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Evaluation of the Impact of Non-Communicable Diseases on the Quality of Life and Functional Independence of the Elderly in Nigeria (A Case Study of Kaduna Metropolis)

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Abstract

Non-communicable diseases (NCDs) are of increasing concern for society and national governments, as well as globally due to their high mortality rate. While NCDs are usually associated with elderly people, all ages are at risk, even before birth. Therefore, this study aimed to evaluate the impact of NCDs on the quality of life and functional independence of the elderly in Nigeria (a case study of Kaduna metropolis). The convenience sampling method was used to recruit a total of 100 participants between the ages of 45 and 70 years. Descriptive statistics was calculated for all variables. The study shows that systolic blood pressure respondents ranked the highest risk factor with 21.1%, diastolic blood pressure ranked second with 17.9%, body mass index ranked third with 12.2% and MVPA ranked the least with 4.4%. This revealed that the major risk factor for non-communicable diseases is systolic blood pressure as noted by respondents records. The study shows that 30-second sit-to-stand test ranked the highest functional performance indicator with 25.6%, Single leg stand test-Right (sec) ranked second with 21.1%, Timed-up-and-go speed (m/sec) ranked third with 14.4%, Single leg stand test-Left (sec) ranked fourth with 13.3%, Left Handgrip strength (kg) ranked fifth with 11.1%, Right Handgrip strength (kg) ranked sixth with 10.1% and predicted peak VO_2 max ranked the least with 4.4%. This revealed that the major functional performance indicator is 30-second sit-to-stand test. In conclusion, the burden of NCDs including cardiovascular diseases continues to rise due to factors including lifestyle

and socioeconomic changes as well as rural-urban migration with its attendant stress, increasing overweight/ obesity, and dietary indiscretion i.e. Western-style fast foods. As healthcare provider, we can play major roles both in the clinic and beyond in reducing the risks posed by these factors.

Keywords: Non-communicable Diseases, Quality of Life, Functional Independence and Elderly

Introduction

Non-communicable diseases (NCDs) include cardiovascular diseases, mental illnesses, diabetes mellitus, chronic respiratory diseases, chronic kidney disease, and cancers (World Health Organisation, 2022). Non-communicable diseases (NCDs) are a major global public health concern, leading to premature mortality, decreased functional capacity, disability, poor quality of life (QoL) and increased healthcare costs (WHO, 2022). Each year, of all global deaths, 74% (41 million) occur due to NCDs, of which 17 million occur prematurely (before age 70). These deaths disproportionately affect people in low- and middle-income countries. To combat increasing mortality from NCDs, projected to reach 52 million by 2030, countries worldwide are working towards achieving Sustainable Development Goal 3.4, the aim of which is the reduction of premature mortality from NCDs by one-third by 2030 (WHO, 2022). Several strategies implemented to reduce the burden of NCD risk factors showed limited effects. According to the World Health Organisation (WHO, 2022) risk factors for NCDs decreased by 4.67%; smoking reduced by 0.6%; hypertension reduced by 0.9%; while obesity and cholesterol increased 1.66% and 0.1%, respectively from 2015 to 2019, although there have been some advances in health care internationally, the changes in the risk factors or NCDs during the four years described were less than 2% of the global population.

Underlying social determinants such as socio-economic status, sociodemographic characteristics, geographical location, and rapid urbanisation contribute to the development of NCDs in rural-urban migration (Checkley *et al.,* 2024). Within and between countries, individuals living in rural and low-resourced urban settings are exposed to various health determinants, including socio-economic status, sociodemographic characteristics, geographical locations, and rapid urbanisation. Due to the differences in rural and urban living, social determinants affect these communities differently. The difference in rural and urban lifestyles leads to the development of risk factors for NCDs, such as physical inactivity, smoking, and unhealthy diets. Such diets are characterised by high consumption of salt, sugar and fat and a lack of consumption of fruits and vegetables. Consequently, unhealthy diets can lead to the development of obesity, hypertension, dyslipidaemia, and type 2

diabetes (biological or metabolic risk factors). As a result, NCD risk factors vary depending on an individuals geographical location and lifestyle choices, making populations in rural and urban areas susceptible to different health risks (Phillips *et al.,* 2019).

