Afr. J. Med. Med. Sci. (2024) **53 (3)** 157-169

Physical Activity and Health-Related Quality of Life among Older Persons attending Primary Health Care Centres in Southwestern Nigeria

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Abstract

Objective: Physical inactivity, responsible for 6% of deaths, has been identified by WHO as the fourth major risk factor for mortality. Inadequate physical activity is responsible for poor health-related quality (HRQoL) of life and 3-5% of all major non-communicable diseases (NCDs). This study aimed at determining level of physical activity, HRQoL and prevalence of chronic NCDs among older persons attending selected primary healthcare centers in Lagos Nigeria.

Method: This was a cross-sectional study done among 266 older persons in PHC centers in Lagos, Nigeria. Multi-stage random sampling was used to select participants. Consecutive sampling recruitment was used to select 266 respondents. Data was collected using structured interviewer-administered questionnaire and analysis was done using SPSS version 20. The level of significance was $p < 0.05$.

Results: The level of physical activity was low with overall PASE score of 46.5. Most of the respondents were unable to achieve the physical activity guidelines as 68.0%, 92.5% and 98.5% of respondents did not engage in moderate, vigorous and muscle-strengthening activities in past 7 days respectively. Majority of the respondents (84.6%) had good HRQoL. Most respondents who had poor HRQoL had lower PASE scores and this was statistically significant ($p < 0.001$). Respondents had diabetes, stroke or hypertension with a prevalence rate of 13.9%, 7.1% and 62.8% respectively.

Conclusion: The level of physical activity was low but most of the respondents had good HRQoL. However, most of respondents who had poor HRQoL had low PASE scores. The prevalent chronic NCDs were hypertension, diabetes and stroke.

Keywords: Older persons, health-related, physical activity, primary healthcare, quality life, non-communicable disease

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Abstrait

Objectif: L'inactivité physique, responsable de 6 % des décès, a été identifiée par l'OMS comme le quatrième facteur de risque majeur de mortalité. Une activité physique inadéquate est responsable d'une mauvaise qualité de vie liée à la santé (HRQoL) et de 3 à 5 % de toutes les principales maladies non transmissibles (MNT). Cette étude visait à déterminer le niveau d'activité physique, la QVLS et la prévalence des MNT chroniques chez les personnes âgées fréquentant des centres de soins de santé primaires sélectionnés à Lagos au Nigeria.

Méthode: Il s'agissait d'une étude transversale réalisée auprès de 266 personnes âgées dans des centres de SSP à Lagos, au Nigeria. Un échantillonnage aléatoire à plusieurs degrés a été utilisé pour sélectionner les participants. Le recrutement par échantillonnage consécutif a été utilisé pour sélectionner 266 répondants. Les données ont été recueillies à l'aide d'un questionnaire structuré administré par un intervieweur et l'analyse a été effectuée à l'aide de SPSS version 20. Le niveau de signification était $p < 0,05$.

Résultats: Le niveau d'activité physique était faible avec un score PASE global de 46,5. La plupart des répondants n'ont pas été en mesure d'atteindre les directives en matière d'activité physique puisque 68,0 %, 92,5 % et 98,5 % des répondants n'ont pas participé à des activités modérées, vigoureuses et de renforcement musculaire au cours des 7 derniers jours respectivement. La majorité des répondants (84,6 %) avaient une bonne QVLS. La plupart des répondants qui avaient une QVLS médiocre avaient des scores PASE inférieurs, ce qui était statistiquement significatif ($p < 0,001$). Les répondants souffraient de diabète, d'accident vasculaire cérébral ou d'hypertension avec un taux de prévalence de 13,9 %, 7,1 % et 62,8 % respectivement.

Conclusion: Le niveau d'activité physique était faible mais la plupart des répondants avaient une bonne HRQoL. Cependant, la plupart des répondants qui avaient une QVLS médiocre avaient des scores PASE faibles. Les MNT chroniques prévalentes étaient l'hypertension, le diabète et les accidents vasculaires cérébraux.

Introduction

Health-related quality of life [HRQoL] is defined as an individual's or group's perceived physical or mental health.[1] HRQoL is a subdivision of quality of life (QOL) and refers to people's experience of their global health.[2] American thoracic society defines HRQoL as an individual's satisfaction or happiness with domains of life in relation to health.[3]

Physical activity refers to bodily movement produced by skeletal muscles that occur through energy expenditure. Regular and adequate levels of physical activity improve bone and functional health.[4] Physical activity primarily prevents chronic diseases.[5] Aging is an irreversible and inevitable process that takes place in every human. The United Nations agreed cut-off for the elderly is age 60 years and above.[6] Data from the World Population prospect in the 2017 Revision, attests to the fact that there has been notable increase in the average life expectancy globally in the recent years of which Africa has the greatest gain. Globally, the population aged 60 and above is growing faster than all younger age groups and compared to 2017, the number of people aged 60 years and above is expected to rise more than double by 2050 and more than triple by 2100, rising from 962 million in 2017 to 2.1 billion in 2050 and 3.1billion in 2100.[7]

