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Rural–urban differences in quality of life and associated factors among community-dwelling older persons in Oyo state, South-Western Nigeria

Eniola O. Cadmus[1,2] · Lawrence A. Adebusoye[2] · Eme T. Owoaje[1]

Abstract

Aim The decline of health and functional status as a result of old age makes it necessary to assess the Quality of Life (QoL) among older persons. There is, however, limited information in this regard from low and middle-income countries such as Nigeria. This study compares the QoL and associated factors among rural and urban community-dwelling older persons (≥ 60 years) in Oyo State, Nigeria.

Subject and methods A cross-sectional, comparative community-based study was carried out using an interviewer-administered, semi-structured questionnaire. The QoL was determined using the World Health Organisation Quality of Life Brief Scale (WHOQOL-BREF). Data were analysed using Stata version 14 at $p < 0.05$.

Results Overall, 1,180 (588 urban and 592 rural-dwelling) respondents were interviewed. Females constituted more than half of the respondents in both communities, accounting for over two thirds (69.2%) of the population. The mean QoL scores were similar in the psychological (54.2 ± 7.4) and environmental (54.7 ± 9.5) domains. However, the mean score for the physical domain was 69.2 ± 17.0 and 74.1 ± 12 for the social domain. There was no statistically significant difference between mean scores of the QoL in the two locations except in the environmental domain ($p < 0.05$). Good self-rated health was a common positive predictor of higher mean scores across the four domains in both the rural and urban settings ($p < 0.05$).

Conclusion The rural–urban differences in the mean quality of life scores in the environmental domain in the study and poorer scores in the psychological and environmental domains necessitate areas for targeted intervention and more in-depth research.

Keywords Older persons · Quality of life · Rural–urban · Community-based survey · Southwest Nigeria

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✉ Eniola O. Cadmus
    eniyolacadmus@gmail.com

Extended author information available on the last page of the article

1 Introduction

Life expectancy has generally increased in many countries worldwide (United Nations 2015, 2020b; United Nations Department of Economic and Social Affairs Population Division 2019; World Health Organisation 2002). As a result, many individuals who have attained the age of 60 are expected to live for 20 years or more (Tang and Pickard 2008; United Nations 2015; United Nations Department of Economic and Social Affairs Population Division 2019; World Health Organization 2015). This increase in the proportion of persons aged 60 years and over, otherwise termed "Population Ageing", is a huge demographic achievement but may constitute a social and economic problem if not well managed (Spijker and MacInnes 2013; United Nations 2020a; World Health Organisation 2002; World Health Organization 2015).

Adequate preparations for ageing related socio-economic challenges constitute a significant step towards achieving the sustainable development goals of the 2030 Agenda for Sustainable Development (United Nations 2016). In a recent pronouncement, the United Nations has declared a Decade of Healthy Ageing from 2021–2030. The decade is to enable targeted research and implementation of policy for healthy ageing and achievement of laid down sustainable development goals (United Nations 2020a, 2016). According to global estimates by the World Health Organisation (WHO), in 2015, older persons numbered about 900 million (World Health Organization 2015). By the year 2030, which marks the end of the United Nations Decade of Healthy Ageing, it is estimated that the proportion of older persons will increase to 1.4 billion (United Nations 2020a). Further, by 2050 this number will grow and double yet again, numbering over 2 billion (United Nations 2015; United Nations Department of Economic and Social Affairs Population Division 2019).

In Africa, the total number of persons aged 60 years and above in 2015 was 46 million (United Nations 2015; United Nations Department of Economic and Social Affairs Population Division 2019). This number is estimated will increase to 105 million by 2030. By 2050, the proportion would have doubled and will number about 220 million (United Nations 2015, 2020a; United Nations Department of Economic and Social Affairs Population Division 2019). The East African region has the highest number of older persons (18.9 million), followed by Northern Africa (17.9 million) and western Africa (16 million).

Nigeria, the most populous country in sub-Saharan Africa and the seventh in the world, has about 4.5% of its 180 million population aged 60 years and above (Harrington and Kaye 2009; United Nations Department of Economic and Social Affairs Population Division 2019). By the year 2030, the proportion of older persons in the country is expected to rise and be about 12 million (United Nations 2015; United Nations Department of Economic and Social Affairs Population Division 2019). Although old age is associated with increased disability and reliance on others for support, the benefits of increased life expectancy will be futile if not associated with provisions for improved Quality of Life (QoL).

According to the WHO, QoL refers to "an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns" (Gholami et al., 2013; Silva et al. 2014; WHO 1997). In other words, the term QoL refers to "the degree of satisfaction or dissatisfaction felt by individuals regarding various aspects of their lives" (Farquhar 1995). Concerning health, QoL encompasses both general health and functional status (Bowling et al. 2003). Therefore, the expected decline of either or both entities with age makes it necessary to assess QoL among older persons to inform policy and practice.

