

Perception, Attitude and Management of "Paja-paja", an African Ethno-Medical Condition, among Nigerians.

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Abstract

"Paja paja", a prominent ethnomedical illness in Southwestern Nigeria, has not been scientifically documented as a health issue. This expository questionnaire-based study was conducted in Lagos State, Nigeria between June, and August 2022 to determine if its symptoms are similar to paresthesia. Data analysis was conducted using NCSS 21 statistical software. Majority (98.6%) of the respondents had experienced "Paja paja" before, mostly in the legs (47.1%) or while sitting (58.7%). The proportion of those who experienced the condition in all extremities is higher among females (21.4%) than among males (16.5%). Likert scale analysis indicates that 39.4% of respondents strongly agreed that "Paja paja" is muscle pull associated with pain that lasts for more than a minute, making it a health issue. The most frequently mentioned perceived health-related cause of "Paja paja" is poor blood flow (117, 27.6%). Key informant interviews linked "Paja paja" to "Pins and needles" sensation. Multilinear regression analysis revealed no significant relationship between ever experienced "Paja paja" and any of the independent variables such as age group ($r=0.011$, $SE=0.008$, $T\text{-statistic}=1.33$, $P\text{-value}=0.19$, $95\% CI=-0.005, 0.027$). A larger study is recommended to ascertain the prevalence, health implication, risk factors, management and medical category that "Paja paja" belongs.

Keywords: Blood Disorder, Ethno-Medical Illness, Health Educators, Lower Limbs, Neurology, Nigeria, “Paja Paja”, Paresthesia.

1. Introduction

According to the United States' National Institute of Neurological Disorders and Stroke, paresthesia is defined as a painless tingling, numb, pins and needles prickling sensation usually felt around the hands, arms, legs, and feet [1]. It occurs when sustained pressure is applied over a nerve, inhibiting, or stimulating its function. The nervous system is made up of the Central Nervous System that includes the brain and the spinal cord, and the Peripheral Nervous System that carries signals sent from the brain and the spinal cord to other parts of the body and back to the brain. Hanewinkel reported that numbness and paresthesia are symptoms of polyneuropathy that disables and affects the quality of life of an individual [2]. In 2015, a study showed that paresthesia was a symptom presented in a 77-year-old female that was reported to have abnormal liver function test results [3]. Paresthesia could be caused by back injury, bone fractures, vitamin B12 and Cobalt deficiency, osteoporosis, alcoholism, lead poisoning, diabetic neuropathy and even brain tumor which can also pose potential complications if not properly managed [4]. This condition may be what is referred to as 'khadar' in Middle East [5]. Anecdotal reports refer to “Paja paja”, a Yoruba ethno-medical condition as a painless or painful tingling, numb, pins and needles prickling sensation usually felt around the hands, arms, legs, and feet. There is no known scientific data on or explanation for “Paja paja”, a health-related condition among people in Southwest Nigeria that is not described in any scientific study from Nigeria. In an old paper, Brieger reported on Jedi-jedi, a Yoruba cultural disease entity with an implication for the treatment of childhood diarrhea [6]. Apart from this, data are scanty on other Yoruba cultural diseases that may impact the quality of life of Nigerians but are not well known or understood. This study was designed to evaluate the determinants of “Paja paja” as it has been linked to wrong postures which prevent blood supply to some areas of the body, especially the lower limbs, thereby producing a “tingling” sensation referred to as “Paja paja”. while others think it is cramps, muscle pull or problems with nerves. Hence, the general objective of this study was to assess the similarity between symptoms of paresthesia and perceived indicators of “Paja paja”. The specific objectives were (i) to determine the health seeking behaviors of those who have “Paja paja” (ii) to assess knowledge of “Paja paja” in an urban setting and (iii) to evaluate people’s opinions on the cause of this health condition. It was therefore essential to survey first the accessible urban community to learn more about local perceptions of “Paja paja” before a health education program on it is developed for the health information, awareness, and benefit of the people.

2. Methodology

This survey was conducted in metropolitan Lagos, Lagos State, Southwest Nigeria, a predominantly Yoruba geo-political area with a heterogeneous population. Lagos State is the smallest of the 36 States in Nigeria but the economic capital of the country and the most populated with about 9.1 million people, a figure that was disputed for 17.6 million [7]. The current population of Lagos is put at 9 million people living in the metropolitan area and about 14 million in the peri-urban area [8]. The state is

divided into three Senatorial districts – Lagos East, Lagos Central and Lagos West - and 20 Local Government Administrations (LGAs). A minimum of 3 LGAs were selected from each of the 3 Senatorial districts using simple random sampling.

2.1. Study Design

This questionnaire-based study was expository in the sense that it informs readers with facts and evidence supporting the topic of study that has multiple points of view. The study was also descriptive in that it gave a complete explanation of the topic with evidence, examples, and background history.