As life expectancy increases, one of the greatest challenges encountered is a decline in the health-related quality of life as one advances in age. The risks of chronic non-communicable diseases [NCDs] in the older persons have been on the increase and are reasons for concern. Communicable diseases constitute significant threat to Nigeria's health sector and the rapid rise in burden of NCDs appear to be placing the sector at a huge disadvantage.[8]

According to WHO, physical inactivity constitutes the fourth leading risk factor for global mortality. [4] It has been shown that a large number of the older persons are unable to achieve the recommended level of physical activity for health in the face of increase in debilitating diseases among the older persons. Developing and middle income countries such as Nigeria find it challenging to address these chronic diseases due to financial barriers and inadequate biomedical technology.[8] Sedentary lifestyle has become predominant among Nigerian's due to the type of jobs available, reduction in the use of active transportation, prolonged screen time, drift towards urbanization and misuse of one's leisure time for engaging in physical activity.[5] Physical inactivity is inversely proportional to one's health status and increasing physical inactivity is both a personal and societal challenge.[4]

Physical inactivity has been identified by WHO as the fourth leading risk factor for global death leading to an average of 3.2 million deaths globally [6% of deaths globally]. Worldwide, about 31% of adults aged 15 years and above were insufficiently active in 2008 [men 28% and women 34%]. In addition, physical inactivity is presumed to be the reason for about 21-25% of breast and colon malignancies, 27% of diabetes mellitus and about 30% of ischemic heart disease burden.[4]

In a research done in Brazil by Leandro et al, physical inactivity was responsible for 3-5% of all major NCDs and 5.31% of all-cause mortality.[9] another study done by Hart DP in a rural area in United States of America revealed that most of the adult participants were unable to meet the guidelines for physical activity (58.7%) and 35.7% of them had poor HRQoL. This study also concluded that 56.1% of those who were 65 years and above failed to meet the physical activity recommendations and 29.6% of them had poor HRQoL.[10] Baseline information on physical activity is relevant to controlling the epidemic of chronic non-communicable diseases occurring in many African countries.[11] The health-care cost of Physical inactivity was 53.8 billion dollars worldwide in 2013 and physical inactivity associated mortality contributed 13.7 billion productivity losses and 13.4 million Disability-Adjusted life years [DALYs] worldwide, of which high-income countries accounted for a significant proportion of economic burden [80.8% of health-care costs and 60.4% of indirect costs] and low-income and middle-income countries have predominant proportion of the disease burden [75.0% of DALYs].[12]

HRQoL has public health importance for the older persons and remain the focus of planning strategies for improvement in the years spent despite the changes that occur with senescence and disease process.[13]

The health benefits of engaging in regular physical activity are under estimated. Elderly individuals are challenged with myriads of chronic diseases that are preventable by implementing the strategies of WHO daily recommendation of physical activity for the elderly.

This study aimed at determining the level of physical activity and health-related quality of life of the older persons attending in selected primary healthcare centers in urban areas of Lagos State, Nigeria.

Materials and Methods

Description of study area

Lagos state came into existence on the 27th of May 1967 by virtue of states decree No. 14. It is the smallest state yet has the highest number of urban

population in Nigeria. It is the sixth megacity in the world. It consists of five administrative divisions- Ikeja, Badagry, Ikorodu, Epe and Lagos [Eko]. Lagos [Eko] is the core of Lagos state and consists of five local government authorities which are Lagos Island, Lagos mainland, Apapa, Eti-Osa and Surulere. [14]

Oshodi-Isolo local government area falls under the Lagos west senatorial zone and is bounded by Alimosho, Ikeja, Surulere and AmuwoOdofin LGAs.[15] It has an area of 42.0km[2] with a population of 629,061 in the 2006 census and a population projection of 866,300 in 2016.[16] It is divided into two constituencies and eleven wards. The constituencies are Oshodi-Isolo Constituency I and II and the wards are Oshodi-Bolade, Orile-Oshodi,Mafoluku, Sogunle, Alasia/Sogunle, Isolo, Ajao estate, Ilasamaja, Okota, Ishagatedo and Oke-Afa/ Ejigbo.[17]

Oshodi-Isolo LGA has 1 secondary health care facility (Isolo general hospital) and 6 primary health care facilities whichare Ayoni PHC, Ajibulu PHC, Ewututu PHC, Shogunle PHC, Oshodi PHC centers.

Surulere local government is one the five local governments in Lagos [Eko] and one of the 20 local governments in Eko. It is a residential and a commercial area with a total land area of 27.1km^2 and a population density of 62,551/km[2]. The last census in 2006 revealed that the population size was 1,274,362 million people with those aged 60 and above consisting of 21,761 thousand people of the total population.[18]

Surulere local government has two constituencies- Surulere constituency I and Surulere constituency II and six wards in each. In Surulere constituency I, the wards are Akinhanmi/Cole, Yaba/ Ojuelegba, Gbaja/Stadium, Shitta/ Ogunlana drive, AdeniranOgunsanya and Iponri housing estate/ Eric Moore. The wards in Surulere constituency II are Orile, Coker, Aguda, Ijeshatedo, Itire and Ikate.[18] There are 10 public health facilities in Surulere LGA.