Research has shown that health is positively related to the quality of life lived (Farquhar 1995; Van Nguyen et al. 2017), as well as social relationships, activities and perceived health status (Awobiyi 2014; Bowling et al. 2003; Soosova 2016). Perceived good QoL has been reported to be associated not only with physical health or the presence of morbidity but also factors such as younger age, male sex, a higher level of educational attainment, employment status, urban location and higher wealth index (Akinboro et al. 2014; Folasire and Folasire 2012; Qadri et al. 2013; Rajasi et al. 2016; Talarska et al. 2018). Other factors associated with improved QoL among older persons include staying in their homes, having a good relationship with family and friends in the neighbourhood, being financially viable and being independent. (Bowling et al. 2003).

Evidence suggests that the provision of support for older persons improves their quality of life. However, there are arguments about what constitutes QoL and the benefits of its subjective or objective measurements. Subjective measures rely solely on how the individual perceives his/her status in life (Bowling et al. 1993; Van Nguyen et al. 2017). Such measures are beneficial for providing much needed care, support and services for older persons and programme evaluation of the effects. Also, for older persons, targeted programmes to improve their well-being will be futile without a basic understanding of factors that influence their QoL. To date, research on QoL among older persons in many low- and middle-income countries (LMIC), including Nigeria, have been facility-based, focused mainly on disability, vulnerability, morbidity and mortality patterns (Akinboro et al. 2014; Folasire and Folasire 2012; Gureje et al. 2006; Maniragaba et al. 2018; Olaleye and Hamzat 2017; Qadri et al. 2013). Fewer still have explored factors that influence the QoL of older persons within the individual domains of a subjective assessment, especially in the community setting.

The recent United Nations (UN) policy on sustainable development goals calls for inclusiveness in providing health for all segments of the society, including older persons (United Nations 2016). Achieving the highest possible level of QoL is a crucial endpoint while caring for older persons and may be used to assess the quality of care given and monitor interventions. This paper, therefore, compares the domain differences in QoL and associated factors among rural and urban community-dwelling older persons in Oyo State, southwestern Nigeria.

2 Methodology

This study is part of a more extensive community-based, cross-sectional study that assessed older persons' long-term care preferences and their desire to age in place (Cadmus et al., n.d.). The study utilised a mixed-methods approach. However, only the quantitative aspect will be discussed in this paper. Study participants were older persons aged 60 years and above on their last birthday. One rural (Ibarapa Central) and one urban local government area (Ibadan North) in Oyo State, southwestern Nigeria, were selected for the study. The residents are mainly of Yoruba ethnicity, similar culturally and speak the same language, Yoruba.

The urban community was selected from the Ibadan North Local Government Area (LGA), located in Ibadan, the capital city of Oyo State. Recent estimates suggest that the LGA has about 432,900 people, of which about 4% (18,524) are aged 60 years and above (National Bureau of Statistics 2016). The study was conducted in Ward 3, selected purposively out of the 12 wards in the LGA. Based on a demographic survey conducted in

2013, Ward 3 has an estimated 30,861 and comprises the settlements of Yemetu, Aladorin, Adeoyo, and part of Oje. The rural community was selected from Ibarapa Centra LGA which has its headquarters in the town of Igbo Ora. Likewise, recent estimates suggest the LGA has about 140,900 people, of which about 4% (5,479) are aged 60 years and above (National Bureau of Statistics 2016).

Respondents for the study were chosen through a multi-stage sampling procedure to select LGA, wards, settlements, and households. First, two LGAs, one rural and one urban, were selected because they had been previously mapped and listed. Secondly, one ward was selected from each LGA based on the same criteria for the LGA. Next, four enumeration areas /settlements were also chosen by balloting in each of the selected wards. The selection was made without replacement from the list of enumeration areas/ settlements. Mapping and listing of the selected enumeration areas have already been carried out, as earlier stated. Therefore, households with potential individuals aged 60 years and above were identified from the demographic survey.

The survey data was used as a sample frame to select study participants. All consenting men and women aged 60 years and above present in each household in the selected settlements were then interviewed after informed consent was obtained. Similar to previous studies, if the primary respondent was unavailable after three repeated calls or refused to participate, no replacement was made within the household (Gureje et al. 2008; Xavier et al. 2010). In households that had more than one eligible participant, only one participant was selected by balloting.

3 Inclusion and exclusion criteria

3.1 Eligibility criteria

For this study, adults aged 60 years and above and living continuously in the selected households for at least 12 months preceding the time of the survey were eligible to participate in the survey (Gomez-Olive et al. 2018).

3.2 Exclusion criteria

Older persons, incapacitated in any form or who, due to health issues such as dementia, speech or hearing disorders and other communication problems, could not provide information themselves were excluded from the study.

