SOCIO-ECONOMIC STATUS OF STROKE SURVIVORS AND PEOPLE LIVING WITH OSTEOARTHRITIS IN PORT HARCOURT METROPOLIS, RIVERS STATE

Authors:

OTI, Ifeanyi Kalu [1]; BABATUNDE, Seye [2]

Author Affiliations:

1. Department of Physiotherapy, University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt.
2. World Health Organization (WHO)

Correspondence:
Oti, Ifeanyi Kalu. BMR, PT (UNN), MSc.PH (UPH), MACAPN.
Department of Physiotherapy,
University of Port Harcourt Teaching Hospital (UPTH),
Port Harcourt.
Phone: +234 7030990911
Email: ifeanyioti85@yahoo.com, oti_ifeanyi@uniport.edu.ng.

ABSTRACT

Background: Socio-economic status (SES) is an important determinant of health, and one of the major factors that determine treatment and rehabilitation outcomes of debilitating chronic conditions such as stroke and osteoarthritis (OA).

Aim of the Study: This study determined and compared SES of stroke survivors and people living with osteoarthritis (PLWOA) in Port Harcourt Metropolis, Rivers State.

Material and Methods: The study design was comparative cross-sectional. A multistage sampling technique was used to select 78 stroke survivors and 186 PLWOA from the two strata making up Port Harcourt Metropolis – Port Harcourt City Local Government Area (PHALGA) and Obio-Akpor Local Government Area (OBALGA). Kuppuswamy's socio-economic scale was used to measure the current SES of the two groups from June 2019 to January 2020. Data were analyzed using the IBM SPSS version 24. Chi-square test statistic was used to compare the proportion of stroke survivors with low, middle and high SES and that of PLWOA. P-value $\leq$ 0.05 was considered statistically significant.

Results: Results revealed that majority of stroke survivors and PLWOA were males, 55 (70.5%) and 106 (57%) respectively and within 51-60years of age. The proportions of stroke survivors with low, middle and high SES were 26.1%, 56.5% and 17.4% compared to 41.7%, 49.7% and 8.1% respectively of those of PLWOA. The difference observed between these proportions was statistically significant (Chi-square = 10.272, P-value = 0.006).

Conclusion: The study concluded that most stroke survivors and PLWOA in Port Harcourt metropolis were of middle SES, and that low SES was higher in PLWOA than in stroke survivors.

Keywords: *Socio-economic status, stroke, osteoarthritis, Port Harcourt*

INTRODUCTION

Socio-economic status (SES) is described as a complex measure of an individual's economic and social standing[1]. It is one of the recognized key factors that have both social and medical implications, and is more frequently used to depict an economic difference among individuals and the society as a whole[2]. It is a very important determinant of health and often based on income, education, and occupation[3]. Erreygers[2] posited that as a general rule, wealthy individuals tend to be in better health than people of poorer status. Socio-economic status has been largely reported to have significant health impact on a multitude of diseases[4-6]. Some of the measures of SES among others include level of education, family background and education of parents, current occupation, net income, household, income, and wealth[7]. Individuals are usually separated into groups based on these metrics; from least advantaged to most advantaged, or low, medium, or high SES[7]. Cookson et al[6] established a link between SES and individual health status. Individuals with relatively low SES may not have very good access to care services, or even transportation to get healthcare. As a result of this, such individuals may not be able to adequately take care of their health; others may not have sufficient education to realize the effect certain conditions have on their health. The stress related to individual's socioeconomic status alone may impact his or her health[8]. There is a strong association between SES and health[9]. Low socioeconomic status is a global problem and major social determinant of health[10]. Socio-economic status is one of the major factors that determine treatment and rehabilitation outcomes of debilitating chronic conditions[11]. It has been reported that about two-thirds of all countries worldwide have felt the effect of low SES[10]. In Sub-Sahara Africa, low SES has been linked to poor living conditions as well as poor treatment outcomes[5]. It is believed that a good SES is a strong social predictor for individuals to have a better economic, social status, and live a healthy and successful life. Globally, low SES has been responsible for more than 60% of all deaths, and two-thirds of this is in the Sub-Sahara African region[12]. Stroke and osteoarthritis are both chronic non-communicable diseases of major public health concerns[13]. They are both diseases of disabilities associated with substantial morbidity as well as socio-economic problems among sufferers[14]. Onwuchekwa et al[15] reported that the prevalence of stroke in Nigeria is common in rural area, and it is very frequent among the elderly population. In another study, Akinkpelu et al[16] explained that in Nigeria, one out of every five individual aged 40 years and above usually have symptomatic osteoarthritis, and the

prevalence is at 19.6%. With the growing population in Nigeria and the socio-economic challenges, the poor people in most communities in Nigeria are suffering from a wide range of diseases including chronic diseases such as strokes and osteoarthritis[15, 16]. Hence, the aim of this study was to determine and compare the socio-economic status (SES) of stroke survivors and people living with osteoarthritis (PLWOA) in Port Harcourt Metropolis, Rivers State.