Physical inactivity, a modifiable risk factor for NCDs, is associated with decreased physical fitness, which is an indicator of functional performance and refers to an individuals ability to carry out activities of daily living (ADL) safely, accurately, and independently without undue fatigue (Martorell *et al.,* 2020). Objective functional performance, such as handgrip strength, walking speed, balance and sit-to-stand, are indicators of healthy biological ageing and are related to positive health outcomes. Poor functional performance is associated with a loss of independence and a gradual decline in the ability to carry out ADL to the point of disability. Furthermore, poor functional performance and the burden of NCDs can negatively impact ones overall health-related quality of life (HRQoL). HRQoL is a multidimensional concept that focuses on the impact of NCDs on functional health and well-being as reported by the individual, or it is the individual's perception of their life related to their culture and goals. It also involves physical health, psychological status, level of independence, and social and environmental relationships (Rogge and Jacques, 2019).

Regarding functional performance and HRQoL disparities, John *et al.* (2023) did not observe differences in ADL between rural and urban Canadian adults, which is similar to findings from the South African context. Similarly, there were no variations in handgrip strength and subjective assessments of severe functional disability and QoL in a South African cohort. The growing burden of non-communicable diseases (NCDs) and an increase in the prevalence of the underlying risk factors are creating a challenge to health systems in low- and middle-income countries (LMICs). In Nigeria, deaths attributable to NCDs have been increasing, has life expectancy decreases. This poses questions with regards to how age and various risk factors interact in affecting NCDs.

Most NCDs are initiated in early life and occur as a result of an unhealthy lifestyle. Modifiable behavioral risk factors (i.e. tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity) and metabolic biological risk factors (i.e. raised blood pressure and blood glucose, abnormal lipids and overweight or obesity) contribute the most to the development of NCDs (Martorell *et al.,* 2020). The prevalence of these risk factors is boosted by an aging population, an increasing life expectancy, and by urbanization (WHO, 2022). Aging and an unhealthy lifestyle are the major driving factors for common NCDs in modern-day society. Therefore, this study will evaluate the impact of NCDs on the quality of life and functional independence of the elderly in Nigeria (a case study of Kaduna metropolis).

A significant research gap exists regarding the specific impact of Non-Communicable Diseases (NCDs) on the quality of life and functional independence of the elderly in Nigeria, particularly within the context of Kaduna Metropolis, despite the known burden of NCDs on the elderly population. While research exists on NCDs in Nigeria and their impact on quality of life and functional independence, studies specifically focusing on the elderly population within a localized area like Kaduna Metropolis are scarce. There's a need for research that

examines how NCDs affect the daily lives, social participation, and ability to perform basic tasks of the elderly in this specific urban setting. Research needs to explore the complex interplay between NCDs, socioeconomic factors, access to healthcare, social support systems, and the resulting impact on the quality of life and functional independence of the elderly. This includes understanding how factors like poverty, limited access to healthcare, and inadequate social support systems exacerbate the impact of NCDs on the elderly. The findings from such research can inform the development of targeted interventions to improve the quality of life and functional independence of the elderly with NCDs in Kaduna. This could include interventions that promote early detection and management of NCDs, improve access to healthcare, strengthen social support systems, and address socioeconomic factors that contribute to the burden of NCDs.

Research Methodology

This research adopted mixed method survey (explanatory) research design which involve both quantitative and qualitative research. The method adopted involves asking the target population for information through questionnaire, one on one discussion as well as personal observation. The quantitative part of the study deal with facts and figures aspect of the study data while the qualitative aspect of the work focus on those data that can not be measure through numeric data.

To study the impact of NCDs on the quality of life and functional independence of the elderly in Kaduna, Nigeria, inclusion criteria focus on elderly individuals (60+ years) residing in Kaduna, diagnosed with an NCD, and willing to participate, while exclusion criteria include individuals with severe cognitive impairment or those unable to provide informed consent.

The Statistical Package of Social Science (SPSS version 28) was used to analysed the data. Descriptive statistics was calculated for all variables. Visual inspection of histograms, quantile-quantile plots, and the Shapiro- Wilks test was performed to evaluate the normal distributions of the variables measured on a ratio scale. No imputations were made for missing data. Variables that conformed to a normal distribution was presented as mean and standard deviation (mean ± SD). Variables not normally distributed were reported as Median and 95% confidence intervals (95% CI). Categorical data were reported in frequencies and percentages.