3.3 Data collection

Data for the study were collected with a questionnaire administered by trained research assistants after obtaining consent. Ten research assistants (RA) with the minimum educational attainment of at least a secondary school leaving certificate were trained over two days in the proper approach to administering the questionnaires. Also, two scouts domiciled in the respective LGAs were recruited to guide the teams on the field. Each selected household was visited, and face-to-face interviews were conducted with the selected respondents.

The research instrument was translated to Yoruba, the local language, for ease of communication. The tool was then back-translated to English to ensure the original

meanings were maintained before administration. The questionnaire was pre-tested among older persons in a different LGA from those selected for the study. Following the pre-test, ambiguous questions were rephrased or removed where necessary. The interviews were conducted in the language preferred by the respondents.

The sample size for the study was determined using the sample size calculator in Stata Version 14 and the formula for comparing two proportions assuming a difference of 10%, power of 90%, and α of 5% (StataCorp 2015). The sample size calculation for the more extensive study was based on the proportion of older persons who desired to age in place from a previous study (p = 48%) (Boldy et al. 2011). Data were collected over one month in July 2018 using the Research Electronic Data Capturing ^{R} (REDCap) platform (Harris et al. 2009) and analysed using Stata version 14 (StataCorp. 2015). Inferential statistics to test for associations between variables were done using the chi-square test. Variables significant at 10% were entered into a logistic regression model. The level of statistical significance was set at 5%.

The outcome variable for this study was QoL and was assessed using the World Health Organisation Quality of Life Brief Scale (WHOQOL-BREF) instrument (Silva et al. 2014; WHO 1997). The instrument is the most commonly used tool in research for subjective assessment of health-related QoL. Four domains were assessed, each measuring a different aspect of physical health, mental/ psychological health, social relationships, and the environment. The instrument has been previously validated among older persons in Nigeria with good reliability (Cronbach alpha 0.86) (Gureje et al. 2008).

The domain scores of QoL are scaled in a positive direction. As such, higher scores in a domain indicate a higher quality of life in that domain. Each of the WHOQOL-BREF domains provides information about the designated aspect of the individual's life. The physical domain assesses the effect of pain on functioning and the need for medical treatment. Also, the quality of sleep, satisfaction with productivity and ability to work are measured (Silva et al. 2014; WHO 1997).

On the other hand, the psychological domain provides information about how much joy is felt by an individual, experience of depression, anxiety and devastation, all of which are common with progressing age. Furthermore, information about problems with concentration, acceptance by the individual of his or her appearance and self-satisfaction were measured. Likewise, the social domain assesses the interpersonal relationship and the individual's satisfaction with the support received. Lastly, the environmental domain measures the individual's perception of safety in daily life, financial standing, ability to develop interest or satisfaction with the place of residence (Silva et al. 2014; WHO 1997).

Similar to population-based research in other LMIC, this study used self-rated health status as a predictor of morbidity and mortality (Debpuur et al. 2010). Self-rated health was measured by asking individuals to rate their health on a five-point Likert scale: excellent, very good, good, fair and poor. From the participant responses, a dichotomous measure was created. The measure was coded one if the response was 'excellent', 'very good' or 'good' and 0 if the response was 'fair', or 'poor'. Having less than good (i.e. fair or poor) self-rated health was categorised as perceived poor health status and those with good or better health as perceived good health status.

Similar to the WHO Study on Global Ageing and Health (SAGE) questionnaire, participants were screened before the interview using two questions to assess their cognition. Once the research assistant was satisfied that there was no impairment, the questionnaires were then administered. However, aside from the 12 who refused participation, none were excluded. Those who declined participation did so because they were just not interested.

The categorical variables were summarised using proportions, while the continuous variables (including QoL scores) were summarised using means and standard deviation. These were compared using Pearson's chi-square test ($\chi 2$) or Fisher's exact test. The student t-test was used to analyse the statistical difference between the mean QoL scores and dichotomous variables. The Spearman's -Rho correlation test was used to test the association between the WHOQOL-BREF domains and sociodemographic factors.

4 Results

A total of 1192 older persons (592 rural vs 600 urban) were approached to participate in the study; 12 (8 urban 4 rural) refused participation giving a total response rate of 99.0%. The response rate in the urban area was 98.6%, and in the rural area, 99.3%. After uploading and initial data cleaning, 20 records were voided because of the incompleteness of the data collected. Eventually, the data from the 1180 completed questionnaires were analysed. Among the 1180 respondents who completed their interview, 588 (49.8%) were urban dwellers, while 592 (50.2%) resided in the rural area. As shown in Table 1, females constituted more than half of the respondents in both communities, accounting for 406 (69.1%) and 417 (70.0%) in rural and urban locations. The mean age for the total