2.2. Sample Size Determination

The minimum sample size was calculated using the statistical formula presented by Adcock [9] as stated below:

$$n = [Z^2P(1 - P)]/d^2$$

Where n = sample size

Z = statistic for a level of confidence at 5% = 1.96

P = expected prevalence of proportion = 0.5

d = precision

$$n = 1.962 \times 0.5 (0.5) / 0.052$$

$$n = 3.8416 \times 0.25 / 0.0025$$

$$n = 384.16, \text{ which is approximately equal to } 384.$$

To get the final sample size, a 10% of the sample size was added to cover for attrition:

$(10\% \text{ of } 384) + 384 = 422.4$. Thus, the final sample size is 422 which was rounded up to 430. Six (1.4%) of the questionnaires were discarded because of incomplete or missing information.

2.3. Inclusion/Exclusion Criteria

To be included into the study, a responder must be a Nigerian of either gender and must have been resident in Lagos State for a minimum of 24 months and not just visiting. The minimum age of a respondent must be 18 years who must also be apparently physically and mentally healthy with acceptable sensorium and awareness of his/her immediate environment. Those who are non-Nigerians, visitors, children, adolescents, those admitted in health facilities for whatever reason and those with poor sensorium or on any hallucinogenic drugs were excluded from the study.

2.4. Ethical Clearance

The approval to conduct this study was given by the Institutional Review Board of the Nigerian Institute of Medical Research (IRB-22-054) and received on September 26, 2022. The objectives of the study were explained to the respondents. Verbal informed consent was requested for by the researchers and given by the respondents.

2.5. Data Collection

Data collectors were trained at the Nigerian Institute of Medical Research during their internship on Research Methodology, a course that lasted from June to August 2022, approximately 3 months. Data collection was conducted from September 30 to October 3, 2022. In each of the 10 selected LGAs, data collectors were instructed to choose alternative streets from

any of the main streets in the LGA. Adult male or female in every third house visited was interviewed on each side of the street. Where no adult was available in a specific house, the next house was visited. In each of the visited house, adult respondents were asked about their knowledge, attitude, perception of and personal experience with “Paja paja”. Socio-demographic information gathered include age group, highest educational level attained, marital status, ethnicity, and religious affiliation. Respondents were also asked about the position they were when they experienced “Paja paja”, frequency of its occurrence, part of the body where it occurred and perceived cause of the condition. Likert’s scale was used to tabulate some responses as strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree. Information on frequency of experience with “Paja paja”, perceived causal factor, and chronic disease the respondents have been treated for were collected. As an aid to better interpretation of findings, 7 Key informant interviews were conducted, 3 with university lecturers, and 4 with military officers

2.6. Statistical Analyses

Data entry and statistical analysis: Data was initially coded and entered into WPS Spreadsheet 2019 and cleaned before being exported into NCSS 21 (Kaysville, Utah, USA) statistical software for analysis. Descriptive and inferential statistics were adopted in analyzing the data. While the descriptive statistics comprised frequencies, percentages, mean, and standard deviation, the inferential statistic used was multilinear regression. Results of the regression analysis were calculated based on 95% confidence level ($\alpha = 0.05$) and tests using measures of association such as odds ratio. Prevalence was defined as number of people with sample characteristics divided by total number of people in the sample multiplied by 100. A p-value less than 0.05 was considered statistically significant. Data were presented as Tables, and Figures.

3. Results

Variable	Sub-variable	Freq.	%
Age group (yrs)	≤30	220	51.9
	31-40	98	23.1
	41-50	59	13.9
	>50	47	11.1
Gender	Male	173	40.8
	Female	251	59.2
Marital status	Single	234	55.2
	Married	160	37.7
	Divorced	11	2.6
	Widowed	19	4.5
Occupation	Unemployed	169	39.9
	Employed	111	26.2
	Retiree	3	0.7
	Student	141	33.2
Highest educational level attained	No education	11	2.6
	Primary	13	3.1
	Secondary	99	23.3
	Tertiary	301	71.0
Ethnicity	Yoruba	277	65.3
	Igbo	85	20.1
	Hausa	15	3.5
	Others	47	11.1
Religion	Christianity	354	83.5
	Islam	64	15.1
	Others	7	1.4

Table 1: Socio-Demographic Characteristics of Respondents, August 2022

Most of the 424 respondents (59.2% female) were aged ≤30 years (51.9%), singles (55.2%), mostly of Yoruba ethnic group (65.3%) and of Christianity religious affiliation (83.5%). A relatively high proportion of them (39.9%) were unemployed though most (71.0%) have attained tertiary education.