Results and Discussions

As indicated in Table 1 of the study, the demographic characteristics of this study include age, marital status, educational status, number of children, income per month, and occupation. The respondents within the age bracket of 56 – 65 ranked the highest with 65.5% while respondents within the age of 45 - 55 ranked the least with 15.5%. Married respondents ranked the highest with 67.8% while separated respondents ranked the least with 3.2%. In educational status, secondary education ranked the highest with 44.4% while primary education ranked the least with 12.2%. Respondents with children ranging from 4 – 6 ranked the highest with 65.5% while respondents with children greater than 7 ranked the least with 15.5%.

Table 1: Demographic Characteristics

Options	Frequency	Percentage (%)
Age		
45-55	14	15.5
56-65	59	65.5
66 and above	17	19
Marital status		
Single	9	10
Married	61	67.8
Separated	3	3.2
Widow	17	19
Educational status		
No formal education	12	13.4
Primary	11	12.2
Secondary	40	44.4
Tertiary	27	30
Number of children		
≤3	17	19
4-6	59	65.5
>7	14	15.5
Income per month		
≤50,000	61	67.8
50,001 – 100,000	11	12.2
>100,000	18	20
Occupation		
Farming	7	7.8
Business	14	15.5
Civil service	49	54.4
Retired civil servant	21	22.3
Reported diagnosed medical condition		
Not diagnosed	26	28.9
Hypertension	35	38.9
Diabetes	21	22.3
Hypertension and diabetes	8	9.9

As shown in Table 1 of the study, civil service ranked the highest occupation of respondents with 54.4% while farming ranked the least occupation of respondents with 7.8%. This revealed that majority of respondents are average well educated and they can understand risk factors for non-communicable diseases, functional performance of the elderly on some selected non-communicable diseases and health-related quality of life of the elderly on some selected non-communicable diseases.

As indicated in Table 2 of the study, the risk factors for communicable diseases of the elderly include Body mass index (BMI), Diastolic blood pressure (DBP), High-density lipoprotein cholesterol (HDL-Chol), Low-density lipoprotein cholesterol (LDL-Chol), Moderate-vigorous physical activity (MVPA), Systolic blood pressure, Total cholesterol (T-Chol), Glucose and Triglyceride. Systolic blood pressure respondents ranked the highest risk factor with 21.1%, diastolic blood pressure ranked second with 17.9%, body mass index ranked third with 12.2% and MVPA ranked the least with 4.4%. This revealed that the major risk factor for non-communicable diseases is systolic blood pressure as noted by respondents records.

Table 2: Risk Factors for Non-Communicable Diseases of the Elderly in the Study Area

Risk Factors	Frequency	Percentage (%)
Triglyceride	5	5.6
Blood glucose	09	10
Total cholesterol (T-Chol)	10	11.1
Systolic blood pressure	19	21.1
Moderate-vigorous physical activity (MVPA)	4	4.4
Low-density lipoprotein cholesterol (LDL-Chol)	6	6.6
High-density lipoprotein cholesterol (HDL-Chol)	10	11.1
Body mass index (BMI)	11	12.2
Diastolic blood pressure (DBP)	17	17.9
Total	**90**	**100%**

Body mass index (BMI) was calculated by dividing body weight in kilogrammes by height in metres squared (kg/m^2). Participants were classified as normal weight (< 25 kg/m^2), overweight (25–29.9 kg/m^2) or obese (≥ 30 kg/m^2) and respondents used in Table 2 were in overweight and obese. Total cholesterol (T-Chol) of ≥ 5.18 mmol/L, low-density lipoprotein cholesterol (LDL-Chol) of ≥ 3.37 mmol/L, high-density lipoprotein cholesterol (HDL-Chol) of < 1.04, and blood glucose ≥ 5.5 mmol/L were classified as a risk factor and used in Table 2 of the study. Aligned with the WHO guidelines (2020), the accumulated minutes of moderate-vigorous physical activity per week (MVPA) were used to classify the respondents as inactive, insufficiently active (≤ 149 min of MVPA/week) or active (≥ 150 min of MVPA/week), insufficiently active respondents were used in Table 2 of the study.

