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Prevalence of Low Back Pain in a Southern Nigerian Population

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Abstract:- Low back pain is one of the very common health issues faced by most people in their mid-adult years. A worldwide prevalence of low back pain has been reported to be between 30-80%. This study aimed at evaluating the prevalence of low back pain and the factors that may cause or contribute to low back pain in Port Harcourt. A total of 401 subjects, which included 191 females and 210 males were included in the study with age range 20-59 years. The data collected were analyzed using Statistical Package for Social Sciences (SPSS) version 23.0 and percentages, descriptive statistics was used to establish cut-offs and social demographic variables. Categorical variables were analyzed using chi-square test and binary logistic regression summary. The prevalence of low back pain was found to be 48% and the mean body mass index of subjects with low back pain was 25.67. Low back pain was more prevalent among female traders (21.7%), male drivers (20.6%) and overweight subjects (55.7%). There was statistically significant difference between health status ($p<0.01$), posture duration ($p=0.03$) body mass index ($p<0.01$) of subjects and low back pain. No statistical significance was predicted between low back pain and job posture ($p=0.1$), age ($p=0.13$), exercise engagement ($p=0.06$) and sex ($p=0.74$). The point prevalence of low back pain among Port Harcourt residents was 48%, which represents almost half of the study population, indicating that low back pain is a problem faced by the study population and had positive relationship with body mass index, posture duration and health status.

Keywords:- *Prevalence, Low Back Pain, Nigerians, Port Harcourt, Posture, Body Mass Index.*

I. INTRODUCTION

Pain according to [1] is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage. The human back is the large posterior area of the human body rising from the top of the buttocks to the back of the neck and the shoulders [2]. Low back pain is a pain limited to the region between the lower margins of the 12th rib and gluteal folds [3][4][5][6]. It is a condition of pain, aches, stiffness or fatigue located at the lumbosacral region of the spine [7]. It is also described as episodes of pain, stiffness or discomfort people experience in the lower back [8]. People with low back pain usually experience huge social, mental and physical disruptions [9]. Low back pain according to Manchikanti, is an important social, clinical, economic and public health problem affecting the entire world [10]. It is not only regarded as the most common reason for functional disability worldwide, but also estimated to affect about 90% of the general population [11]. Significant restrictions on usual activities and participation can be a manifestation from low back pain [12].

II. MATERIALS AND METHOD

A cross-sectional study was carried out in Port Harcourt to evaluate the prevalence of low back pain from January to June, 2016. A total of 401 randomly selected subjects whose ages ranged from 20-59 years, comprising of 210 males and 191 females Nigerians residing in Port Harcourt were considered in this study. A Dutch musculoskeletal Questionnaire on low back pain was used in the study [13]. The following information was provided: Socio-demographic data which includes; age, sex, weight and height. Questions about occupation and health were also provided in the questionnaire.

Anthropometric measurement of weight and height were taken to determine the body mass index. Descriptive statistics of mean and standard deviation was used to establish cut-offs and social demographic variables were also analyzed. Categorical variables were analyzed using chi-square test and binary logistic regression summary. The occupation of participants were also grouped and compared with the prevalence of low back pain. All these were analyzed using Statistical Package for Social Sciences (SPSS) version 23.0.

III. RESULT

401 subjects comprising of 210 (52%) male and 191 (48%) female, were considered for the study. 48% of the subjects experienced low back pain while 52% did not experience low back pain. 53% of the male population experienced low back pain while 47% of the female subjects experienced low back pain. The individuals involved in the study engaged in 14 occupations as shown on Table 1, the highest proportion was observed amongst students (22.4%), followed by traders and drivers (8.2% respectively) and the least proportion was observed amongst the secretaries (3%). The prevalence of low back

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pain was 48% and was more prevalent amongst students (18%) and less prevalent amongst secretaries (3.1%). Low back pain was more prevalent among male drivers (20.6%) and less prevalent among male secretaries (1.9%). It was more prevalent among female traders (21.7%) than female civil servants (0.0%) as shown in Table 2.

