Double Burden of Living Alone and in Poor Socioeconomic Conditions Among Urban-dwelling Older Nigerians: A Multilevel Analysis

Jacob Wale Mobolaji

Department of Demography and Social Statistics, Obafemi Awolowo University, Ile-Ife, Nigeria

Introduction

Living alone is a major public health concern due to its association with loneliness (Nzabona et al. 2015), depression (Russell and Taylor 2009), poor psychosocial health (Millan-Calenti et al. 2013) and cardiovascular diseases in later life (Iecovich et al. 2011). Although the proportion of older people living alone in high-income regions is higher (e.g. 27% in the United States of America and 28% in Europe) compared to low- and middle-income countries (LMIC) (e.g. 9% in sub-Saharan Africa and 11% in Asia-Pacific), the associated burden is of serious concern in LMIC setting with limited resources for older people to live independently (Ausubel, 2020). Living in poor socioeconomic conditions while living alone – a phenomenon referred to as the "double burden" of living alone and in poor socioeconomic conditions (LAPSC) poses a greater threat to the well-being of older populations in LMIC. Individuals experiencing this dyad are at multiple and greater risks of the aforementioned health hazards, which potentially increase their risk of functional disability, hospitalisation and healthcare spending.

LAPSC in urban settings of LMIC presents a greater burden due to the challenges associated with urbanization, including high crime rates, environmental hazards, poverty, high living costs and socioeconomic inequalities (Akinyemi et al., 2022; Mpmoh & Opaluwah, 2018). Thus, living alone in urban settings exposes older individuals to not only the aforementioned health risks but also to self-harm, falls and domestic abuse. Urban areas in Nigeria are characterized by an increasing proportion of older adults (Iamtrakul & Chayphong, 2022), a demographic shift that mirrors the urbanization process in other countries around the world. These older individuals often find themselves navigating the complexities of urban life, where social structures and traditional family support systems are undergoing significant changes (Aboderin, 2004; Akinyemi & Akinlo, 2014). As a result, a growing number of older Nigerians are living alone, with the burdens of advancing age, economic hardship and social isolation (Kaida, Moyser, & Park, 2019).

The trend of living alone reflects the dynamics of migration, urbanization and modernism characterized by shifts in societal structures, economic changes, and individual preferences. Factors associated with this trend are multifaceted, encompassing demographic attributes such as age, gender, and marital status (Jadhav, et al., 2013; Katz, Kabeto & Langa, 2000; Sok & Yun, 2011), as well as economic considerations, cultural norms, and urbanization trends (Isherwood et al. 2012; Nzabona et al. 2015). Also, the HIV/AIDS epidemic has contributed to living alone by some older persons who have lost their children (Seeley et al. 2010; Ssengonzi 2009). Besides, childlessness (Panigrahi, 2013), marriage and labour force participation of adult daughters (Qin et al. 2008), migration, emphasis on nucleated family, modernization and the changing traditional family setting (Agree et al. 2005) have also contributed to living alone among older persons in Nigeria. Understanding these factors in the Nigerian context is essential not only for social researchers but also for policymakers, as they have far-reaching implications for social support systems.

Community characteristics are important areas to consider in studying older persons' living conditions. However, these have been under-researched in Nigeria. The choices and circumstances that lead older persons to live alone and in poor socioeconomic conditions are often intertwined with the environments in which they reside. Investigating the community-level factors influencing the living conditions of older persons serves as a lens through which community health, economic, and social dynamics can be harnessed to improve the well-being of older persons. It allows identification of communities where older individuals are at a higher risk of poor health outcomes, and provides valuable insights into how their needs can be met.

This study aims to investigate the prevalence and associated factors of LAPC among older persons in urban Nigeria. It delves into the intricate interplay of individual and community factors that contribute to the vulnerability of older

individuals living alone in impoverished conditions. By examining the prevalence and determinants of this complex issue, the study aims to provide valuable insights that can inform policy and intervention strategies tailored to the unique needs of older persons. Through rigorous analysis and empirical investigation, this study contributes to a deeper understanding of the challenges faced by older individuals living alone in urban Nigeria and, ultimately, proposes evidence-based recommendations that enhance their quality of life and well-being.

Methods

Data sources and sample design

The study utilised the household members' dataset of the 2018 Nigerian Demographic and Health Survey (DHS). The dataset elicits demographic, household, environmental and health information about the sampled households across the country. The households were selected using a stratified multi-stage cluster design. The details of the sample design and data collection methods were published in the DHS report [10]. This study was based on the individual household members, analysing a weighted total sample of 5,225 older persons aged ≥60 years for this study.