		Have you ever experienced “Paja paja”?		Fisher’s χ^2 (P-value)	OR (95%CI)
		Yes	No		
All		418 (98.6)	6 (1.4)	-	-
Age group (years)	≤30	219 (99.6)	1 (0.4)	1.76 (0.18)	5.50 (0.64, 47.51)
	31-40	95 (96.9)	3 (3.1)	1.18 (0.28)	0.29 (0.06, 1.48)
	41-50	58 (98.3)	1 (1.7)	0.00 (1.00)	0.81 (0.09, 7.02)
	>50	46 (97.9)	1 (2.1)	0.00 (1.00)	0.62 (0.07, 5.41)
Gender	Male	170 (98.3)	3 (1.7)	0.002 (0.97)	0.69 (0.14, 3.44)
	Female	248 (98.8)	3 (1.2)		1.46 (0.29, 7.31)
Marital status	Single	230 (98.3)	4 (1.7)	0.02 (0.88)	0.61 (0.11, 3.38)
	Married	159 (99.4)	1 (0.6)	0.42 (0.52)	3.07 (0.36, 26.51)
	Divorced	11 (100.0)	0 (0.0)	0.00 (1.00)	undefined
	Widowed	18 (94.7)	1 (5.3)	0.21 (0.65)	0.23 (0.03, 2.03)
Occupation	Unemployed	167 (98.8)	2 (1.2)	0.00 (1.00)	1.33 (0.24, 7.35)
	Employed	108 (97.3)	3 (2.7)	0.76 (0.38)	0.35 (0.07, 1.75)
	Retiree	3 (100.0)	0 (0.0)	0.00 (1.00)	undefined
	Student	140 (99.3)	1 (0.7)	0.19 (0.67)	2.52 (0.29, 21.76)
Highest educational level attained	No education	11 (100.0)	0 (0.0)	0.00 (1.00)	undefined
	Primary	13 (100.0)	0 (0.0)	0.00 (1.00)	undefined
	Secondary	99 (100.0)	0 (0.0)	0.77 (0.38)	undefined
	Tertiary	295 (98.0)	6 (2.0)	1.26 (0.26)	undefined
Ethnicity	Yoruba	276 (99.6)	1 (0.4)	4.37 (0.03)	9.72 (1.12, 83.98)
	Igbo	81 (95.3)	4 (4.7)	5.57 (0.02)	0.12 (0.02, 0.67)
	Hausa	15 (100.0)	0 (0.0)	0.00 (1.00)	undefined
	Others	46 (97.9)	1 (2.1)	0.00 (1.00)	0.62 (0.07, 5.41)
Religion	Christianity	348 (98.3)	6 (1.7)	0.30 (0.59)	undefined
	Islam	64 (100.0)	0 (0.0)	0.22 (0.64)	Undefined
	Others	6 (100.0)	0 (0.0)	0.00 (1.00)	Undefined

Table 2: Experience of “Paja paja” Relative to Socio-Demographic Characteristics of Respondents

Majority (98.6%) of the respondents had experienced “Paja paja” before. Those aged ≤30 years were 5½ more likely to have experienced this condition than those in other age groups ($\chi^2=1.76$, P-value=0.18, OR=5.50, 95% CI=0.64, 47.51). Females were about 1½ more likely to experience “Paja paja” ($\chi^2=0.002$, P-value=0.97, OR= 1.46, 95% CI=0.29, 7.31) than

males and married people were over thrice more likely to have experienced “Paja paja” ($\chi^2=0.42$, P-value=0.52, OR=3.07, 95% CI=0.36, 26.51) compared to those in other marital status. Regardless of age group, sex, marital status, occupation or educational, almost all members of the society had, at least once, experienced the condition known as “Paja paja”

Question	Response	Gender			Age-group			
		All	Male	Female	≤30	31-40	41-50	>50
If you experience “Paja paja”, in what position do you mostly experience it?	Sitting	249 (58.7)	100 (57.8)	149 (59.4)	124 (56.3)	58 (59.2)	37 (62.7)	30 (63.8)
	Lying down	100 (23.6)	42 (24.3)	58 (23.1)	53 (24.1)	21 (21.4)	15 (25.4)	11 (23.4)
	Standing	56 (13.2)	25 (14.4)	31 (12.3)	34 (15.5)	14 (14.3)	4 (6.8)	4 (8.5)
	Sitting and lying down	9 (2.1)	1 (0.6)	8 (3.2)	5 (2.3)	2 (2.0)	1 (1.7)	1 (2.1)
	Sitting and standing	1 (0.2)	0 (0.0)	1 (0.4)	1 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)
	Lying down and standing	1 (0.2)	1 (0.6)	0 (0.0)	1 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)