Table 1 Socio demographic characteristic of respondents by location

Variable	Rural = 588 n (%)	Urban = 592 n (%)	Total = 1180 N (%)	χ^2	p-value
Gender					
Male	182 (31.0)	175 (30.0)	357 (30.3)		
Female	406 (69.1)	417 (70.0)	823 (69.2)	0.30	0.60
Age (years)					
60–69	189 (32.1)	248 (41.9)	437 (37.0)		
70–79	221 (37.6)	200 (33.8)	421 (35.7)		
≥ 80	178 (30.3)	144 (44.7)	322 (27.3)	12.6	< 0.001*
Ethnic group					
Yoruba	586 (99.7)	575 (97.1)	1161 (98.4)		
Non Yoruba	2 (0.3)	17 (2.9)	19 (1.6)	11.9	< 0.001*
Marital status					
Not currently married	307(52.2)	358 (60.4)	665 (56.4)		
Currently married	281(47.8)	234 (39.6)	515 (43.6)	8.2	< 0.001*
Educational status					
Had no formal Education	476 (81.0)	294 (49.7)	770 (65.3)		
Had formal education	122 (19.0)	298 (50.3)	410 (34.7)	127.0	< 0.001*
Employment status					
Currently working	325 (55.3)	259 (44.4)	584 (49.5)		
Not currently working	263(44.7)	333 (56.2)	586 (50.5)	15.7	< 0.001*
Housing ownership					
Yes	394 (67.0)	365 (61.4)	759 (64.3)		
No	194 (33.0)	227 (53.9)	421 (35.7)	3.7	0.06*

population was 73.2 ± 9.3 years. However, rural respondents were significantly older than urban respondents with mean ages of 74.2 ± 9.5 years compared to 72.3 ± 8.9 years, respectively ($p < 0.05$).

The age group 60–69 years had the largest representation in the urban location, 248 (41.9%), while those aged 70–79 years had the highest frequency of 221 (52.5%) among the rural dwellers. Virtually all the respondents were of Yoruba ethnicity in rural 586 (99.7%) and urban areas 592 (97.1%). A higher proportion of rural respondents were currently in a relationship or married 281 (47.8%) compared to the urban respondents 234 (39.6%). Also, a higher proportion of rural respondents were still working, 325 (55.3%) compared to the urban respondents 259 (43.8%). The majority of the respondents, 476 (81.0%) in the rural areas, had no formal education compared to about half, 294 (49.7%) of the urban respondents. The differences in marital status, employment and educational status by location were statistically significant ($p < 0.05$).

As shown in Table 2, the mean scores of QoL were highest in the social domain (74.1 ± 12.1) followed by the physical domains (69.2 ± 17.0). In contrast, the scores were lower and similar in the environmental (54.2 ± 7.4) and psychological domains (54.2 ± 7.4), respectively. There was no statistically significant difference between mean scores of the QoL in the two locations except in the environmental domain.

Bivariate analysis of factors associated with the physical domain showed differences between rural and urban dwellers (Table 3). In the rural area, factors associated with higher mean scores include younger age of the respondents (< 70 years), being married, employed and having good self-rated health (SRH). These findings were statistically significant ($p < 0.05$). For urban respondents, statistically significant differences were observed among younger, married, and educated respondents. Other factors include currently being employed, having assistance at home and good SRH ($p < 0.05$) (Table 3). However, as shown in Table 4, positive predictors of higher mean scores in the physical domain in the rural area were younger age [OR: −2.47 (95% CI: −4.77–0.17)], good SRH [OR: 19.2 95% (CI: 16.92–21.40)], present employment, [OR: 6.42 (95% CI:4.29–8.55)] and homeownership, [OR −2.51: (95% CI: −4.60–−0.41)]. In the urban area, positive predictors were also younger age, [OR: 2.81 (95% CI: −5.34–−0.03)], currently being married, [OR: 3.1 (95% CI: 0.48–5.74)], being educated, [OR 3.1 (95% CI: 0.66–5.44)], having good self-rated health [OR: 23.01(95% CI: 20.5–25.5)] and presently being employed [OR: 4.7 (95% CI: 2.33–7.11)] (Table 4).