The public health facilities comprise of 1 secondary health care center [Randle General Hospital] and 9 primary health care centers, which are : Akerele, Baruwa, Orile, Ejire, Anjorin, Iponri, Airways, Coker-Agudaand Femi Gbajabiamila PHC centers.

Study Design

The design is a descriptive cross-sectional study that was conducted among the elderly in Oshodi-Isolo and Surulere local government areas of Lagos state. The study was designed to investigate the socio-demographic characteristics, the level of physical activity, the HRQoL and prevalence of chronic NCDs of the respondents.

Study Population

Inclusion criteria

Only those aged 60 and above willing to participate and attended the selected PHCs in Surulere and Oshodi-Isolo LGA were included in the study.

Exclusion criteria

Those aged 60 and above attending selected PHCs in the selected LGAs but are too ill to participate in the study.

Sample size determination

In determining the sample size, Cochran's formula was used to calculate the minimum sample size required.

$$n = \frac{Z^2 pq}{d^2}$$

Where n= Minimum sample size, Z = value of standardized normal deviate of at 95% confidence interval (1.96), p = expected prevalence rate for the population from which the sample is taken. For this study p is 63.6%.[19] , q = 1-p, d = margin of error acceptable =0.05.

Assuming a non-response rate and attrition, the minimum sample size will be increased by 20%

In determining the minimum sample size, n was calculated using p, (the prevalence of sufficient physical activity in patients with hypertension attending clinics in Obafemi Awolowo University Teaching Hospitals Complex and State Government Hospital, Asubiaro, Osogbo, Osun State, Nigeria) as 63.6%.[19]

$$n = \frac{\{1.96\}^2 \{0.64\} \{0.36\}}{0.05^2}$$

$n = 354$

Since population is less than 10,000, Finite correction was

$$n = \frac{n^0}{1+(\frac{n^0-1}{N})}$$

$n^0 = 354$

N=Total population of elderly attending Ejire and Oshodi PHC centers from April-June 2018 =294+296= 590 (both PHCs have almost equal number of attendees over a 3 months duration, thus, equal number of participants were recruited from each of t[illegible] PHCs)

$$n = \frac{354}{1+(\frac{354-1}{590})}$$

$n = 221.53$

20% of initial sample size was added to cover up for attrition

$n = 20 \times 221.53 = 44.3$

100

$n = 221.53 + 44.3 = 265.83 = 266$

133 participants were recruited from each of the PHCs

Sampling technique

A multistage sampling technique for recruitment of all elderly in selected PHCs centers in Oshodi-Isolo and Surulere LGAs was done.

In stage 1; a simple random technique was done using balloting method to select two administrative divisions in Lagos State out of five, of which Ikeja and Lagos [Eko] were selected. In stage 2; a simple random technique was done to select one LGA each in selected administrative divisions using balloting method. Under Ikeja administrative division, Oshodi-Isolo LGA was selected. Under Lagos [Eko] administrative division, Surulere LGA was selected.

In stage 3; a simple random technique was done to select one PHC center in each of the two LGAs selected using balloting technique. Oshodi PHC center in Oshodi-Isolo LGA was selected and Ejire PHC in Surulere LGA was selected. In stage 4; a total population sampling was used to determine the proportion of study participants to be sampled from each healthcare center. Due to similarity in the number of elderly that attended the selected PHCs, 133 respondents in each of the PHC centers that met the inclusion criteria were selected consecutively, making a total of 266 respondents in both Ejire and Oshodi-Isolo PHC centers.

Data collection tools and techniques

The questionnaire consisted socio-demographic characteristics of respondents, Level of physical activity using physical activity scale for the elderly (PASE), Health-related quality of life of respondents using Short-form 36 (SF-36), Chronic non-communicable diseases (NCDs)-related health status of the respondents using WHO NCD country profile 2014.

Scoring and grading

Level of physical activity in respondents was assessed using Physical Activity Scale for the Elderly [PASE]. There were 12 activities and 24 questions in total and the overall score ranges from 0-400 with higher scores showing good levels of physical activity. The PASE score for each item is calculated by multiplying the amount of time used in carrying out each activity in the past one week by item weights. The activities were walking outside the home, light sports, moderate sport, vigorous sport, muscle strength, light housework, heavy housework, home repair, lawn work, outdoor gardening, caring for another person, work for pay and their weights were 20,21,23,23,30,25,25,30,36,20,35 and 21 respectively. Each time section and hour category was assigned values. "Seldom" has an overall value of 6% and individual values for < 1 hour, 1-2 hours, 2-4 hours and >4 hours which are 0.11,0.32,0.64 and 1.07 respectively. "Sometimes" which has an overall value of 26% has individual value for < 1 hour, 1-2 hours, 2-4 hours and >4 hours which are 0.25, 0.75, 1.5 and 2.5 respectively. "Often" which has overall value of 68% has individual value for < 1 hour, 1-2 hours, 2-4 hours and >4 hours which are 0.43, 1.29,2.57 and 4.29 respectively.[20,21]

Health-related quality of life

The HRQoL of the respondents was assessed using SF-36 which has 36 questions, 8 subscale scores and 2 component scores.[22]. The final item values vary depending on the subscales. Question 22 is not used in the calculation of any scale score but was incorporated to note any change in health status from a cross-sectional administration of the questionnaire.[23] Computation of the SF-36 involves, firstly, recoding of the pre-coded numeric values based on SF-36 scoring key for the required 35 out of the 36 items.