MATERIAL AND METHODS

Study Area

The study area was Port Harcourt Metropolis, Rivers State. Port Harcourt is also the capital and largest city in Rivers State. It is located in south-south region of Nigeria, lies along the Bonny River and is part of the Niger Delta area of Nigeria. It has two major local government areas; The Port Harcourt City Local Government Area (PHALGA) and Obio-Akpor Local Government Area (OBALGA).

Study Design

The study adopted a comparative cross-sectional research design.

Study Population

The study population was stroke survivors and people living with osteoarthritis (PLWOA) in Port Harcourt Metropolis, Rivers State.

Sample Size Determination

Sample size was determined using the formula for comparative studies:
$2 (Z\alpha+Z\beta)^2 \times P (1-P)/ (P1-P2)^2$ [17]

Where

$Z\alpha$ = value for α error at desired confidence level of 95%. P-value is 0.05 (two-tailed test). In this case, $Z\alpha = 1.96$.

$Z\beta$ = value of β error which is 1-statistical power. At statistical power of 80% and a β error of 20%, $Z\beta = 0.84$.

P1 = Proportion of stroke survivors with low socio-economic status = 78% = 0.78

P2 = Proportion of PLWOA with low socio-economic status = 55%

= 0.55

P = (P1+P2)/2 = (0.78+0.55)/2 = 1.33/2 = 0.67

Imputing these values into the formula above, we have:

$N = 2 (1.96+0.84)^2 \times 0.67 (1-0.67) / (0.78-0.55)^2$

$= 15.68 \times 0.22 / 0.23^2$

$= 3.45/0.05$

$N = 69$

For both groups (stroke and OA), we have 69+69 = 138
After adjusting for 10% non-response, we have minimum sample size per group = 76.

Sampling Method

The sampling method used for this study is a multistage sampling technique for both stroke survivors and people living with osteoarthritis.

Sampling for stroke survivors:

Stage1: Stratification of Port Harcourt Metropolis into 2 strata (PHALGA and OBALGA) by non-proportionate stratified sampling technique. PHALGA stands for Port Harcourt City Local Government Area

while OBALGA stands for Obio-Akpor Local Government Area. They are the Local Governments that make up Port Harcourt Metropolis. This was followed by allocation of sample size to both local government areas. Since the minimum sample size per group was 76, a sample of 38 was allocated to both PHALGA and OBALGA.

Stage2: Selection of all communities in both PHALGA and OBALGA by cluster sampling. There were a total of 28 communities in PHALGA and 64 in OBALGA.

Stage 3: Selection of 10 communities in PHALGA and 30 communities in OBALGA by cluster sampling.

Stage 4: Selection of households in selected communities by cluster sampling. There are 640 households in the selected 10 communities in PHALGA and 1,858 households in the selected 30 communities in OBALGA. A total of 34 households were selected from the 640 in PHALGA while 50 households were selected in OBALGA by cluster sampling.

Stage 5: Selection of adult male or female (aged 40 and above) in selected households by simple random sampling. In PHALGA, 34 individuals were selected while 50 individuals were selected in OBALGA. Information was incomplete for 4 individuals in PHALGA and 2 in OBALGA. The total number of individuals (stroke survivors) finally selected in PHALGA are 30 and 48 in OBALGA, making it a total sample of 78 stroke survivors for the study.

Sampling for People living with Osteoarthritis (PLWOA):

Stages 1 and 2 were applicable for stroke survivors

Stage 3: Selection of 15 communities in PHALGA and 40 communities in OBALGA by cluster sampling.

Stage 4: Selection of households in selected communities by cluster sampling. There were 990 households in the selected 15 communities in PHALGA and 2,830 households in the selected 40 communities in OBALGA. A total of 77 households were selected from the 990 in PHALGA while 113 households were selected in OBALGA.

