the residual effects from the years of active damage may actually

responsible for the pain experienced by those in the 50 and above age group from accumulated microtrauma and chronic inflammatory changes.

Out of the population of the occupational motorcycle riders who had experienced LBP, the majority were within 40 - 49 age group representing about 38.57% of the population with LBP. They were followed by those within 30 - 39 age group who represented 30.00%, those within 20 - 29 age group representing 17.14% and then those within 50 and above age group representing 10.59% of the population.

Duration of years of occupational riding was also implicated as being significant in the possible occurrence of LBP and was highest in occupational motorcycle riders who have been riding occupationally for more than five years (57.14%) followed by those who have been riding occupationally for between three and five years (24.29%). The lowest prevalence was obtained in those who have been riding occupationally for between one and two years (18.57%). This suggests that the incidence of LBP may be associated with years of occupational riding so that with longer duration of occupational riding, there is increased risk of LBP. This could probably be because the respondents who had been riding for longer durations have had more exposure to stress on the back.

The five common postures commonly identified by the occupational motorcycle riders as worsening the occurrence of their back pain in decreasing order of importance are: sitting for a long time (33.3%), bending forward (31.1%), standing (15.6%), sitting (13.3%), and standing for a long time (6.7%). This could be related to the varying degrees of anterior spinal flexion associated with these postures (McGill et al, 1992). The five common postures identified by the respondents as being able to relieve their pain were: standing (66.3%), sitting (20.5%), sitting for a long time (7.2%), bending forward

(3.6%), and standing for a long time (2.4%). The relative extension associated with these changes in postures could be responsible for the relief of back pain. Upright sitting with forty-five degree elbow bending was reported by 77.14% of the occupational motorcycle riders with LBP as being the posture they assumed while riding; 18.57% reported upright sitting with straightened arms and 4.29% reported forward leaning as the posture assumed during riding.

Despite the high prevalence of LBP in the occupational motorcycle riders, only about 12% of them had been stopped from working on some days as a result of the LBP. The reason for this may not be unconnected to the fact that the majority of the respondents are the breadwinners of their families and the poor socio-economic status of these respondents has left them no option but to continue to work despite of the pain they suffer since their lack of formal education and skills acquisition may make it quite difficult for them to seek alternative employment.

## CONCLUSION

This study has shown a high prevalence of back pain among occupational motorcycle riders in Nnewi (79.5%) which may have been influenced by age, and years of occupational riding. It also shows that there is higher occurrence of LBP but lower occurrence of upper back pain among occupational motorcycle riders seen in Nnewi.

## APPRECIATION

We would like to express our profound gratitude to all those who participated in this study. We thank the Chairman of the Motorcycle Riders Union in Nnewi and his executive committee for giving us all the support and assisting in mobilizing their members. Most importantly we thank all the commercial occupational motorcycle riders (okada riders) for their cooperation and willingness to participate in the study.

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## APPENDIX

## QUESTIONNAIRE

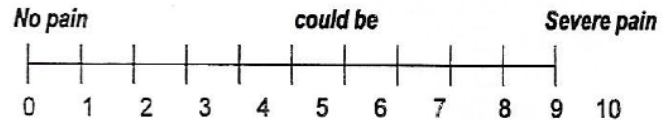
## SECTION A: DEMOGRAPHIC DATA

(Please indicate your answer in the box or space provided as appropriate)

1. Age (as at last birthday)
2. Sex: Male  Female
3. Weight (kg)
4. Height (m)
5. Marital status: single  married   
separated  divorced

## SECTION B: GENERAL QUESTIONS ON BACK PAIN

6. Have you felt pain in your back in the last 12 months?
  - a. No, I have not
  - b. Yes, but never any treatment
  - c. Yes but I treated myself
  - d. Yes, and serious enough to require going to hospital
7. Where is the location of your back pain?
  - a. Low back
  - b. Mid back
  - c. High back
8. How long have you had the back pain?
  - a. Before you started riding
  - b. After you started riding
  - c. Not applicable
9. How many episodes of back pain have you had in the past 12 months?
  - a. 1
  - a. 2-5
  - b. Greater than 5
10. How did the back pain start?
  - a. gradually
  - b. suddenly
11. Do you have pain in your back now?
  - a. Yes
  - b. No
12. How do you rate the level of your pain? (please indicate the severity of the pain experienced by using the numbers below.)



13. What is the nature of the pain you normally have?
  - a. Sharp pain
  - b. Dull pain
  - c. Dull ache
14. Have you ever been involved in a road traffic accident?
  - a. No, I have never
  - b. Yes, but not serious enough to stop me from working
  - c. Yes and serious enough that I was hospitalised

## SECTION C: EFFECTS OF MOTORCYCLING ON THE BACK

15. Are you registered with any transport trade union?
  - a. Yes
  - b. No
16. How long have you been riding for commercial purpose?
  - a. Less than 1 year
  - b. 1-2 years
  - c. Greater than 2-5 years
  - d. Greater than 5 years
17. How long do you work in a day?
  - a. Greater than 2 hours
  - b. 2-5 hours
  - c. Greater than 5 hours
  - d. 6-9 hours (half a day)
  - e. More than 9 hours (full day)
18. Has back pain ever stopped you from working?
  - a. Yes
  - b. No

19. Do you attribute your back pain to the nature of work you do?

- a. Yes
- b. No
- c. Can't tell

20. What posture usually makes your back pain worse?

- a. Sitting
- b. Standing
- c. Bending forward
- d. Sitting for a long time
- e. Standing for a long time

21. What postures usually give relief to your pain?

- a. Sitting
- b. Standing
- c. Bending forward
- d. Sitting for a long time
- e. Standing for a long time

22. What type of motorcycle do you ride?

- a. Wide hand
- b. Narrow hand

23. Would you consider the posture you assume when riding adequate?

- a. Yes
- b. No

24. What factors make your back pain worse?

- a. When putting the motorcycle to start
- b. When helping to carry load while on the motorcycle
- c. The vibrations of the motorcycle
- d. Others please state \_\_\_\_\_

25. From the pictures below what picture corresponds to the position you assume while riding?



26. When do you normally have the back pain?

- a. It is there all the time
- b. When I sit to ride
- c. When I wake up in the morning
- d. After the day's work in the evening

27. Would you attribute your back pain to your sitting posture?

- a. Yes
- b. No

If no, what are the causes of your back pain?

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THANK YOU