There are two main component scores; the physical and the mental component. The physical components consists of general health (GH), physical functioning (PF),role physical (RP)and bodily pain(BP).Mental health (MH), role emotional(RE),social functioning(SF) and vitality(VT) constitute the mental component. The two main component scores were gotten by computing and averaging all the domains in each of them. The final step was done by transforming each raw scale score.[24,25,26]. It was done by using the formula below

$$\text{Transformed scale} = \left[\frac{\text{Actual raw score} - \text{lowest possible score}}{\text{Possible raw score range}}\right] \times 100$$

Scores greater than or equal to 50 indicated good HRQoL while scores lesser than 50 indicated a poor HRQoL.[24,27]

Data Analysis

Analysis of the data was done using IBM SPSS 20. Calculation of means, standard deviations, medians and inter-quartile ranges (IQR) were used to describe the data. Chi-square test was used to analyze categorical variables and for associating age with the HRQoL score. Mann-Whitney-U and Kruskall-Wallis tests were used for comparing the PASE scores with socio-demographic characteristics, HRQoL scores and prevalence of NCDs. The p-value was taken at the level of significance of 0.05.

Ethical consideration

Approval for this study was obtained from Health Research and Ethics Committee of Lagos University Teaching Hospital (ADM/DCST/HREC/APP/294) dated 13th November 2018. Informed consent was obtained from each participant after duly explaining

the nature and purpose of the study. Respondents were assured of confidentiality of information they supply.

Principles of ethics including autonomy, justice and beneficence were complied with.

Results

Socio-Demographic characteristics: The mean age of the respondents was 68.5±7.0 years. Majority of the respondents were of the female gender (76.3%) and were of the Yoruba tribe (82.0%). Very few respondents had tertiary education (7.1%). Most of the respondents were employed (62.4%), had a monthly income or pension of 20,000 Naira and below (77.4%), practiced Islam (54.9%), were married (57.9%) in a monogamous setting (53.4%), lived with their children (52.3%) and had an interacting family model (54.9%).

PASE scores of respondents:

Table 1 showed that majority of the average component scores were 0.0. Household activity domain (30.0) contributed the most to the overall PASE score (46.4) of which light housework (25.0) contributed the most to household activity. Walk outside the home (8.6) contributed the most to leisure time activity domain (10.9).

Table 1: PASE scores of respondents

	Median (IQR)	Range	
		Minimum	Maximum
Walk outside the home	8.6 (2.2, 8.6)	0.0	85.8
Light sport/recreational activities	2.3 (0.0, 9.0)	0.0	90.1
Moderate sport/recreational activities	0.0 (0.0, 2.5)	0.0	59.1
Vigorous sport/recreational activities	0.0 (0.0, 0.0)	0.0	9.9
Muscle strengthening activities	0.0 (0.0, 0.0)	0.0	12.9
Light housework	25.0 (0.0, 25.0)	0.0	25.0
Heavy housework	0.0 (0.0, 25.0)	0.0	25.0
Home repairs	0.0 (0.0, 0.0)	0.0	30.0
Lawn or yard care	0.0 (0.0, 0.0)	0.0	36.0
Caring for another person	0.0 (0.0, 0.0)	0.0	35.0
Leisure time activity domain	10.9 (4.0, 17.6)	0.0	110.25
Household activity domain	30.0 (0.0, 60.0)	0.0	141.0
Work related activity domain	0.0 (0.0, 0.0)	0.0	14.7
Total PASE	**46.4(17.6, 85.1)**	**0.0**	**179.8**

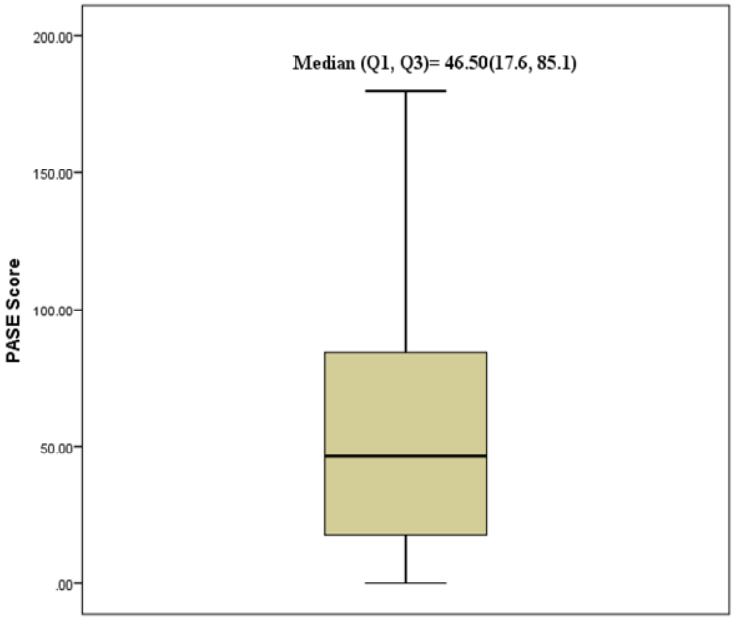


Figure 1: Showed box plot of PASE scores with median value of 46.50 with first quartile and third quartile of 17.6 and 85.1 respectively.