In what part of your body do you mostly experience "Paja paja"?	Arm	9 (2.1)	4 (2.4)	5 (2.0)	3 (1.4)	1 (1.0)	1 (1.7)	4 (8.7)
	Hand	22 (5.3)	10 (5.9)	12 (4.8)	12 (5.5)	6 (6.3)	3 (5.2)	1 (2.2)
	Leg	197 (47.1)	85 (50.0)	112 (45.2)	105 (48.0)	48 (50.5)	25 (43.1)	19 (41.3)
	Feet	78 (18.7)	34 (20.0)	44 (17.7)	45 (20.6)	20 (21.1)	12 (20.7)	1 (2.2)
	All the above	81 (19.4)	28 (16.5)	53 (21.4)	38 (17.3)	16 (16.8)	11 (19.0)	16 (34.8)
	Arm and leg	1 (0.2)	0 (0.0)	1 (0.4)	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)
	Arm and feet	3 (0.7)	0 (0.0)	3 (1.2)	2 (0.9)	0 (0.0)	0 (0.0)	1 (2.2)
	Hand and leg	8 (1.9)	3 (1.8)	5 (2.0)	1 (0.5)	2 (2.1)	3 (5.2)	2 (4.4)
	Hand and feet	6 (1.4)	3 (1.8)	3 (1.2)	2 (0.9)	1 (1.0)	1 (1.7)	2 (4.4)
	Feet and leg	9 (2.1)	1 (0.6)	8 (3.2)	6 (2.7)	1 (1.0)	2 (3.4)	0 (0.0)
	Hand, feet, and leg	4 (1.0)	2 (1.2)	2 (0.8)	4 (1.8)	0 (0.0)	0 (0.0)	0 (0.0)
How often do you experience "Paja paja"	Daily	22 (5.3)	5 (2.9)	17 (6.8)	8 (3.7)	6 (6.3)	5 (8.6)	3 (6.4)
	Weekly	91 (21.8)	41 (24.1)	50 (20.2)	53 (24.3)	19 (20.0)	8 (13.8)	11 (23.4)
	Monthly	160 (38.3)	60 (35.3)	90 (40.3)	84 (38.5)	27 (28.4)	28 (48.3)	21 (44.7)
	Yearly	145 (34.7)	64 (37.6)	81 (32.7)	73 (33.5)	43 (45.3)	17 (29.3)	12 (25.5)
Have you been treated for any of these conditions?	Diabetes (DM)	16 (3.8)	5 (2.9)	11 (4.4)	1 (0.5)	4 (4.1)	5 (8.5)	6 (12.8)
	Hypertension (HT)	35 (8.3)	14 (8.1)	21 (8.4)	2 (0.9)	10 (10.2)	14 (23.7)	9 (19.2)
	Joint pains (JPs)	108 (25.5)	41 (23.7)	67 (26.7)	50 (22.7)	25 (25.5)	19 (32.2)	14 (29.8)
	Hypertension and Joint Pains	3 (0.7)	1 (0.6)	2 (0.8)	0 (0.0)	1 (1.0)	0 (0.0)	2 (4.3)
	Diabetes, Hypertension, Joint Pains	106 (25.0)	44 (25.4)	62 (24.7)	50 (22.7)	13 (13.3)	8 (13.6)	9 (19.1)
	No	156 (36.8)	68 (39.3)	88 (35.1)	91 (41.4)	45 (45.9)	13 (22.0)	7 (14.9)

Table 3: Part of the Body Where Respondents Experience Papa Paja

Most respondents answered that they experience the health condition under investigation when they are sitting down (58.0%), lying down (23.6%) or while standing. More females (59.0%) than males (56.6%) and more among those age over 50 years (63.8%) said they experience "Paja paja" while sitting. Slightly more males (24.3%) than females (23.1%) and those in age group 41-50 years said they experience "Paja paja" while lying down. Most respondents agreed that "Paja paja" mostly occurs in the leg (47.1%), feet (18.7%) or in all extremities (19.4%). The proportion of those who experience the condition in the legs was higher among males (50.0%) than among females (45.2%) and among those aged 40 years and below (50.5% and 48.0%) than among those older than 40 years of age (43.1% and 41.3%). The proportion of those who experience the condition in all extremities was higher among females (21.4%) than among males (16.5%). Interestingly, the proportion of

those who experience "Paja paja" increases with age group from 16.8% among those aged 31-40 years to 34.8% among those aged 50 years and older. However, 17.3% of those aged ≤ 30 years experienced the condition in all extremities. A relatively high proportion (160, 38.3%) of the respondents said they experience "Paja paja" at least once monthly while 34.7% said they experience the condition at least once a year. The proportion of those who experience the condition monthly was higher among females (40.3%) than among males (35.3%) and highest among those aged 41-50 years (48.3%) than in other age groups.

While 25.5% and 25.0% of the respondents have been treated for joint pains and collectively for diabetes, hypertension, and joint pains, only 3.8% and 8.3% have been treated for diabetes mellitus alone and hypertension alone.