Low back pain was highly prevalent among overweight subjects (55.7%) and less prevalent among class III obese subjects (0.5%) as shown in table 3. Body mass index was statistically significant ($p<0.01$) with low back pain as shown in table 4. The mean body mass index of subjects with low back pain was 25.67 (Table 5). No significant association was predicted between job posture and low back pain (Table 7).There was a significant difference between health status and low back pain ($p<0.01$). Low back pain was highly prevalent (43.3%) among individuals between the ages of 30-39 and less prevalent (1.4%) among individuals between the ages of 50-59. The association of age with low back pain was not statistically significant. 32.7%. A high prevalence (73.7%) of low back pain was observed among individuals who do not engage in exercise and less prevalent (26.3 %) among those who engage in exercise. The binary logistic regression summary did not predict any association with the outcome of low back pain ($p=0.06$, Table 7).

Occupation	Frequency	Percentage (%)
Bankers	30	7.5
Civil Servants	17	4.2
Cleaners	22	5.5
Doctors	27	6.7
Drivers	33	8.2
Engineers	16	4.0
Entrepreneurs	15	3.7
IT Experts	15	3.7
Nurses	28	7.0
Secretary	12	3.0
Security	32	8.0
Students	90	22.4
Teachers	31	7.7
Traders	33	8.2
Total	**401**	**100**

Table 1:- Showing the distribution of the subjects according to occupation

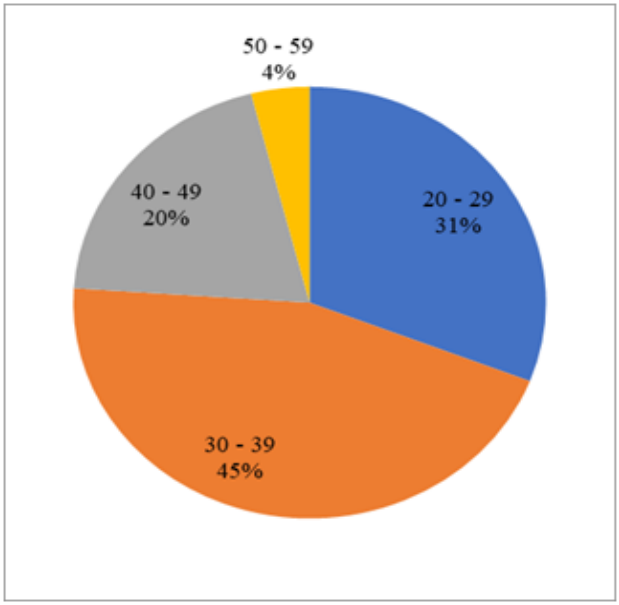

Fig 1:- Showing age distribution of the subjects

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		Presence of Low Back Pain								
Occupation		***Male***			***Female***			***Total***		
		Yes	***No***	***N***	***Yes***	***No***	***N***	***Yes***	***No***	***N***
Bankers	Count	8	6	14	5	11	16	13	17	30
	%	7.8	5.6	6.7	5.4	11.1	8.4	6.7	8.2	7.5
Civil Servants	Count	11	4	15	2	0	2	13	4	17
	%	10.8	3.7	7.1	2.2	0.0	1.0	6.7	1.9	4.2
Cleaners	Count	0	3	3	8	11	19	8	14	22
	%	0.0	2.8	1.4	8.7	11.1	9.9	4.1	6.8	5.5
Doctors	Count	4	9	13	6	8	14	10	17	27
	%	3.9	8.3	6.2	6.5	8.1	7.3	5.2	8.2	6.7
Drivers	Count	21	11	32	1	0	1	22	11	33
	%	20.6	10.2	15.2	1.1	0.0	0.5	11.3	5.3	8.2
Engineers	Count	8	8	16	-	-	-	8	8	16
	%	7.8	7.4	7.6	-	-	-	4.1	3.9	4.0
Entrepreneurs	Count	8	4	12	1	2	3	9	6	15
	%	7.8	3.7	5.7	1.1	2.0	1.6	4.6	2.9	3.7
IT Experts	Count	10	5	15	-	-	-	10	5	15
	%	9.8	4.6	7.1	-	-	-	5.2	2.4	3.7
Nurses	Count	-	-	-	11	17	28	11	17	28
	%	-	-	-	12.0	17.2	14.7	5.7	8.2	7.0
Secretary	Count	0	2	2	6	4	10	6	6	12
	%	0.0	1.9	1.0	6.5	4.0	5.2	3.1	2.9	3.0
Security	Count	9	17	26	1	5	6	10	22	32
	%	8.8	15.7	12.4	1.1	5.1	3.1	5.2	10.6	8.0
Students	Count	18	32	50	17	23	40	35	55	90
	%	17.6	29.6	23.8	18.5	23.2	20.9	18.0	26.6	22.4
Teachers	Count	2	3	5	14	12	26	16	15	31
	%	2.0	2.8	2.4	15.2	12.1	13.6	8.2	7.2	7.7
Traders	Count	3	4	7	20	6	26	23	10	33
	%	2.9	3.7	3.3	21.7	6.1	13.6	11.9	4.8	8.2
Total	Count	102	108	210	92	99	191	194	207	401
	%	100	100	100	100	100	100	100	100	100