Stage 5: Selection of adult male or female (aged 40 and above) in selected households by simple random sampling. In PHALGA, 77 individuals were selected while 113 individuals were selected in OBALGA. Information was incomplete for 1 individual in PHALGA and 3 individuals in OBALGA. The total number of individuals (PLWOA) finally selected in PHALGA are 76 and 110 in OBALGA, making it a total sample of 186 PLWOA for the study.

Study Instrument

The research instrument was a Semi-Structured Questionnaire (SSQ) containing two Parts (I - II). Part I consisted of socio-demographic features while Part II consisted of research questions on SES of the participants. The questions on SES were adapted from Kuppuswamy's socio-economic scale. The Kuppuswamy's scale is commonly used to measure socio-economic status (SES) in urban and rural areas[3]. This scale was devised by Kuppuswamy in 1976 and consists of a composite score which includes the education, occupation and income per month, yielding a score of 3–29 [3]. Section A (Education) has seven categories with 1 as the lowest score, and 7 the highest. Section B (Occupation) also has seven categories with 1 as the lowest score and 10 as the highest. Section C (income per month) has seven categories with 1 as the lowest score and 12 as the highest. It is scored as low, middle and high[18]. Scores 5-10 means low SES, scores 11-25 means middle SES while scores 26-29 means high SES.

Administration of the Instrument

The data used for study was obtained through administration and retrieval of the instrument. The questionnaire was administered to participants by the principal investigator and four trained research assistants who carefully explained the purpose of the study to the respondents. An introductory letter (participant's information sheet) explaining the purpose of the study was dully attached to the instruments. Participants were made to sign the consent form before they were admitted for the study.

Ethical Consideration

Ethical approval for the study was obtained from University of Port Harcourt Ethical Research Committee. The reference number of the ethical clearance letter is UPH/CEREMAD/REC/MM61/050. An informed consent letter was signed by participants before they were admitted for the study. All the information provided by the participants was treated with high level of trust and confidentiality. The study did not pose any risk to participants.

Data Analysis

The data collected were collated, coded and analysed using the computer software (Statistical Package for Social Science [SPSS] package) version 24. Descriptive statistics was used to express the variables (categorical variables) in proportions. Chi-square test statistic was used to compare the proportion of stroke survivors with low, middle and high socio-economic status and that of people living with osteoarthritis (PLWOA). P-value ≤ 0.05 was considered statistically significant.

Results

Table 1 gives a description of the socio-demographic characteristics (Age, Sex, Marital Status, Education, Religion, Ethnicity and Occupation) of the participants (Stroke survivors and PLWOA). The results showed that out of 78 stroke survivors and 186 PLWOA, 55 (70.5%), 106 (57%) were males, while 23 (29.5%), 80 (43%) were females respectively. Majority 37 (47.4%), 71 (38.2%) were between the ages of 51-60years. Also, majority 65 (83.3%), 149 (80.1%) of the participants were married. The level of education among the participants showed that those with secondary education were the majority 36 (25.6%), 118 (63.4%) for both stroke survivors and PLWOA respectively. For religion, majority of the stroke and PLWOA 59 (75.6%), 129 (69.4%) respectively were Christians. The ethnicity of the participants showed that Igbo represented the majority with 25 (32.1%), 47 (25.3%) for stroke survivors and PLWOA respectively. Lastly, the participants' occupation showed that majority of them were into Trading which represents 25 (32.1%), 60 (32.3%) for stroke survivors and PLWOA respectively.

Table 2 revealed that the proportions of stroke survivors with low, middle and high SES were 23 (26.1%), 39 (56.5%) and 16 (17.4%) compared to 78 (41.7%), 93 (49.7%) and 15 (8.6%) respectively of those of PLWOA. The difference observed between these proportions was statistically significant (Chi-square = 10.272, P-value = 0.006).

Table 1: Socio-demographic Characteristics of Stroke survivors (n=78) and PLWOA (n=186)