Chronic diseases	Number treated for the chronic disease	Number (%) that had previously experienced “Paja paja”
Diabetes	16	16 (100.0)
Hypertension	35	34 (97.1)
Joint pains	108	106 (98.2)
Hypertension and Joint Pains	3	3 (100.0)
Diabetes, Hypertension, Joint Pains	106	104 (98.1)
Respondents without treatment for chronic diseases	156	155 (99.4)

Table 4: Proportion of Respondents Treated for Chronic Disease who had Previously Experienced “Paja Paja”
 Almost all respondents treated for diabetes, hypertension, or joint pains collectively or in isolation have experience “Paja paja”

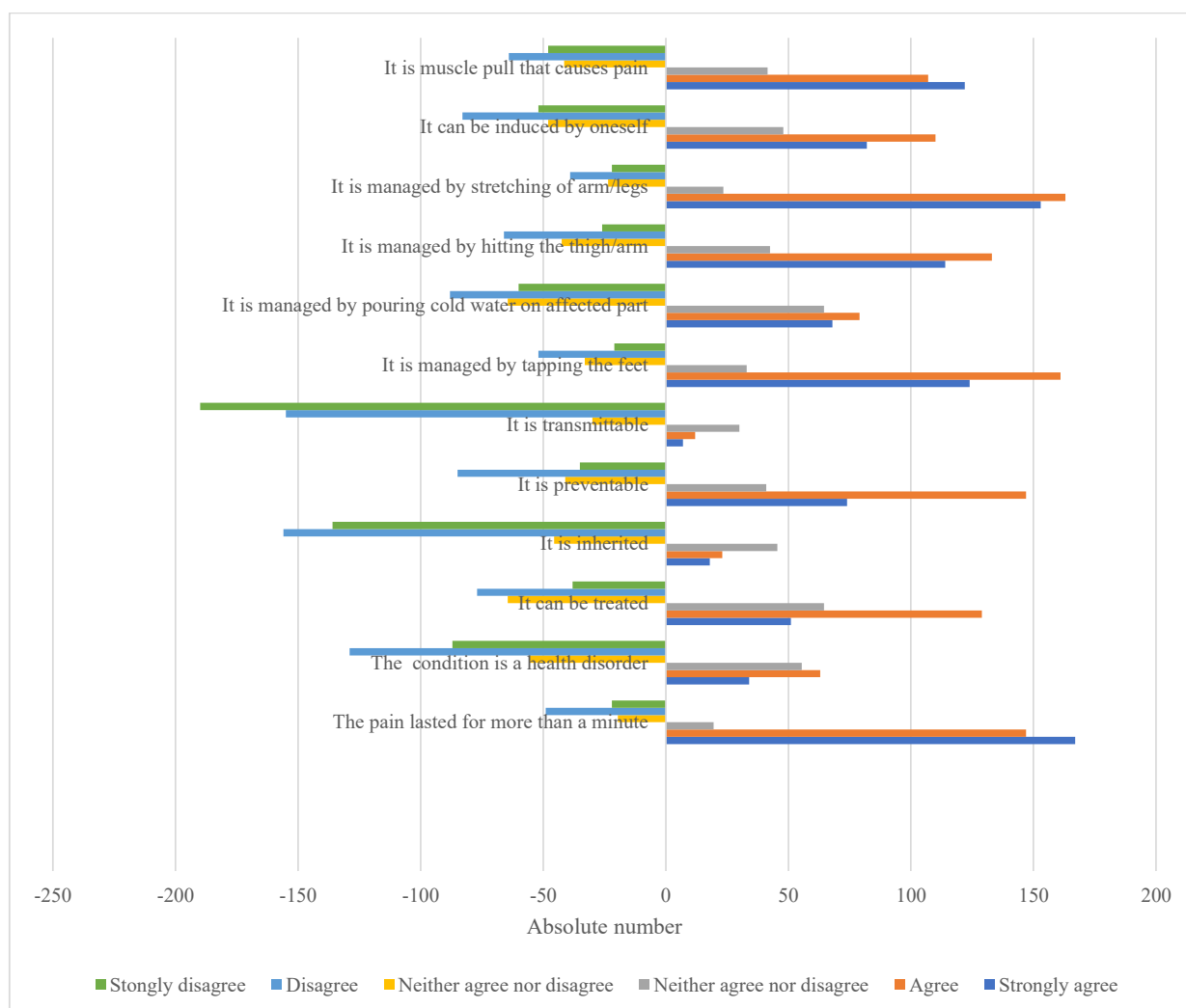


Figure 1: Respondents' Perception, Attitude and Management of “Paja Paja”.