Table 2:- Showing the Prevalence of low back pain among individuals involved in various occupations
N = amount

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		Presence of Low Back Pain								
BMI categories		***Male***			***Female***			***Total***		
		Yes	***No***	***N***	***Yes***	***No***	***N***	***Yes***	***No***	***N***
Underweight	Count	4	14	18	4	6	10	8	20	28
	%	3.9	13.0	8.6	4.3	6.1	5.2	4.1	9.7	7.0
Normal weight	Count	36	85	121	23	79	102	59	164	223
	%	35.3	78.7	57.6	25.0	79.8	53.4	30.4	79.2	55.6
Overweight	Count	55	9	64	53	13	66	108	22	130
	%	53.9	8.3	30.5	57.6	13.1	34.6	55.7	10.6	32.4
Class obesity	Count	7	0	7	8	1	9	15	1	16
	%	6.9	0.0	3.3	8.7	1.0	4.7	7.7	0.5	4.0
Class II obesity	Count	-	-	-	3	0	3	3	0	3
	%	-	-	-	3.3	0.0	1.6	1.5	0.0	0.7
Class III obesity	Count	-	-	-	1	0	1	1	0	1
	%	-	-	-	1.1	0.0	0.5	0.5	0.0	0.2
Total	Count	102	108	210	92	99	191	194	207	401
	%	100	100	100	100	100	100	100	100	100

Table 3:- Showing Body Mass Index and Low Back Pain

N = amount, % = Percentage, BMI = Body Mass Index, Underweight = BMI < 18.5, Normal weight = 18.5 – 24.9, Overweight = 25.0 – 29.9, Class I obesity = 30.0 – 34.9, Class II obesity =35-39.99, Class III obesity ≥ 40.0

presence of LBP		***BMI grouped***				***N***	***X^2***	***P-value***
		Underweight	***Normal weight***	***Overweight***	***Obese***			
Yes	Count	8	59	108	19	194	127.39	**<0.01**
	Expected Count	13.5	107.9	62.9	9.7	194.0		
No	Count	20	164	22	1	207		
	Expected Count	14.5	115.1	67.1	10.3	207.0		

Table 4:- Showing Chi-square distribution table for the association between body mass index and low back pain

***N**=amount, **X^2**=chi square, **P-value** = Probability value*

Descriptive Statistics	***Presence of Low Back Pain***		***Low Back Pain Intensity***	
	Yes	***No***	***Mild***	***Severe***
N	194	207	150	43
Mean	25.67	22.00	25.15	27.49
S.D	4.08	2.57	4.12	3.45
Min	15.80	14.50	15.80	19.80
Max	43.00	30.80	43.00	39.80

Table 5:- Showing Descriptive statistics of Body Mass Index and Low Back Pain

***N** = amount, **Min** = Minimum, **Max** = Maximum, **S.D** = Standard deviation,**BMI** = Body Mass Index, Underweight = BMI < 18.5, Normal weight = 18.5 – 2+364.9, Overweight = 25.0 – 29.9, Class I obesity = 30.0 – 34.9, Class II obesity = 35-39.99, Class III obesity ≥ 40.0*

Model Summary			
Step 1	-2 Log likelihood	Cox and Snell R Square	Nagelkerke R Square
	264.74	0.41	0.55

Table 6:- Showing Binary logistic regression summary
$\mathbf{R^2}$= Coefficient of determinant