Table 2 showed HRQoL score of the mental component summary (81.0±19.5) was higher than the physical component summary (61.5±23.1). It also showed that role limitation physical (55.1±48.8) contributed the least and social functioning (89.1±22.7) contributed the most to total SF-36 score which has a mean ± SD of 71.2±19.2.

Most of the respondents had good HRQoL scores (84.6%) and 41 out of 266 respondents had poor HRQoL. Prevalence of self-reported Non-communicable diseases showed that respondents had been diagnosed with chronic NCDs which are hypertension, diabetes and stroke, among which the prevalence of hypertension was the highest (62.8%) and that of stroke was the lowest (7.1%).

Table 2: HRQoL score of respondents

	Mean±SD	Range Minimum	Maximum
General health (GH)	55.8±15.7	10.0	100.0
Physical functioning (PF)	65.8±24.5	0.0	100.0
Role limitation physical (RLP)	55.1±48.8	0.0	100.0
Role limitation emotional (RLE)	80.1±39.4	0.0	100.0
Social functioning (SF)	89.1±22.7	0.0	100.0
Vitality (V)	72.9±15.8	15.0	95.0
Emotional well-being (EWB)	81.9±12.1	28.0	100.0
Bodily pain (BP)	69.2±24.0	0.0	100.0
Physical component summary (PCS)	61.5±23.1	10.6	94.7
Mental component summary (MCS)	81.0±19.5	15.8	97.5
Total SF-36 score	**71.2±19.2**	**13.2**	**94.5**

Table 3 revealed that respondents within age group 60-64 years had the highest percentage with good HRQoL score 84(91.3%) while those within the age group of 75-79 years has the least 16(64.0%). This association was statistically significant. Marital status and family setting were also statistically associated with good HRQoL ($p<0.005$). While married individuals 137 (89.0%) were more likely to have good HRQoL score compare to widowed 88(78.6%); polygamous family 111(89.5%) also has higher number with good HRQoL compared to individual to monogamous family 114(80.3%). Respondents who were employed 151(91.0%) were more likely to have good HRQoL than retirees 74(74.0%). Lower income/pension was associated with poor HRQoL with those earning <20,000 naira having the highest contribution to poor HRQoL 39(18.9%). These associations were statistically significant.

Table 4 showed that there was an association between those without hypertension and good HRQoL 90 (90.9%). It was also seen that those who did not have diabetes had better HRQoL 196 (85.6%) than those who had it 29 (78.4%), although this was not statistically significant. Those who had stroke were more likely to have a poor HRQoL 7(36.8%) compared to those that did not have it 34(13.8%) and was statistically significant.

Table 5 revealed that those within the younger age bracket had better PASE scores with those within the age group of 60-64 years having the highest score (67.63) and those e”80 years having the least score (3.36). It was also seen that females were more likely to have higher PASE scores than males with their average scores being 60.9 and 23.9 respectively. Those from a polygamous marital setting (48.8) had higher scores when compared with those from monogamous marital setting (45.2), although this was not statistically significant ($p>0.05$). The level of education was seen to be significantly related to higher PASE scores as those with no formal education had the lowest PASE scores (42.6) and those with tertiary education had the highest PASE score (92.7). Employment status was seen to be significantly associated with PASE scores as retirees had lower scores (25.0) when compared to those who were employed (63.7) and this was statistically significant ($p<0.05$). There was significant association between monthly income/pension and higher PASE scores as those who earned d”20,000 naira monthly had the least score (42.6) and those who earned >80,000 naira had the highest score (92.7).

Table 6 showed that those who had hypertension had lower PASE scores (42.6) than those who did not (63.4). There was also statistically significant relationship between those who had diabetes and lower scores with those not having diabetes with higher scores (59.8) than those who had (27.2). Those with stroke were more likely to have lower PASE scores (27.2) than those who have not had stroke (52.5).