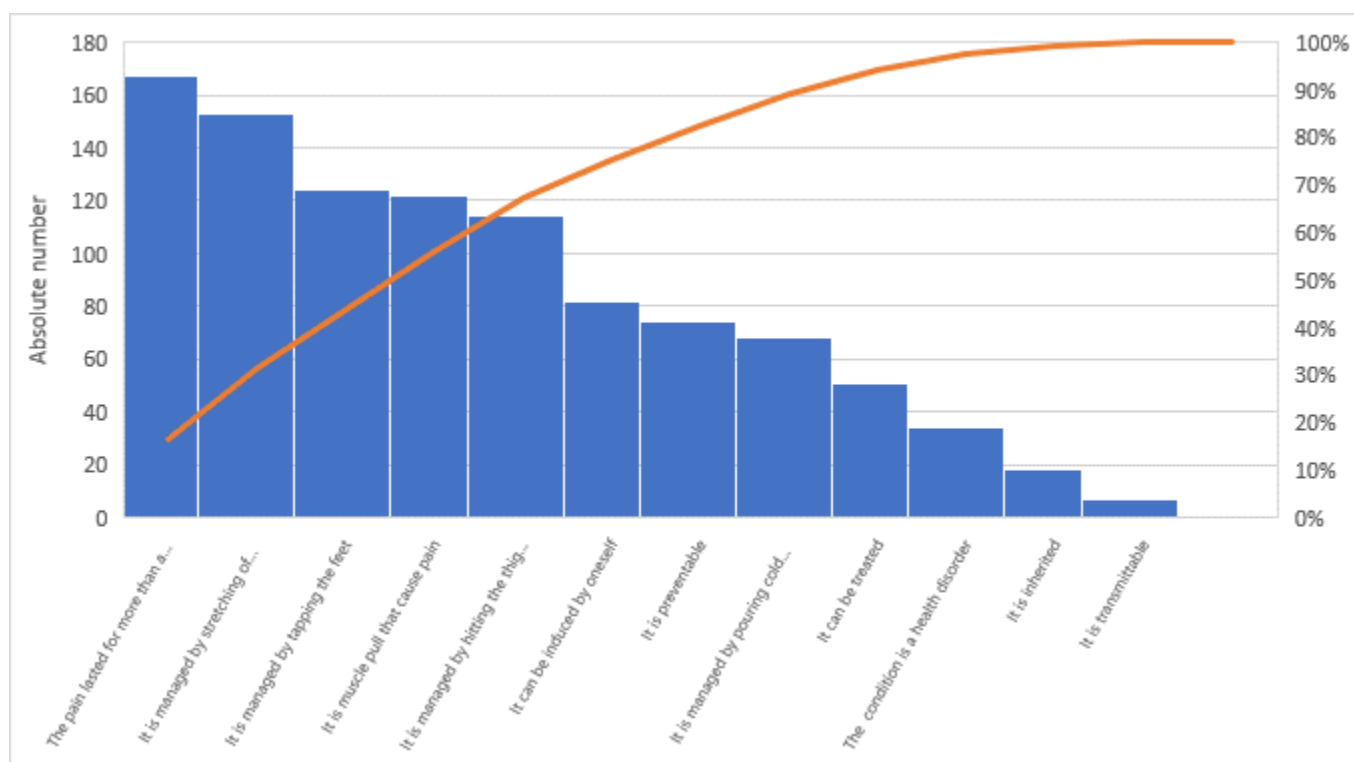


Figure 2: Pareto Chart Plotting the Distribution of the Data in Descending Order of Frequency with a Cumulative Line on a Secondary Axis as Percentage of the Total.

A sizable proportion of respondents (39.4%) strongly agreed that “Paja paja” is associated with pain that lasts for more than a minute making it a health issue. Only 11.6% and 5.2% disagreed and strongly disagreed that the pain lasts for more than a minute and 9.2% neither agreed nor disagreed. Few (8.0%) strongly agreed that it is a disorder or that it can be treated (12.0%). Approximately one third of the respondents (32.1%) strongly disagreed that “Paja paja” can be inherited and about half (44.8%) also strongly disagreed that it is transmittable. When asked about how those afflicted with “Paja paja” managed the condition, 38.0% agreed that it is coped with by tapping

the affected foot on the ground, 16.0% strongly agreed that it is managed by pouring cold water on the affected part of the body, 31.4% agreed that the condition subsides by hitting the thigh or the arm and 36.1% strongly agreed that it is controlled by stretching the affected limb. While 28.8% strongly agreed that “Paja paja” is muscle pull that induces pain, 11.3% strongly disagreed with this belief. The Pareto chart in Figure 2 plots the distribution of “strongly agree” responses in a descending order of frequency with the highest frequency being that the pain lasts for more than one minute.