Categories	Stroke survivors (n=78)		PLWOA (n=186)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Sex				
Male	55	70.5	106	57
Female	23	29.5	80	43
Age				
40-50 years	9	11.5	37	19.9
51-60 years	37	47.4	71	38.2
61-70years	28	35.9	68	36.6
71 and above	4	5.1	10	5.4
Marital status				
Single	6	7.7	22	11.8
Married	65	83.3	149	80.1
Divorced/separated	4	5.1	10	5.4
Widowed	3	3.8	5	2.7
Education				
No formal education	20	25.6	23	12.4
Primary	4	5.1	11	5.9
Secondary	36	25.6	118	63.4
Tertiary	18	46.2	34	18.3
Religion				
Christianity	59	75.6	129	69.4
Islam	7	9	7	3.38
Others	12	15.4	50	26.9
Ethnicity				
Igbo	25	32.1	47	25.3
Yoruba	4	5.1	0	0
Hausa	4	5.1	10	5.4
Ikwere	15	19.2	47	25.3
Ijaw	9	11.5	21	11.3
Ogoni	5	6.4	33	17.7
Etche	9	11.5	19	10.2
Kalabari	7	9.0	9	4.8
Occupation				
Trading	25	32.1	60	32.3
Civil service	22	28.2	54	29
Farming	13	16.7	25	13.4
Public service	1	1.3	1	0.5
Apprenticeship	2	2.6	13	7
Retired	15	19.2	33	17.7

Table 2: Socio-economic status of stroke survivors (n=78) and people living with osteoarthritis (PLWOA) (n = 186)

SES Categories (Kuppuswamy's Socio-economic scale)	Participants		X^2	Df	P-value
	Stroke survivors n (%)	PLWOA n (%)			
Low	23 (26.1)	78 (41.7)	10.272	2	0.006*
Middle	39 (56.5)	93 (49.7)			
High	16 (17.4)	15 (8.6)			

* Statistically significant

DISCUSSION

This study found out that low SES was higher in PLWOA than in stroke survivors, the observed difference being statistically significant. On the other hand, majority of stroke survivors and PLWOA were of middle socio-economic class while a much smaller percentage was of high SES. Although no study which specifically compared SES among stroke survivors and PLWOA was found, some studies have investigated the influence of SES on these conditions separately and also on the general population. Adedoyin et al[19] investigated the influence of socio-economic status of adult Nigerians on casual blood pressure. They found out that hypertension was higher among those in the lower socio-economic class, and concluded that low SES was associated with development of hypertension among Nigerian adults. Hypertension is a risk factor for stroke. Therefore, the finding of the present study which showed that majority of the stroke survivors and PLWOA were of middle socio-economic class, followed by those of low SES agrees with that of Adedoyin and colleagues[19]. This finding is also similar to those of [4; 20-24]. The design of the study is, however, at variance with most of these studies. Wang et al[20] and Heely et al[21] for instance, looked only at the influence of SES on stroke mortality but could not attempt to compare it with another condition of disability. A study conducted in the United States reported that PLWOA constituted a high level of individuals of SES[22]. This study which was a longitudinal population-

based study carried out in North Carolina, focused only on SES and OA. Therefore, no comparison was made with other diseases of disabilities. Addo et al[4] and Cox et al [25] reported an association between low SES and stroke while Cleveland et al[22] found OA and baseline morbidities to be higher in individuals of low SES among participants in the United Kingdom. These findings are however, similar to the assertion made by Kim et al[24] that low SES existed among stroke survivors globally.

The finding of this study is also at variance with a widely held belief which expects low SES to be higher among stroke survivors. It may, however, be confounding to find in this study that low SES was higher among PLWOA than in stroke survivors. The reason for this could be that less economic and emotional support are being given to PLWOA by families, friends, communities, organizations, and the government since it is generally believed that OA is usually not as disabling as stroke. This could be exemplified by the existence of several foundations in support of stroke survivors in contrast to PLWOA. In line with this belief, PLWOA are not expected to be seen as disabled as stroke survivors, and therefore may be able to provide for and take care of themselves better than stroke survivors.

CONCLUSION/RECOMMENDATION

The study has clearly demonstrated that most stroke survivors and PLWOA in Port Harcourt Metropolis, Rivers state are people of middle socio-economic class. Also, low SES was higher in PLWOA than in stroke survivors. Therefore, there is need for Government at all levels to provide basic social amenities to alleviate the living standard of people in our communities especially individuals with debilitating chronic conditions as low socio-economic status (SES) has been linked to stroke survivors and PLWOA in the study.