Dependent variables	***B***	***S.E***	***Wald***	***df***	***P-value***	***Exp(B)***	***95% C.I.for EXP(B)***	
							Lower	***Upper***
Age			5.65	3	0.13			
Age (20 - 29)	1.78	1.19	2.27	1	0.13	5.96	0.58	60.83
Age (30 - 39)	1.89	1.13	2.81	1	0.09	6.64	0.73	60.63
Age (40 - 49)	1.18	1.15	1.05	1	0.30	3.25	0.34	30.94
Sex (Male)	-0.12	0.36	0.11	1	0.74	0.89	0.44	1.80
Daily work duration	0.00	0.05	0.00	1	0.95	1.00	0.91	1.11
Weekly work duration	0.04	0.20	0.04	1	0.84	1.04	0.70	1.53
Health status			**20.71**	**3**	**<0.01***			
Health status (Excellent)	**3.48**	**1.30**	**7.16**	**1**	**0.01***	**32.36**	**2.54**	**413.03**
Health status (Good)	-0.08	1.27	0.00	1	0.95	0.93	0.08	11.18
Health status (Fair)	1.25	1.16	1.17	1	0.28	3.50	0.36	33.85
Exercise engagement (Yes)	0.66	0.35	3.59	1	0.06	1.93	0.98	3.80
Job posture			4.52	2	0.10			
Job posture (Sit)	0.49	0.68	0.52	1	0.47	1.64	0.43	6.25
Job posture (Stand)	1.18	0.71	2.76	1	0.10	3.24	0.81	12.98
Posture duration	**0.12**	**0.06**	**5.00**	**1**	**0.03***	**1.13**	**1.02**	**1.26**
BMI	**-0.38**	**0.06**	**47.19**	**1**	**<0.01***	**0.68**	**0.61**	**0.76**

Table 7:- Showing Binary logistic regression summary
C.I = *Confidence Interval,* ***S.E*** *= Standard Error,* ***df****= degree of freedom,* ***P-value*** *= Probability value*

	Presence of Low Back Pain		
	Yes	***No***	***Percentage Correct***
Initial	159	0	100.0
	150	0	0.0
	Overall Percentage		**51.5**
Final	129	30	81.1
	27	123	82.0
	Overall Percentage		**81.6**

Table 8:- Showing Binary logistic regression equation classification table

IV. DISCUSSION

The prevalence of low back pain among Nigerians residing in Port Harcourt was 48% which was higher (47%) than the findings from General Outpatient Clinic of the University College Hospital in Ibadan, Nigeria by [14]. It was also higher (46%) than the findings from study conducted by [9] amongst staff in a rural hospital in Nigeria. A lower prevalence (42%) was observed in a study by [15], which is in contrast to the present study. High low back pain prevalence (67.1%) is also comparable to the study by [16]. Male drivers had a higher prevalence (20.6%) of low back pain. This was in agreement with the report by [17], where the prevalence of low back pain (64%) was a major problem among commercial motor drivers due to length of time spent sitting while driving.

Posture duration is another factor that affects low back pain and is statistically significant (p=0.03), implying that a longer duration in a particular posture can predispose an individual to low back pain. Individuals whose job requires standing experience low back pain more (55.3%). The rate of occurrence of low back pain is higher among individuals whose job duration was 6 times in a week and sits during their job. From the Binary logistics low back pain is not statistically associated (p=0.84) with job duration but is statistically associated with duration of job posture (p=0.03). These results were similar to the report by [18]. Low back pain was highly prevalent (55.7%) among overweight subjects and was statistically significant (p<0.01) to body mass index. According to [19][20] low back pain was highly prevalent among overweight individuals, which agrees with this study. In the present study the health status of the subjects was statistically significant (p<0.01) to low back pain which means that an individual's state of health can determine whether they would have low back pain or not.

Low back pain was more prevalent among individuals who do not engage in exercise (73.7%). This result was statistically significant (p<0.01)) to low back pain with Chi-square test, predicting the association of low back pain with exercise engagement. However, the binary logistic regression summary predicted no statistical significance (p=0.06) between low back pain and exercise engagement, indicating that engagement in exercise cannot be labeled a risk factor for developing low back pain.

The prevalence of low back pain was most common (43.3%) among individuals within 30-39 years. This is similar to the findings by [21], where low back pain was found to increase gradually between the ages of 30 and 39. From the result of the binary logistic regression summary no significant association (p=0.13) was observed within all the age groups. The prevalence of low back pain was higher (53%) in male subjects than female subjects (47%). This result indicates that the number of males though slightly higher, was almost equal and thus comparable to that of females. From the result of the binary logistic regression summary no statistical significance (p=0.74) was found between age and low back pain.

V. CONCLUSION

The point prevalence of low back pain among Port Harcourt residents was 48%, which represents almost half of the study population, indicating that low back pain is a problem faced by the study population. It may be concluded from this study that low back pain is statistically related to health status, posture duration and body mass index (overweight) of subjects and can be included in the prevention and management program for low back pain. More attention should be paid to low back pain and its risk factors to prevent its occurrence.

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