Perceived cause of “Paja paja”	Freq.	%
Bad environment	1	0.2
Bad posture or sitting position	43	10.1
Dehydration	1	0.2
Excessive consumption of cold water	1	0.2
Excessive stress	26	6.1
Fatigue	3	0.7
Hereditary	1	0.2
Lack of Calcium	1	0.2
Lack of regular physical exercise	10	2.4
Nutritional problem	1	0.2
No idea	3	0.7
Old age	1	0.2
Prolonged lying down	6	1.4
Prolonged sitting	52	12.3
Prolonged standing	12	2.8

Relates to cold weather	9	2.1
Relates to joint problem	3	0.7
Relates to muscle problem	25	5.9
Relates to nerve problem	5	1.2
Relates to poor blood flow or oxygen	117	27.6
Relates to Stroke	1	0.2
Relates to underlying body condition	2	0.5
Relates to Vitamin deficiency	3	0.7

Table 5: What respondents perceived as cause of “Paja paja”

The most frequently mentioned perceived health-related causes of “Paja paja” is related to hematological problems especially poor blood flow (117, 27.6%), muscle problems (25, 5.9%), neurological problems (5, 1.2%), joint problems (3, 0.7%), vitamin deficiency (3, 0.7%), underlying body condition (2, 0.5%), lack of calcium (1, 0.2%) and stroke (1, 0.2%). Only 12.3% ascribed “Paja paja” to prolonged sitting while 10.1% said it is due to bad posture and 5.7% believed the condition is due to excessive stress. Though in very low frequency, it is interesting to note that 2.4% and 0.7% related the condition to lack of regular exercise and to vitamin deficiency respectively. That nutritional deficiency (0.2%), lack of calcium (0.2%) and dehydration (0.2%) were hardly considered as being responsible

for the condition does not mean that the probability should be discountenanced.

3.1. Key Informants’ Interview

The key informants verified the findings from the questionnaire survey. Two of the three University Lecturers confirmed “Paja paja” as “feelings of pins and needles” while the third said “the sensation grips.” These feelings of “pins and needles” and of “gripping sensation” may categorize “Paja paja” as or similar to paresthesia. Two teachers said it is a “sensation of electric shock”, a military personnel referred to it as “muscle pull” and a health worker as “pins and needles”. However, there was no medication mentioned to ameliorate the condition.

R ² =0.015	F -statistic=0.883,	P-value=0.52
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Independent variable	Regression coefficient (r)	Standard error	t-statistic	P-value	95% Confidence interval	Correlation between dependent an independent variable	
						95% Confidence interval	P-value
Intercept	0.974	0.050	19.77	0.00	0.877, 1.071	-	-
Age group	0.014	0.008	1.71	0.09	-0.002, 0.030	0.05 (-0.04, 0.15)	0.30
Gender	-0.008	0.012	-0.70	0.48	-0.031, 0.015	-0.05 (-0.15, 0.04)	0.29
Marital status	-0.009	0.011	-0.81	0.42	-0.031, 0.013	-0.01 (-0.10, 0.09)	0.89
Occupation	0.003	0.005	0.65	0.52	-0.007, 0.013	0.02 (-0.08, 0.11)	0.74
Educational status	0.008	0.009	0.88	0.38	-0.009, 0.025	0.04 (-0.05, 0.14)	0.38
Ethnicity	0.006	0.006	1.05	0.30	-0.006, 0.018	0.05 (-0.04, 0.15)	0.27
Religion	-0.007	0.013	-0.57	0.57	-0.033, 0.018	-0.03 (-0.13, 0.06)	0.49

Table 6: Multivariate Regression Analysis with Ever Experience “Paja Paja” as the Dependent Variable and Some Independent Variables.

There was no significant relationship between whether a person has ever experienced “Paja paja” (dependent variable) and any of the independent variables such as age group (r=0.011, SE=0.008, T-statistic=1.33, P-value=0.19, 95% CI=-0.005,

0.027), gender (r= -0.011, SE=0.012, T-statistic= -0.12, P-value=0.91, 95% CI=-0.025, 0.022) or educational status (r=0.014, SE=0.009, T-statistic=1.55, P-value=0.12, 95% CI=-0.004, 0.031). These independent variables are responsible for

an insignificant (P -value=0.52) 1.8% variation in the dependent variable. The Table also shows that there was no significant positive or negative correlation between the dependent and the independent variables.

4. Discussion

As of now, there is no specific medical terminology given to Yoruba ethno-medical condition referred to as “Paja paja”, though anecdotal report relates it to malfunction of an affected nerve. In this study, almost all respondents, regardless of age group, gender, occupation, marital status, educational status, ethnicity, or religion, had experienced “Paja paja”. There is no record of patients consulting for the treatment of “Paja paja” at the Clinic of the Nigerian Institute of Medical Research and probably in other tertiary or secondary health facilities, though this needs further clarification. One of the key findings in this study is that the proportion of respondents that were unemployed (39.9%) was higher than the national unemployment statistics of 33.3% [10].