Table 3: Association between HRQoL and socio-demographic characteristics

	HRQoL grade		Total n(%)	X^2	p-value
	Good n(%)	Poor n(%)			
Age group (Years)				21.656	<0.001*
60-64	84(91.3)	8(8.7)	92(100.0)		
65-69	67(89.3)	8(10.7)	75(100.0)		
70-74	40(87.0)	6(13.0)	46(100.0)		
75-79	16(64.0)	9(36.0)	25(100.0)		
≥80	18(64.3)	10(35.7)	28(100.0)		
Mean±SD	67.66±6.5	73.02±7.8		-4.692#	<0.001*
Gender				0.013	0.908
Male	172(84.7)	31(15.3)	63(100.0)		
Female	53(84.1)	10(15.9)	203(100.0)		
Marital status				5.386	0.021*
Married	137(89.0)	17(11.0)	154(100.0)		
Widowed	88(78.6)	24(21.4)	112(100.0)		
Family setting				4.330	0.037*
Monogamous	114(80.3)	28(19.7)	142(100.0)		
Polygamous	111(89.5)	13(10.5)	124(100.0)		
Employment status				13.774	<0.001*
Employed	151(91.0)	15(9.0)	166(100.0)		
Retired	74(74.0)	26(26.0)	100(100.0)		
Monthly income/Pension (Naira)				10.334	0.035*
≤20,000	167(81.1)	39(18.9)	206(100.0)		
21,000-50,000	37(100.0)	0(0.0)	37(100.0)		
51,000-80,000	11(91.7)	1(8.3)	12(100.0)		
>80,000	10(90.9)	1(9.09)	11(100.0)		

= Independent student t-test *= significant

Table 4: Association between HRQoL and prevalence of chronic NCDs

Variable	HRQoL grade		Total	X^2	p-value
	Good	Poor			
Hypertension				4.835	0.028*
Yes	135(80.8)	32(19.2)	167(100.0)		
No	90(90.9)	9(9.1)	99(100.0)		
Diabetes				1.270	0.260
Yes	29(78.4)	8(21.6)	37(100.0)		
No	196(85.6)	33(14.4)	229(100.0)		
Stroke				7.206	0.007*
Yes	12(63.2)	7(36.8)	19(100.0)		
No	213(86.2)	34(13.8)	247(100.0)		

* = significant

Table 5: Association between PASE scores and socio-demographic characteristics

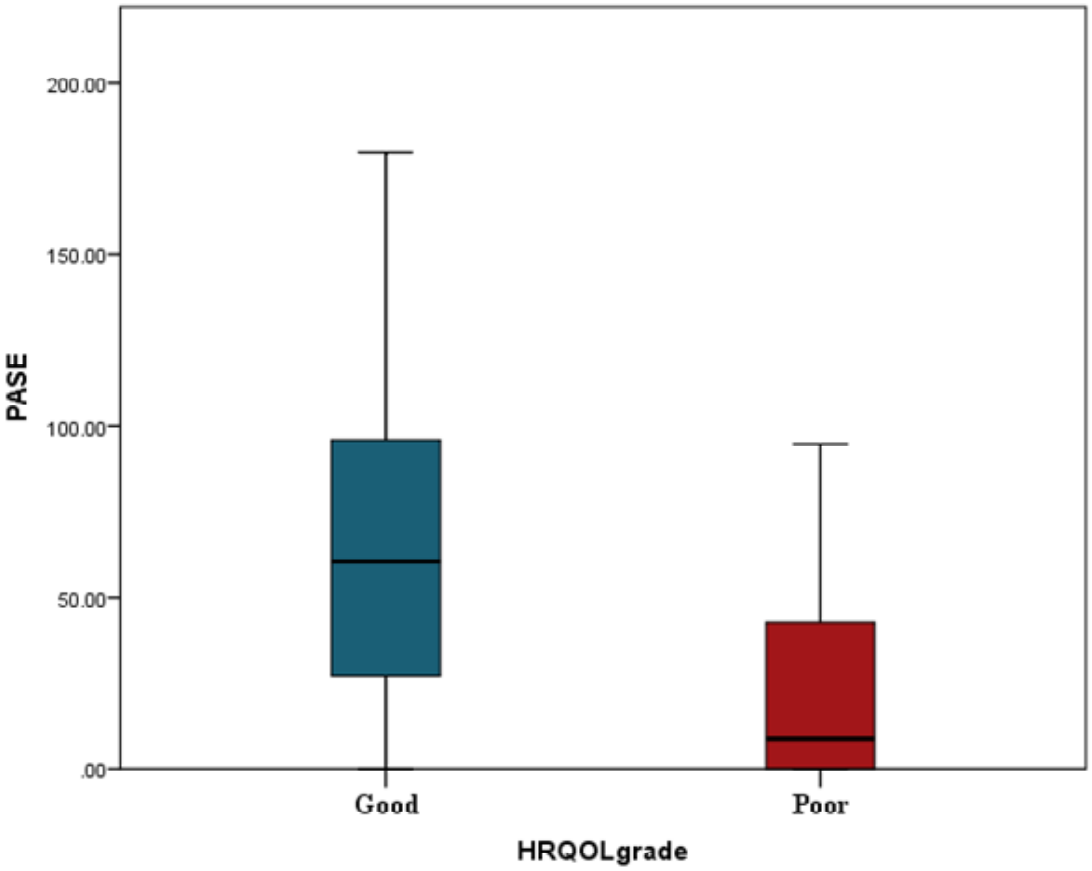
Variable	Median (Q1, Q3)	U-value	p-value
Age group (Years)		66.906#	<0.001*
60-64	67.6(36.6, 100.7)		
65-69	60.9(34.8, 102.6)		
70-74	32.0(7.6, 59.1)		
75-79	29.5(2.2, 53.2)		
≥80	3.36(0.0, 27.2)		
Gender		-3.650	<0.001*
Male	23.9(4.5, 60.9)		
Female	60.9(27.2, 92.7)		
Marital status		-2.261	0.024*
Married	60.9(25.4, 93.2)		
Widowed	33.6(10.9, 69.4)		
Highest level of education		11.626#	0.009*
None	42.6(11.2, 70.3)		
Primary	45.2(17.3, 69.4)		
Secondary	48.0(19.2, 96.7)		
Tertiary	92.7(60.9, 105.2)		
Employment status		-7.577	0.001*
Employed	63.7(35.9, 100.0)		
Retired	25.0(0.0, 44.4)		
Monthly income/ Pension (Naira)		12.053#	0.007*
≤20,000	42.6(12.8, 67.9)		
21,000-50,000	66.2(32.8, 105.2)		
51,000-80,000	68.6(20.7, 122.6)		
>80,000	92.7(29.5, 105.1)		