Factors shown to be statistically significant on bivariate analysis in the psychological domain among rural respondents were being employed, living in owned housing and good SRH ($p < 0.05$) (Table 3). Among urban respondents, the only factor shown to be statistically significant in the domain was good SRH. However, the positive predictors of higher

Table 2 Distribution of Means and standard deviations of transformed QoL scores by location

QoL Domains Transformed Mean Scores (0–100)	Rural = 588 Mean (± SD)	Urban = 592 Mean (± SD)	Overall = 1180 Mean(± SD)	t-statistic	p-value
Physical	69.3 (15.7)	69.2(18.3)	69.2 (17.0)	0.11	0.90
Psychological	54.3 (7.1)	54.0 (7.7)	54.2 (7.4)	0.58	0.29
Social	74.2 (11.0)	74.0(13.1)	74.1 (12.1)	0.74	0.37
Environmental	55.4 (8.5)	54.0 (10.3)	54.7 (9.5)	2.47	0.01*

*Significant at $p < 0.05$

Table 3 Sociodemographic characteristics of respondents and mean scores in the Physical and Psychological Domains by location

Domain	Physical Domain						Psychological Domain					
Location	Rural			Urban			Rural			Urban		
Variable	N	Mean (SD)	p-value	N	Mean (SD)	p-value	N	Mean (SD)	p-value	N	Mean (SD)	p-value
Age category												
≥70 years	399	67.4 (16.2)		344	66.7 (18.4)		399	54.1 (7.2)		344	54.3 (7.9)	
<70 years	189	73.3 (13.9)	<0.001*	248	72.5 (17.5)	<0.001*	189	54.7 (6.9)	0.31	248	53.7 (7.4)	0.35
Sex												
Male	182	69.4 (15.9)		175	71.1 (19.9)		182	54.1 (7.7)		175	54.4 (8.1)	
Female	406	69.2 (15.7)	0.90	417	68.4 (17.5)	0.09	406	54.4 (6.8)	0.66	417	53.9 (7.6)	0.44
Marital status												
Currently married	281	71.5 (15.5)		234	73.2 (17.8)		281	54.6 (7.3)		234	54.1 (7.7)	
Currently unmarried	307	67.2 (15.7)	<0.001*	358	66.5 (18.1)	<0.001*	307	54.0 (7.0)	0.30	358	54.0 (7.7)	0.86
Formal education												
Yes	112	71.8 (14.6)		298	72.3 (18.0)		112	55.0 (7.3)		298	53.7 (8.0)	
No	476	68.7 (16.0)	0.06	294	65.9 (17.9)	<0.001*	476	54.1 (7.0)	0.27	294	54.4 (7.4)	0.30
Self–rated health												
Good	425	75.0 (12.1)		417	76.3(12.8)		425	55.6 (6.8)		417	55.3 (7.4)	
Poor	163	54.3 (14.2)	<0.001*	175	52.2 (18.0)	<0.001*	163	50.8 (6.6)	<0.001*	175	51.0 (7.5)	<0.001*
Occupational status												
Employed	325	74.4 (12.7)		259	74.2 (15.4)		325	55.3 (7.2)		259	54.5 (7.6)	
Unemployed	263	63.0 (16.9)	<0.001*	333	65.3 (19.3)	<0.001*	263	53.0 (6.8)	<0.001*	333	53.6 (7.8)	0.17
Home Ownership												
Owner occupied	394	68.8 (15.6)		365	69.1 (17.2)		394	54.7 (7.1)		365	54.4 (8.0)	
Rented	194	70.3 (16.0)	0.29	227	69.2 (19.9)	0.10	194	53.4 (7.0)	0.05*	227	53.5 (7.2)	0.21
Home assistance												
Yes	469	69.0 (16.3)		442	68.0 (18.7)		469	54.4 (7.3)		442	53.8 (7.6)	
No	119	70.5 (13.3)	0.33	150	72.7(16.5)	0.01*	119	53.7 (6.4)	0.30	150	54.8 (8.1)	0.15

*Significant at p<0.05

scores in this domain were good self-rated health for the rural dwellers [OR: 4.43 (95% CI: 3.17–5.69)] and the urban dwellers [OR: 4.30 (95% CI: 2.95–5.64)].

In the social domain, factors associated with higher scores among the rural respondents were employment, marital or relationship and good SRH (p < 0.05). Among the urban respondents, factors associated with significant differences in the social domain were age, employment, marital status, level of education and good SRH (Table 5) (p < 0.05). However, positive predictors of higher mean scores in the domain for the rural dwellers were currently being married or in a relationship [OR: 2.09 (95% CI: 0.26–3.92)], being employed [OR: 2.65 (95% CI: 0.83–4.47)] and having good SRH [OR:7.48 (95% CI:5.57–9.40)]. Nevertheless, a positive predictor of higher mean scores in the social domain for the urban dwellers was being educated [OR:2.48 (95% CI: 0.33–4.62)], being employed [OR:2.13 (95% CI: 0.04–4.23] [OR:9.22 and good SRH [OR:9.22 (95% CI: 7.02–11.42)] (Table 6).

In the environmental domain, factors statistically significant on bivariate analysis among the rural respondents gender, maritalstatus, employment status and good SRH, Among urban respondents, significant factors in the domain were gender, maritalstatus, occupation, educational status, and SRH (p < 0.05). However, the only predictor for the domain in the rural area was good SRH. [OR: 6.58 (95% CI: 5.12–8.05)]. Among the urban dwellers, positive predictors were being educated [OR: 3.68 (95% CI: 1.45–4.76)], having good SRH [OR: 7.29 (95% CI: 5.59–8.99)] and ownership of present accommodation [OR: 2.27 (95% CI: 0.65–3.89)].