This may be due to the current economic situation in the country which the government is doing its best to address. There is hardly any data from Nigeria or any other African country on “Paja paja” among adults, though this condition probably affects many people. Because its associated pain or discomfort is transient, the condition may be easily overlooked, and people may continue with their daily chores. Since majority of the respondents believed that “Paja paja” is linked with sitting (58.7%) or lying down (23.6%) position, it’s likely to be associated with pressure, although few (13.2%) respondents believed that it occurs when standing. This may be related to what Okino et al reported as alteration in “shear wave velocity” that is related to the intramuscular pressure in the leg compartment [11]. This study suggests that when a person is seated for 2 hours, elevated shear wave velocity in the leg is as a result of “fluid retention in extracellular space of the compartment”. Even though only 6.1% of the respondents perceived the cause of “Paja paja” as excessive stress, this notion should not be disregarded because excessive stress can and is often psychological in nature. A Japanese study suggests that anxiety and stress tolerance affect muscle elasticity and animal studies have also shown that prolonged pressure affects dermal microcirculation in rats with spinal cord injury [12-14]. However, causes of stress in the study site are probably related to economic downturn affecting many activities in the country. One respondent believed that “Paja paja” is a symptom of an underlying health condition. This may mean that some members of the society possibly have “Paja paja” as an early symptom of metabolic disease such as hypothyroidism, pituitary disorder, diabetes mellitus or Raynaud’s phenomenon, though Raynaud’s phenomenon may be far-fetched in a tropical environment [15-17].

However, early diagnosis of any of these diseases can ensure better management and improved quality of life. Another possible explanation of “Paja paja” is that it is an early symptom of Multiple sclerosis, in which the immune system attacks the protective myelin sheath covering nerve fibers thereby resulting in inflammation which may manifest as temporary paralysis, sciatica or pins and needles sensation of paresthesia. Only

1.2% of the respondents believed that “Paja paja” relates to nerve problem. Excessive physical stress on a nerve, causing paresthesia, may be what is referred to as “Paja paja”. Paresthesia, a “pins and needles” feeling usually felt at the extremities may be painless, painful, harmless, or harmful. Paresthesia, when chronic, can be due to a medical condition or damage to a nerve. Incidentally, one person said that “Paja paja” could be a sign of impending stroke. Only 5.3% and 2.1% experienced “Paja paja” in the upper limb, the hand, and the arm respectively. The pathophysiology of “Paja paja” in these parts of the body may be related to Carpal tunnel syndrome, the narrowing of the wrist tunnel which may cause pressure on the median nerve leading to pain and numbness in the upper limb [18]. Other perceived causes of “Paja paja” which are synonymous with symptoms of paresthesia, are low level or lack of vitamins, (especially B12 and Cobalt, which are essential for the health of the nerves), while medications for HIV, some antibiotics and certain types of chemotherapy and some treatments for seizures might also be included as causative agent of paresthesia [19].

5. Conclusion and Recommendation

Majority (98.6%) of the respondents had experienced “Paja paja” before, mostly in the legs (47.1%) or while sitting (58.7%). The proportion of those who experience the condition in all extremities is higher among females (21.4%) than among males (16.5%). This study reports that 39.4% respondents strongly agreed that “Paja paja” is muscle pull associated with pain that lasts for more than a minute, making it a health issue. The findings in this paper suggests that “Paja paja” is closely related to paresthesia but it is still unclear if it has neuro-muscular or hematological origin. It may also be one of those condition that occur due to multi-factorial issues. A larger study is recommended to ascertain not only which medical category that “Paja paja” belongs to but also what exactly is its health implication, how it impacts one's quality of life, its economic implications, and its most appropriate management. Such study should conduct relevant diagnostic tests such as hematological profile, Genetic testing, nerve conduction studies, electromyography, nerve biopsy, X-ray, Magnetic resonance imaging (MRI), and possibly Computed tomography (CT) scan. Health educators should play a role in getting people to know the implication of “Paja paja” and to encourage them to go for medical intervention. Further study should also ascertain the occurrence of “Paja paja” in other ethnic groups in Nigeria and in other parts of Africa.

Study limitations

There are certain limitations in this study that need clarification. First, the prevalence of the condition under investigation was assumed so as to draw a sample size. Therefore, the sample size would have been smaller or bigger than necessary. The study was conducted only among the Yoruba-speaking ethnic group in metropolitan Lagos City, Southwest Nigeria, and did not take into consideration other ethnic groups or other ecological zones in the country. Thus, the study was skewed towards this ethnic group in urban setting. Future studies on this topic should consider if similar condition exists in other ethnic groups in various residences – urban, semi-urban or rural – and what its nomenclature and other characteristics are. Further, the study did not investigate body mass index of the respondents for obesity

or for other causes of pressure to bring about pins and needles sensation. Social history for alcohol consumption, cigarette smoking, use of recreational drugs as well as past medical, surgical, or gynecological history of the respondents were also not taken. Gathering such data would have made the study more robust and would have moved this study closer to identifying risk factors for the condition under investigation. Future studies will take these and other salient points into consideration.

Declaration of Competing Interest

The authors declare no competing interest.

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