Variable measurement

In this study, the outcome variable – living alone and in poor socioeconomic conditions – was a combination of two outcome variables: living alone and socioeconomic conditions. Living alone was generated from the household living arrangement of the respondents in the dataset. Respondents living alone were coded 1 while those living with someone were coded zero. The socioeconomic condition was measured using the United Nations standard of living indicators: housing condition, drinking water, toilet facility, cooking fuel and electricity (UNDP, 2016). Household members are in poor condition in each indicator if the household has unimproved housing condition (houses with roofs or walls made of natural or rudimentary materials or has a dirt, sand or dung floor); unimproved drinking water (water sources from unprotected well and springs, and river/dam/lake/stream water or distance to drinking water is more than 15 minutes); unimproved toilet facility (use of pit latrine without slab, open pit, bush or field, bucket toilet and hanging toilet or latrine); unimproved cooking fuel (cooking done with coal or lignite, charcoal, wood, straw/shrubs/grass, and agricultural crop); and no electricity. Respondents' scores based on these indicators were summed up and the median score was obtained. Respondents whose scores were greater than or equal to the median score were categorized as living in poor socioeconomic conditions (coded 1) while others were categorized otherwise (code=0). Combining the two outcome variables, respondents who scored two had the double burden of living alone and in poor socioeconomic condition; those who scored one were either living alone or in poor condition; while those who scored zero were in a 'safe zone.'

The independent variables are the respondents' characteristics (age, sex, marital status and level of education) and community characteristics including the region of residence, community-level education and poverty. The community level of education was computed based on the proportion of household members with various levels of education in the community. The proportions were divided into tertile. The same procedure was used for computing the community poverty level.

Data analysis

This study used multilevel multinomial logistic regression to examine the individual and community factors associated with the double burden of living alone and in poor socioeconomic conditions among older Nigerians. All analyses were done using Stata version 15.1 and based on a 95% confidence level.

Ethical Considerations

The use of the NDHS dataset ensures that ethical considerations, including informed consent and data confidentiality, have already been addressed by the survey administrators. Permission was obtained from the ICF International to use the NDHS for this study.

Results

Proportions of older Nigerians living alone in poor socioeconomic conditions

The results indicate that 11.5% of urban-dwelling older Nigerians live alone, and 54.0% are in poor condition. Of those living alone, 55.4% live in poor socioeconomic conditions. Overall, 40.9% of the respondents neither live alone nor in poor condition. The proportion in LAPSC was higher among females (10.7%) compared to males (4.6%); in the oldest age group, ≥80 years (10.9%) compared to the youngest age group, 60-69 years (6.6%); among the single/divorced (22.7%) and married (15.4%) compared to widows (7.1%); in the South West (10.7%), North Central (9.8%) and South-South (9.3%) compared to other regions (≤ 5%).

Factors associated with living alone in poor socioeconomic condition

The fixed effect results provide insights into the associations between various factors (sex, age, marital status, education, community characteristics, and region of residence) and the likelihood of doubling living alone and in poor conditions. Examining the individual-level variables in Model 1, the fixed-effect results, estimated using the Relative Risk Ratios (RRR), indicate that women had an 86% higher risk of LAPC than men (RRR=1.80; p<0.001; 95% C.I.=1.33-2.42). Conversely, the risk of LAPC was lower among widows (RRR=0.12; p<0.001; 95% C.I.=0.06-0.25) compared to non-widows, the reference category. The risk was also lower among older persons with primary/secondary education (RRR=0.39; p<0.001; 95% C.I.=0.28-0.54) or tertiary education (RRR=0.10; p<0.001; 95% C.I.=0.05-0.21). These associations were consistent when adjusted for other factors in Model 2.

At the community level, older persons in the North-East, North-West and South-Eastern Nigeria also had a lower risk compared to those in the North Central (Model 1). The risk was also lower for residents of communities with moderate (RRR=0.08; p<0.001; 95% C.I.=0.03-0.26) and low poverty levels (RRR=0.01; p<0.001; 95% C.I.=0.001-0.02) compared to those in high-poverty level. When adjusted for other factors in Model 2, the associations remained consistent.

The results of the random effect, as depicted by the variance and variance partition coefficients (VPC) of the multilevel model, explain the variability in outcomes at different levels, which, in this case, is at the individual and community levels. The VPC in the empty model indicates that 72.1% of the variance in LAPSC is at the community level. The proportional change in variance (PCV) indicates that individual-level factors accounted for 42% of the variations in the risk of LAPC, while community-level factors accounted for 69%.

Table 2: Multilevel multinomial logistic regression of individual and community factors associated with living alone and in poor condition among older adults in Nigeria