5 Discussion

This study aimed to assess the factors associated with the four domains of the WHOQOL instrument among rural and urban community-dwelling older persons in a low-income setting. The domain with the highest score was the social domain which is not surprising. In the traditional African setting, the family is expected to provide care and support for older persons. There is a high level of social, intergenerational and community support in such settings (Aboderin 2004; Ajomale 2007; Amaike 2014). The second most highly rated domain was the physical domain and may result from a higher proportion of respondents in the young-old age group (60–70 years) who may have a lower morbidity burden.

In this study, a good self-rated assessment of health was positively correlated with higher scores across all the domains of QoL as found in a similar survey (Soosova 2016). Furthermore, similar to previous research, the lowest scores were reported in the environmental domain (Talarska et al. 2018). A possible reason for this finding may be the lack of services specifically designed for older persons in this setting. Additionally, necessary infrastructural provisions and adaptability to enable an age-friendly environment have not yet been implemented. Other factors associated with good QoL were house ownership and being presently employed. This corroborates findings from other research and suggests that the wealth status of an individual is essential in overall QoL and perceived well-being (Maniragaba et al. 2018; Qadri et al. 2013; Rajasi et al. 2016).

There are other factors associated with higher ratings of QoL documented in both high, low- and middle-income countries (Bryla et al. 2013; Campo et al. 2014; Maniragaba et al. 2018; Qadri et al. 2013; Rajasi et al. 2016; Soosova 2016). For instance, gender has been reported in studies carried out in India and Uganda (Maniragaba et al. 2018; Qadri et al. 2013; Rajasi et al. 2016). However, there is no definite conclusion as some other studies have shown

Table 4 Combined Table: Adjusted predictors of Quality of Life for the Physical and Psychological domains by location

Domain	Physical domain						Psychological domain					
Location	Rural			Urban			Rural			Urban		
Variable	β-Coefficient	95% CI	P-value	β-Coefficient	95% CI	P-value	β-Coefficient	95% CI	P-value	β-Coefficient	95% CI	P-value
Age category												
≥70 years	−2.47	−4.77–0.17	0.04*	−2.81	−5.34–0.03	0.03*	0.05	−1.24–1.34	0.94	0.56	−0.78–1.90	0.42
<70 years	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Marital status												
Currently Married	2.08	−0.64–4.21	0.06	3.1	0.48–5.74	0.02*	0.04	−1.16–1.24	0.95	0.54	−0.87–1.95	0.46
Currently unmarried	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Formal education												
Yes	1.20	−1.49–3.88	0.38	3.1	0.66–5.44	0.01*	0.73	−0.77–2.24	0.34	−0.95	−2.26–0.35	0.15
No	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Self–rated health												
Good	19.20	16.92–21.40	<0.001*	23.01	20.5–25.5	<0.001*	4.43	3.17–5.69	<0.001*	4.30	2.95–5.64	<0.001*
Poor	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Occupational Status												
Employed	6.42	4.29–8.55	<0.001*	4.7	2.33–7.11*	<0.001*	1.41	0.21–2.60	0.02*	0.49	−0.80–1.76	0.46
Unemployed	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Home ownership												
Yes	−2.51	−4.60–−0.41	0.02*	0.48	−1.90–2.86	0.69	0.95	−0.77–2.24	0.34	0.56	−0.71–1.84	0.39
No	1 (ref)			1 (ref)			1 (ref)			1 (ref)		

*Significant at p<0.05

that females may report better quality of life compared to males (Bryla et al. 2013; Talarska et al. 2018) and vice versa (Van Nguyen et al. 2017). In this study, there were no gender differences. Likewise, the level of education has been shown to affect the measure of QoL. Like other research (Bryla et al. 2013; Talarska et al. 2018), this study shows that higher educational attainment is associated with higher mean scores in the QoL domains. Likewise, older age was reported to be predictive of higher mean scores of QoL in the physical domain, similar to findings from research in other parts of the world (Campo et al. 2014; Van Nguyen et al. 2017). This result may be because older individuals may be more accepting of their functional decline. Also, such individuals may readily have access to assistance from caregivers.