References

1. Laura DH, Bruna G, Alicia M, et al. Measuring socio-economic position for epidemiological studies in low- and middle-income countries: a methods of measurement in epidemiology paper, International Journal of Epidemiology, Volume 41, Issue 3, June 2012, Pages 871–886.
2. Erreygers G. A dual Atkinson measure of Socioeconomic Inequality of health. Health economics, 2013; *22*(4), 466-479.
3. Singh T, Sharma S, Nagesh S. Socio-economic status scales updated for 2017. Int J Res Med Sci 2017; 5:3264-7.
4. Addo J, Ayerbe L, Mohan KM, et al. Socioeconomic status and stroke: an updated review. Stroke. 2012 Apr; 43(4):1186-91.
5. Mapulanga M, Nzala S, & Mweemba C. The Socio-economic Impact of Stroke on Households in Livingstone District, Zambia: A Cross-sectional Study. Annals of medical and health sciences research, 2014; *4*(8), 123-127.
6. Cookson R, Propper C, Asaria M, & Raine R. Socio-economic inequalities in health care in England. Fiscal Studies, 2016; *37*(3-4), 371-403.
7. Galobardes B, Shaw M, Lawlor DA, Lynch J W, Smith G D. Indicators of socioeconomic position (part 1). Journal of Epidemiology & Community Health, 2016; 60(1), 7-12

8. Businelle MS, Kendzor DE, Reitzel LR, et al. Pathways linking socioeconomic status and postpartum smoking relapse. Annals of Behavioral Medicine, 2012; *45*(2), 180-191.
9. Bashinskaya B, Nahed BV, Walcott BP, Coumans JV, Onuma OK.. Socioeconomic status correlates with the prevalence of advanced coronary artery disease in the United States. PloS one, 2012; *7*(9), e46314.
10. World Health Organization. Social determinants of health. WHO Regional Office for South-East Asia; 2008.
11. Tey NP, Lai SL, Teh JK. The debilitating effects of chronic diseases among the oldest old in China. Maturitas. 2016 Dec 1; 94:39-45.
12. Boutayeb A. The burden of communicable and non-communicable diseases in developing countries. Handbook of disease burdens and quality of life measures. 2010:531.
13. Strong K, Mathers C, & Bonita R. Preventing stroke: saving lives around the world. The Lancet Neurology, 2017; *6*(2), 182-187
14. Carr AJ. Beyond disability: measuring the social and personal consequences of osteoarthritis. Osteoarthritis and Cartilage. 1999 Mar 1; 7(2):230-8.
15. Onwuchekwa AC, Tobin-West C, & Babatunde S. Prevalence and risk factors for stroke in an adult population in a rural community in the Niger Delta, south-south Nigeria. Journal of Stroke and Cerebrovascular Diseases, 2014; *23*(3), 505-510.
16. Akinpelu A O, Alonge TO., Adekanla BA, & Odole AC. Prevalence and pattern of symptomatic knee osteoarthritis in Nigeria: a community-based study. Internet Journal of Allied Health Sciences and Practice, 2009; *7*(3), 10.
17. Kish L. Statistical design for research. John Wiley & Sons; 2005 Feb 25.
18. Kuppuswamy B. Manual of socioeconomic status (Urban). 1st ed. Delhi: Manasayan; 1981:66-72.
19. Adedoyin RA, Mbada CE, Awofolu OO, Oyebami OM. The influence of socio-economic status on casual blood pressures of the adult Nigerians. European Journal of Preventive Cardiology. 2005 Jun 1; 12(3):271-3.
20. Wang S, Zhai H, Wei L, Shen B, Wang J. Socioeconomic status predicts the risk of stroke death: a systematic review and meta-analysis. Preventive medicine reports. 2020 Sep 1; 19:101124.
21. Heeley EL, Wei JW, Carter K, et al. Socioeconomic disparities in stroke rates and outcome: pooled analysis of stroke incidence studies in Australia and New Zealand. Medical Journal of Australia. 2011 Jul; 195(1):10-4.
22. Cleveland RJ, Luong ML, Knight JB, et al. Independent associations of socioeconomic factors with disability and pain in adults with knee osteoarthritis. BMC musculoskeletal disorders. 2013 Dec; 14(1):1-0.
23. Wilkie R, Kaur K, Hayward RA. The impact of socioeconomic status on the link between osteoarthritis and the onset of common comorbidities. Clinical and Experimental Rheumatology. 2019 Jan 18; 37(1):44-8.

24. Kim J, Yang KH, Choi AR, et al. Healthcare quality assessments: no guarantees of same outcomes for different socio-economic stroke patients. International Journal for Quality in Health Care. 2021 May; 33(2):mzab081.
25. Cox AM, McKevitt C, Rudd AG, Wolfe CD. Socioeconomic status and stroke. The Lancet Neurology. 2006 Feb 1; 5(2):181-8.