As shown in Table 3 of the study, functional performance indicators of the elderly on some selected non-communicable diseases in the study area include Right Handgrip strength (kg), Left Handgrip strength (kg), Single leg stand test-Right (sec), Single leg stand test-Left (sec), 30-second sit-to-stand test (n), Timed-up-and-go speed (m/sec) and predicted peak VO_2 max (ml/min/kg). 30-second sit-to-stand test ranked the highest functional performance indicator with 25.6%, Single leg stand test-Right (sec) ranked second with 21.1%, Timed-up-and-go speed (m/sec) ranked third with 14.4%, Single leg stand test-Left (sec) ranked fourth with 13.3%, Left Handgrip strength (kg) ranked fifth with 11.1%, Right Handgrip strength (kg)

ranked sixth with 10.1% and predicted peak VO_2 max ranked the least with 4.4%. This revealed that the major functional performance indicator is 30-second sit-to-stand test.

Table 3: Functional Performance Indicators of the Elderly on Some Selected Non-Communicable Diseases

Indicators	Frequency	Percentage (%)
Timed-up-and-go speed (m/sec)	13	14.4
Right Handgrip strength (kg)	09	10.1
Left Handgrip strength (kg)	10	11.1
Single leg stands test-Right (sec)	19	21.1
Predicted peak VO_2 max	4	4.4
Single leg stands test-Left (sec)	12	13.3
30-second sit-to-stand test	23	25.6
Total	**90**	**100%**

As indicated in Table 4 of the study, health-related quality of life of the elderly on some selected non-communicable diseases in the study area include general health, bodily pains, physical functioning, social functioning, mental health and emotional functioning. General health ranked the highest with 25.6%, low physical functioning ranked second with 18.9%, bodily pains ranked third with 16.7%, mental health ranked fourth with 15.6% and emotional functioning ranked the least with 8.8%. This revealed that the major health related quality of life indicator in elderly is general health challenges.

Table 4: Health-Related Quality of Life of the Elderly on Some Selected Non-Communicable Diseases

Indicators	Frequency	Percentage (%)
General health	23	25.6
Bodily pains	15	16.7
Low physical functioning	17	18.9
Social functioning	13	14.4
Mental health	14	15.6
Emotional functioning	8	8.8
Total	90	100

Conclusion

In conclusion, the burden of NCDs including cardiovascular diseases continues to rise due to factors including lifestyle and socioeconomic changes as well as rural-urban migration with its attendant stress, increasing overweight/ obesity, and dietary indiscretion i.e. Western-style fast foods. As healthcare provider, we can play major roles both in the clinic and beyond in reducing the risks posed by these factors. Poor healthcare funding; endemic poverty; lack of adequate national guidelines for the prevention, control, and treatment of many NCDs; and

lack of a system to measure the quality of care given to persons with acute NCD illnesses are some of the impediments to reducing the prevalence and mortality associated with them. CVDs contribute the most to the NCD burden and deserve special attention. In addition to controlling hypertension and other cardiovascular risk factors, suffice it to say that making effective and inexpensive medications available for the treatment of identified conditions is vital in better outcome and prevention of complications.

The conclusion of the study also emphasizes the importance of establishing specialized clinics for the elderly by the government in various health centers. These medical facilities would conduct outreach activities to screen for NCDs such as hypertension, diabetes, stroke, and cardiovascular disease in elderly. It is important to remember that, in order to achieve better treatment outcomes, it is important to incorporate psychological intervention components in the management of chronic diseases among elderly individuals residing in Kaduna. This approach can effectively address the health problems faced by this population group in the study area.

This study recommended that the best prevention management strategy to reduce health-related quality of life of the elderly on some selected non-communicable diseases in the study area should include individual (lifestyle management), societal (awareness management), national (health policy decisions), and global (health strategy) elements, with target actions, such as multi-sectoral partnership, knowledge and information management, and innovations. The most effective preventative strategy should be the one that leads to changes in lifestyle with respect to diet, physical activities, cessation of smoking, and the control of metabolic disorders.

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