Marital status was a highly relevant factor across the QoL domains in other research (Maniragaba et al. 2018; Soosova 2016), as well as this study. A possible explanation may be that being married or in a relationship confers companionship and prevents isolation and loneliness. Furthermore, individuals in a relationship can also offer assistance to each other, which has been documented to improve the mental health status, QoL and subjective well-being (Maniragaba et al. 2018; Soosova 2016). In addition, similar to other study findings, formal education was shown to influence higher scores across the QoL domains (Bryla et al. 2013; Campo et al. 2014; Gureje et al. 2008). A possible reason for this finding may be that educational attainment is a recognised proxy for higher socio-economic standing. As such, individuals with higher wealth profiles are more likely to better take care of themselves and afford to pay for health care and other support needs. Likewise, the effect of work on health has also been documented (Campo et al. 2014; Gureje et al. 2008). In this study, being currently employed is predictive of higher mean scores across the different domains.

An individual's subjective rating of their health, that is, self-rated health is a reliable assessment of subjective well-being and QoL. Similar to other research (Campo et al. 2014; Gureje et al. 2006; Lasisi and Gureje 2015; Soosova 2016), good SRH was shown in this study to be a positive predictor of QoL across the four domains in both the rural and urban settings. Of note, however, in this study, homeownership is predictive of higher QoL scores in the physical domain aside from the other factors that cut across the study settings such as SRH, being married or in a relationship, and having a formal education. Particularly in the psychological domain, similar to other research (Maniragaba et al. 2018), living in an owner-occupied home was shown to be predictive of good QoL in the domain. A possible explanation for this finding may be because such an individual is not expected to pay rent. Many older persons are no longer in active employment while those still working do so mainly for subsistence, and the returns are minimal because of diminished strength (Gureje et al. 2008).

Factors predictive of higher mean scores in the social domain, including currently being married and employed, are not surprising and similar to findings from other studies (Campo et al. 2014; Gureje et al. 2008; Maniragaba et al. 2018; Soosova 2016). This finding may be because these factors are associated with increased chances of socialisation, the formation of relationships and interactions with other people regularly.

Scores in the environmental domain had statistically significant differences in the mean scores across the two study settings. This finding may be a result of the differences in available infrastructure and services in the study settings. There is usually a wide difference between rural and urban settings and better QoL associated with the urban-dwelling (Gureje et al. 2008).

Table 5 Sociodemographic characteristics of respondents and mean scores in the Social and Environmental Domains by location

Domain	Social domain						Environmental domain					
Location	Rural			Urban			Rural			Urban		
Variable	N	Mean (SD)	p-value	N	Mean (SD)	p-value	N	Mean (SD)	p-value	N	Mean (SD)	p-value
Age category												
≥70 years	399	73.7 (10.9)		344	73.2 (12.5)		399	55.3 (8.9)		344	53.7 (10.7)	
<70 years	189	75.5 (11.3)	0.07	248	75.1 (13.9)	0.05*	189	55.3 (7.7)	0.78	248	54.4 (9.8)	0.45
Sex												
Male	182	75.0 (10.9)		175	74.8 (15.7)		182	56.7 (8.2)		175	55.8 (10.0)	
Female	406	73.9 (11.0)	0.25	417	73.7 (11.9)	0.33	406	54.8 (8.6)	0.01*	417	53.3 (10.1)	0.01*
Marital status												
Currently married	281	75.7 (11.0)		234	75.9 (14.7)		281	56.6 (8.5)		234	55.6 (9.9)	
Currently unmarried	307	72.9 (10.9)	<0.001*	358	72.8 (11.9)	0.01*	307	54.2 (8.4)	0.001*	358	52.9 (10.5)	<0.001*
Formal Education												
Yes	112	74.8 (11.8)	0.55	298	75.8 (14.7)	<0.001*	112	56.3 (8.5)	0.22	298	55.9 (10.1)	<0.001*
No	476	74.1 (10.8)		294	72.2 (11.0)		476	55.2 (8.5)		294	52.0 (10.2)	
Self–rated health (SRH)												
Good SRH	425	76.5 (9.5)	<0.001*	417	76.9 (11.5)	<0.001*	425	57.3 (8.0)	<0.001*	417	56.3 (9.6)	<0.001*
Poor SRH	163	68.4 (12.5)		175	67.2 (14.2)		163	50.4 (7.9)		175	48.5 (10.0)	

Table 5 (continued)

Domain	Social domain						Environmental domain					
Location	Rural			Urban			Rural			Urban		
Variable	N	Mean (SD)	p-value	N	Mean (SD)	p-value	N	Mean (SD)	p-value	N	Mean (SD)	p-value
Occupational status												
Employed	325	76.4 (10.0)	<0.001*	259	76.1 (12.5)	<0.001*	325	56.6 (8.0)	<0.001*	259	55.3 (9.8)	0.01*
Unemployed	263	71.6 (11.7)		333	72.4 (13.5)		263	53.9 (8.9)		333	53.0 (10.7)	
Home ownership												
Owner occupied	394	74.2 (10.5)	0.90	365	73.6 (12.1)	0.32	394	55.5 (8.4)	0.60	365	54.8 (10.5)	0.01*
Rented	194	74.3 (12.0)		227	74.7 (14.6)		194	55.1 (8.8)		227	52.6 (9.9)	
Home assistance												
Yes	469	74.5 (11.1)	0.31	442	74.4 (12.4)	0.24	469	55.4 (8.8)	0.69	442	53.8 (10.3)	0.49
No	119	73.3 (10.6)		150	72.9 (15.0)		119	55.1 (7.6)		150	54.5 (10.3)	