# = Kruskal Wallis test; * = significant; U= Mann-Whitney U test;
Q1= 25th percentile; Q3= 75th percentile

Table 6: Association between PASE scores and prevalence of chronic NCDs among respondents

Variable	Median (Q1, Q3)	U-value	p-value
Hypertension		-2.661	0.008*
Yes	42.6(13.8, 67.6)		
No	63.4(25.0, 102.3)		
Diabetes		-3.373	0.001*
Yes	27.2(4.8, 42.6)		
No	59.8(25.0, 93.4)		
Stroke		-1.959	0.050
Yes	27.2(2.2, 60.9)		
No	52.5(25.0, 87.4)		

*= significant; U= Mann-Whitney U test; Q1= 25th percentile; Q3= 75th percentile



Mann-Whitney U= -5.535, p<0.001*

Figure 2: Box plot showing association between PASE scores and HRQoL of respondents

Discussion

The respondents' age ranged from 60 to 90 years with a mean age of 68.5 years. This is similar to that of the study done among elderly Palestinians where the mean age was 68.2 years and this may be as a result of both studies having similar age range of respondents (60-90 years in current study versus 60-91 years in Palestinian study).[28] However there is a slight difference with the findings of the study done in Ontario as the mean age was 72.1 and this may be due to the Ontario study respondents being meal delivery volunteers.[29]

Majority of the respondents were females (76.3%) which is consistent with the study done in Malaysia where 75.8% of respondents were females and this may be as a result of both studies used the same inclusion criteria- those aged 60 years and above.[30] This was not similar to the study done in Italy as there was no significant difference in gender population (Males= 50.5%) and the reason for this may be attributed to the difference in the age bench mark for the respondents (60 years and above for current study versus 55-75years for the study done in Italy).[31]

This study also found that majority of the respondents (36.8%) had no formal education and this finding is consistent with that of the study done in North Iran.[32] This similarity may be attributed to the fact that both studies were done in developing countries. Majority of respondents had a monthly income/pension of 20,000 naira and below (77.4%) and this is similar to the study done in South-western Nigeria where 66.1% of the respondents earned 20,000 naira and below.[24] This similarity may be due to the fact that both studies were conducted among elderly that reside in Nigeria.

The majority of respondents were not physically active with an average overall PASE score of 46.5 with a leisure time activity domain having an average score of 10.9, household activity domain having an average score of 30.0 and work-related activity domain having an average score of 0.0. This is similar to a study done in a health clinic in Northern Iceland where the average overall score, the leisure time activity domain score, the household activity domain score, and the work related activity domain scores were 73, 11, 58 and 4.5 respectively.[33] This similarity may be attributed to the fact that both studies were carried out in health facilities. However,

comparing the results of this study to a study done in Malaysia among 33 elderly, the current study found that respondents were not physically active as the average overall PASE score in the study done in Malaysia was 167.9 which is much higher.[30]

This may be attributed to the fact that there was a significant difference in the sample size in both studies (266 in this current study versus 33 in the study done in Malaysia).This study also found that the those within the younger age groups (60-64; 65-69 years) had higher average PASE scores than those that fell within the older age groups (70-74; 75-79; e" 80 years) with women having higher scores than men and this is in line with a study done in Greece among 591 residents.[34] This similarity may be attributed to the fact that both are cross-sectional studies. The greatest contribution to total PASE scores was from household activities, which is approximate to those in the studies done in Northern Iceland and Anambra.[33,35] This similarity may be due to all three studies having more females than males as females tend to be more involved in household activities.

In this study, the range of the HRQoL scores were from 55.1±48.8 to 89.1±22.7 with a total SF-36 score of 71.2±19.2. This was higher when compared to a study done in Iran among 220 elderly where the total HRQoL score was 44 and the range of sub-domain scores were 30.7 to 52.9.[32] This contrast may be as a result of the study in Iran using elderly who reside in nursing homes in addition to those who reside in their homes while this study used patients attending PHC centers. This study also showed advancing age had a role to play in the HRQoL score as a higher percentage of those who fell within the younger age group (60-64; 65-69, 70-74 years) had good HRQoL when compared to those aged 75 years and above. The finding in this study was consistent with a study by Lima MG et al in Brazil.[36] This may be because as one ages, chronic diseases, which could be a limitation, sets in. This study also found that the physical component summary score (PCS) was 61.5±23.1. This finding was consistent with that of the study done in South-west Nigeria by Ogunyemi et al where non-institutionalized elderly had a PCS score of 61.9±18.1.[24] This similarity may be attributed to the fact that PCS scores were of elderly that reside at home as opposed to a nursing home.