	Empty model		Model 1		Model 2	
	Living alone or poor	Living alone & in poor condition	Living alone/poor	Living alone & in poor condition	Living alone or poor	Living alone & in poor condition
Level 1 (individual level)			RRR (95% C.I.)	RRR (95% C.I.)	RRR (95% C.I.)	RRR (95% C.I.)
Sex						
Male [ref]			1.00	1.00	1.00	1.00
Female			0.79 (0.66-0.94)**	1.86 (1.38-2.50)***	0.86 (0.72-1.03)	1.80 (1.33-2.42)***
Age						
<70 [ref]			1.00	1.00	1.00	1.00
70-79			0.94 (0.78-1.13)	0.99 (0.72-1.35)	0.95 (0.79-1.14)	0.95 (0.69-1.29)
80+			0.65 (0.50-0.84)**	0.94 (0.63-1.39)	0.69 (0.53-0.89)**	0.90 (0.61-1.34)
Marital status						
Non-widow [ref]			1.00	1.00	1.00	1.00
Widows			0.46 (0.25-0.83)*	0.12 (0.06-0.25)***	0.46 (0.26-0.82)**	0.13 (0.06-0.27)***
Highest level of education						
No formal education [ref]			1.00	1.00	1.00	1.00
Primary/Secondary			0.43 (0.35-0.53)***	0.38 (0.28-0.53)***	0.53 (0.43-0.65)***	0.39 (0.28-0.54)***
Tertiary			0.13 (0.09-0.17)***	0.09 (0.04-0.19)***	0.18 (0.13-0.24)***	0.10 (0.05-0.21)***
Level 2 (community level)						
Community Education						
Low [ref]			1.00	1.00	1.00	1.00
Middle			1.10 (0.61-2.00)	0.96 (0.43-2.14)	1.36 (0.76-2.44)	1.22 (0.55-2.71)
High			0.68 (0.36-1.29)	0.57 (0.24-1.38)	1.06 (0.56-2.00)	1.02 (0.42-2.47)

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Community poverty						
High ref			1.00	1.00	1.00	1.00
Middle			0.07 (0.03-0.19)***	0.08 (0.03-0.26)***	0.08 (0.03-0.20)***	0.08 (0.03-0.27)***
Low			0.01 (0.00-0.02)***	0.01 (0.00-0.02)***	0.01 (0.00-0.02)***	0.01 (0.00-0.02)***
Region						
North Central ref			1.00	1.00	1.00	1.00
North East			0.78 (0.42-1.44)	0.27 (0.11-0.68)**	0.75 (0.41-1.38)	0.30 (0.12-0.74)*
North West			0.96 (0.56-1.65)	0.18 (0.08-0.43)***	0.91 (0.53-1.55)	0.20 (0.08-0.47)***
South East			0.82 (0.51-1.33)	0.33 (0.16-0.65)**	0.85 (0.53-1.37)	0.35 (0.17-0.69)**
South South			0.89 (0.52-1.51)	0.98 (0.46-2.08)	0.94 (0.55-1.60)	1.05 (0.49-2.26)
South West			0.89 (0.57-1.39)	1.23 (0.66-2.30)	0.93 (0.59-1.44)	1.35 (0.72-2.53)
Random Effects						
Level 1						
Variance (SE)	8.57	8.49	3.33	4.93	1.45	2.48
VPC	72.3	72.1	50.3	60.0	30.6	43.0
PCV (%)	Ref	Ref	61.1	41.9	83.1	70.8
Level 2						
Variance (SE)			1.57	2.59		
VPC			32.3	44.0		
PCV (%)	Ref	Ref	81.7	69.5		

Note: SE standard error; VPC variance partition coefficient; PCV proportional change in variance; C.I. confidence interval.

Discussion

The prevalence of living alone and in poor conditions among older persons in Nigeria sheds light on a critical aspect of the country's ageing population. The findings reveal important insights into the challenges faced by older Nigerians, particularly in urban areas. The 11.5% prevalence of urban-dwelling older Nigerians living alone indicates a level of social isolation among older individuals, which has adverse effects on their mental and emotional well-being. Moreover, the finding that more than half (55.4%) of those living alone are also in poor conditions highlights a double burden of isolation and economic hardship that significantly impacts their quality of life. The demographic variations in the prevalence of LAPC are noteworthy. The higher prevalence among females, the oldest age group, and single/divorced individuals underscores the need for targeted support for these subgroups. Additionally, regional disparities suggest a regional dimension to these challenges. This indicates that interventions should be region-specific, recognizing that certain areas may have a higher concentration of older individuals living alone and in poor conditions.

The factors associated with living alone and in poor condition provide further insights. Gender emerges as a significant determinant, with women having an 86% higher risk of experiencing this double burden. This suggests the need for gender-sensitive policies and programs to support older women who are at heightened risk. Additionally, marital status and education play pivotal roles, emphasizing the importance of social support networks and education in later life.

Community characteristics, particularly poverty levels, also influence the risk of living alone and in poor socioeconomic conditions. The lower risk observed in communities with moderate and low poverty levels underscores the role of socioeconomic factors in the well-being of older individuals. This finding suggests the need for poverty reduction strategies targeted at older populations, especially in high-poverty areas.

The multilevel modelling result highlights the impact of community-level factors, with 72.1% of the variance in LAPC attributed to the community level. This underscores the importance of community-based interventions and support systems to improve the living conditions of older Nigerians.

In conclusion, these findings provide a comprehensive understanding of the prevalence and determinants of LAPSC among older persons in Nigeria. The findings call for a multi-faceted approach that addresses regional disparities, gender-specific needs, and socioeconomic factors to enhance the well-being of this vulnerable population. Policymakers and stakeholders should take these findings into account when formulating strategies to support and improve the lives of older Nigerians.