Table 6 Combined Table 2: Adjusted predictors of Quality of Life for the Social and Environmental domains by Location

Domain	Social domain						Environmental domain					
Location	Rural			Urban			Rural			Urban		
Variable	β-Coefficient	95% CI	P-value	β-Coefficient	95% CI	P-value	β-Coefficient	95% CI	P-value	β-Coefficient	95% CI	P-value
Age category												
≥70 years	−0.28	2.25–1.69	0.78	0.04	−2.17–2.25	0.97	1.04	−0.47–2.55	0.18	0.37	−1.34–2.08	0.67
<70 years	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Marital status												
Currently married	2.09	0.26–3.92	0.03*	1.09	−1.23–3.40	0.36	2.06	0.67–3.46	<0.001*	1.51	−0.27–3.31	0.10
Currently unmarried	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Formal education												
Yes	−0.33	−2.62–2.0	0.78	2.48	0.33–4.62	0.02*	0.65	−1.10–2.41	0.47	3.10	1.45–4.76	<0.001*
No	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Self-rated health												
Good	7.48	5.57–9.40	<0.001*	9.22	7.02–11.42	<0.001*	6.58	5.12–8.05	<0.001*	7.29	5.59–8.99	<0.001*
Poor	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Occupational status												
Employed	2.65	0.83–4.47	<0.001*	2.13	0.04–4.23	0.05*	1.11	−0.29–2.50	0.12	1.28	−0.34–2.90	0.12
Unemployed	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Home ownership												
Yes	−0.68	−2.47–1.11	0.46	−1.09	−3.18–1.00	0.31	−0.21	−1.58–1.16	0.77	2.27	0.65–3.89	0.01*
No	1 (ref)			1 (ref)			1 (ref)			1 (ref)		

*Significant at p<0.05

6 Conclusion

The high scores obtained in the social and physical WHO QoL domains may be because of preserving the tradition whereby older persons are cared for within the family. However, lower scores in the psychological and environmental domains may reflect the gap in the provision of targeted infrastructure and services for the care of older persons, especially housing. More so, ownership of a house was a strong predictor of good QoL among the study participants. Good self-rated health cut across all the domains in the two study settings as a predictor of good QoL.

Likewise, being employed was reflective of more positive ratings of QoL, which emphasises the need for older persons to be given opportunities for employment not solely for subsistence but to engender social relationships and the positive effects of work on health and vice versa. In terms of the environment, efforts to adapt to the environment to make it more age-friendly must also be considered, especially in rural settings. Such interventions and targeted policies must be put in place and implemented. This will add to the quality of life and not just the number of years lived by older persons, especially within the communities where they reside. There is further need for in-depth research on circumstances that contribute to good self-rated health across all the domains of quality of life among older persons. In the social and physical domains, factors that will ensure the family's sustenance as care providers for older persons need to be explored. In the psychological and environmental domains, policy and infrastructure targeted at free or subsidised housing provisions need to be explored.

Declarations

level of literacy among the study population, written consent was obtained from those who were literate while thumbprint or verbal consent was accepted for those who were unable to write.

Confidentiality of data Data collected was used for research purposes only and kept confidential on a password-protected computer. Names and addresses of the participants were not included in the data collection instrument and thus collected data cannot be linked with any person. Research assistants were also trained to keep the information confidential.

Translation of protocol to the local language The questionnaire was translated to Yoruba, the local language for ease of communication and back-translated to English to ensure the original meanings were maintained before pre-test and administration.

Beneficence to participants Findings from the conduct of this research will be used for the advancement of old age supportive policy in Oyo state, Nigeria and other low and middle-income countries.

Non-Maleficence to participants The study constituted a minimal risk to the participants due to the non-invasive nature of data collection. However, some of the questions were noted for their ability to trigger psychological response and the field assistants were trained to manage any situation that may have arisen.

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Authors and Affiliations

Eniola O. Cadmus[1,2] · Lawrence A. Adebusoye[2] · Eme T. Owoaje[1]

Lawrence A. Adebusoye
larrymacsoye27@gmail.com

Eme T. Owoaje
emetheodora@gmail.com

[1]   Department of Community Medicine, College of Medicine, University of Ibadan, Ibadan, Oyo, Nigeria

[2]   Chief Tony Anenih Geriatric Centre, University College Hospital, Ibadan, Nigeria