The mental component summary (MCS) in this study is 81.0±19.5. This was seen to be higher than the study done in Iran (MCS score = 63.8±23.8) and this may be attributed to the disparity in the benchmark used to define the elderly age group as the study in Iran used those aged 65 years and older while this study used those aged 60 years and older.[32] The MCS score was higher than the PCS score and this finding was consistent with that done in South-western Nigeria (67.9 in this current study versus 61.9 for non-institutionalized group of the study done in South-western Nigeria; 55.2 in this current study versus 50.6 in institutionalized group in the study done in South-western Nigeria) and Iran (63.8 in this current study versus 55.0 in the study done in Iran).[24,32] This may be attributed to the fact that most elderly had a generally positive outlook when dealing with issues relating to emotional health.

This study also found that those who were married had better HRQoL than those who were widowed. This may be as a result of the widowed feeling more isolated, lonely with a lack of companionship and this is consistent with findings of the study done in Tehran, Iran as those who were married, or had never been married had better HRQoL than those who were divorced or widowed.[32] This study showed no statistically significant relationship with the respondents' HRQoL scores and level of education and this finding is consistent with the study done by Ogunyemi et al.[24] However this is in contrast with the study done in Iran which found significant association and this could be because this current study and the study by Ogunyemi et al were carried out in Nigeria while the other was done in Iran.[32] This study also found that there was association between presence of NCD and poor HRQoL and this is consistent with studies done in south-western Nigeria and among Palestinians.[24,28]

This study found that most of the respondents with poor HRQoL had low PASE scores which indicates that they were not physically active and this may be as a result of the health benefits of physical activity. This finding is in line with the results of a study done among elderly Korean people where it was found that respondents who met the guidelines for physical activity reported having no issues in their HRQoL.[37]

Respondents of this study had either hypertension, diabetes or stroke as a chronic NCD.62.8% of the respondents had hypertension and 7.1% had stroke. This finding was in line with a study done among 840,319 elderly that visited the general practitioners in 2014 where hypertension was the most common chronic NCD with a prevalence of 66.0% and the prevalence of stroke was 5.8%.[38] This similarity may be as a result of both studies being done in health facilities. However, these finding were not similar to that of a study done in Haikou, Hainan province China as the prevalence of hypertension and stroke were lower with 26.0% and 1.9% respectively.[39] This difference may be as a result of the study done in Hainan province, China being a comparative study (rural versus urban).

This study also found that the prevalence of diabetes was 13.9% which is consistent with the findings of a study done in seven selected Indian states by United Nations population fund where the prevalence of diabetes was 10.1%.[40] This similarity may be as a result of both studies using the same bench mark to define the age group of elderly, which was those aged 60 years and above. This study also found that the prevalence of cancer, COPD and cardiovascular diseases were 0.0%, 0.0% and 7.1% respectively. However this was contrasting with the findings in a study done in Uyghur ethnicity, Xinjiang China where the prevalence of cancers, COPDs and cardiovascular diseases were 11.59%, 9.78% and 21.89% respectively.[41] This may be attributed to the difference in sample size (266 in this current study versus 1329 in the study done in India). This current study also found that those who did not have hypertension, stroke or diabetes had better HRQoL scores and higher PASE scores.

Conclusion

This study revealed low physical activity levels with 68.0%, 92.5% and 98.5% of respondents who did not engage in any form of moderate, vigorous and muscle-strengthening sport or recreational activities in the past 7 days, contrary to WHO guidelines. The HRQoL of most of the respondents were good but it was shown that sub-domains relating to physical health had lower scores than sub-domains relating to mental health. Most respondents who had poor HRQoL had low level of physical activity. The prevalent NCDs were hypertension, diabetes and stroke. Poor HRQoL and low PASE scores were found to have a significant association with the presence of chronic NCDs

Recommendations

Interventions should be tailored to promote physical activity levels and discourage sedentary lifestyle among the elderly

Author's contributions

BAA conceived, designed, analyzed, interpreted the data and wrote the initial and final draft of the manuscript. OIT collected, organized, interpreted the data and conducted literature review and revised the manuscript. EOA provided research materials and revised the manuscript. ATB provided research materials, conducted systematic reviews and revised it for important intellectual content. OAO organized data and revised the manuscript. IOB reviewed the questionnaires and revised the manuscript.

All authors have critically reviewed and approved the final draft and are responsible for the accuracy and integrity of the content and similarity index of the manuscript.

Acknowledgement: Authors thank the staff of Ejire and Oshodi-Isolo PHCs for their support

Conflict of Interest: There is no conflict of interest

Source of Funding: This research did not receive any grant from funding agencies

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Received = 14/10/2021
Accepted = 27/06/2023