

Assessment of Body Composition and Physical Function of Retired Teachers in Ilorin Metropolis

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ABSTRACT: In Nigeria, retirees frequently encounter considerable emotional and financial stressors, often linked to delays or denial of their entitlements post-service, which can contribute to increased sedentary behaviour. This confluence of age-related decline, potentially low habitual physical activity, and retirement-specific challenges likely impacts the body composition and physical function of retired teachers in Oyo State. Therefore, a critical need exists to assess the health indicators among retired population.

Ex post facto research design was used in this study. A sample of 120 participants was selected based inclusion/ exclusion criteria. An adapted Senior Fitness Test (SFT) and other standardized instruments were used for data collection. Percentage, mean and standard deviation were used for data analysis.

The findings of the study revealed that;

- i. majority of the participants had normal BMI (M 24.41, SD 8.12 kg/m²) and WHR ({male, M 0.81, SD 0.07}, {female, M 0.80, SD 0.07});
- ii. majority of the participants performed below average in SFT: 8-FT Up & Go, (male: M 5.22 seconds, SD 3.03 seconds; Female: M 6.11 seconds, SD 3.46 seconds); and 2-mins steps (male, M 62.04, SD 7.23; female, M 58.33, SD 6.67).

The study concluded that; that retired teachers in Ilorin metropolis possessed low risk body composition values but exhibit poor functional capacity due to physically inactivity. It was therefore recommended that exercise intervention should be conducted among retired teachers in Ilorin metropolis for health promotion, maintenance and rehabilitation.

KEYWORDS: Body Composition, Physical Function, Physical Activity, Sedentary Behaviors

INTRODUCTION

The global population is undergoing an unprecedented demographic shift, characterised by a rapidly increasing proportion of older adults. It has been projected that by 2050, one in six people in the world will be over age 65 (Aboderin & Beard, 2015). This phenomenon, often termed population ageing, is not confined to developed nations alone. Developing countries, including Nigeria, are also experiencing a significant rise in their elderly populations (World Health Organization [WHO], 2021a). In Nigeria, while the overall population remains youthful, the absolute number of older adults is steadily increasing, presenting unique socio-economic and public health challenges (National Population Commission [NPC], 2019). As individuals transition into retirement and later life, they face an increased susceptibility to a myriad of health issues, predominantly non-communicable diseases (NCDs) such as cardiovascular diseases, type 2 diabetes, certain cancers, and musculoskeletal disorders (WHO, 2022). Central to the development and progression of many of these age-related health problems are changes in body composition and declines in physical function.

The relative proportions of fat mass and lean mass (including muscle, bone, and organs) in the body undergo significant alterations with advancing age (Cruz-Jentoft et al., 2019). A common age-related change is an increase in total body fat, particularly visceral adiposity, and a concurrent decrease in lean muscle mass, a condition known as sarcopenia (Bauer et al., 2019). Sarcopenia, characterized by the progressive and generalized loss of skeletal muscle mass and strength, is a major contributor to frailty, disability, and increased mortality in older adults (Cruz-Jentoft et al., 2019). The combination of increased adiposity and decreased muscle mass, termed sarcopenic obesity, presents an even greater health risk, synergistically impairing metabolic health and physical capability (Batsis & Villareal, 2018). These changes in body composition are not merely cosmetic; they have profound implications for metabolic processes, increasing the risk of insulin resistance, dyslipidemia, and chronic inflammation, all of which are precursors to major NCDs.

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Physical function encompasses an individual's ability to perform activities of daily living (ADLs) and instrumental activities of daily living (IADLs), maintain mobility, balance, and strength, tends to decline with age (Cesari et al., 2018). This decline can manifest as difficulty in walking, climbing stairs, rising from a chair, or performing basic self-care tasks, ultimately leading to a loss of independence and a reduced quality of life (WHO, 2021b). Physical functional limitations are strongly associated with an increased risk of falls, hospitalization, institutionalization, and mortality in older populations (Guedes et al., 2020). The determinants of physical function are multifactorial, including neurological health, sensory function, and musculoskeletal integrity. However, body composition plays a pivotal role as sarcopenia directly impacts muscle strength and power, while excess adiposity can impose an additional mechanical load on joints and further impair mobility (Scott et al., 2019). Therefore, understanding the interplay between body composition and physical function is essential for developing effective strategies to promote healthy ageing.

Retired teachers represent a specific and significant cohort within the aging population. Teaching, as a profession, can involve varying levels of physical activity depending on the subject taught and the age group of students. Some roles may be predominantly sedentary, particularly at higher education levels or in administrative capacities, while others, such as physical education or early childhood education, may involve more movement (Adeyemi & Akintunde, 2018). The transition from active employment to retirement often marks a critical juncture where lifestyle patterns, including physical activity levels and dietary habits, can change significantly (Damman et al., 2019). This period can lead to increased sedentary behavior if not actively managed, potentially accelerating adverse changes in body composition and the decline of physical function (Chastin et al., 2019). Furthermore, retired teachers, having dedicated their lives to education and public service, often possess a wealth of experience and knowledge. Their well-being is not only important for their individual quality of life but also for their potential continued contributions to society in mentorship or community roles (Ogunyemi & Olanrewaju, 2020). However, like other older adults, they are susceptible to the health challenges associated with aging, and their specific occupational background and retirement transition may present unique risk factors or protective elements that warrant investigation.

The relationship between changes in body composition and the decline in physical function is often bidirectional and complex. Increased adiposity can lead to inflammation and mechanical stress, impairing muscle function, while reduced muscle mass directly compromises strength and mobility (Scott et al., 2019). Conversely, reduced physical activity due to functional decline can exacerbate muscle loss and fat gain (Reid & Fielding, 2012, though older, the principle holds and is supported by recent work like Cadore et al., 2018). Investigating these interrelationships within the specific cohort of retired teachers in Ilorin will provide valuable insights as it could reveal whether central obesity or overall sarcopenia is more strongly associated with specific functional deficits in this group, guiding targeted interventions such as nutrition counseling focused on protein intake and resistance exercise programmes (Papa et al., 2017; Deutz et al., 2019).

The assessment of body composition in older adults often relies on anthropometric measures such as BMI, WC, and WHR due to their simplicity, non-invasiveness, and low cost, particularly in resource-limited settings (WHO, 2018). While BMI provides a general measure of weight relative to height, it does not differentiate between fat mass and lean mass, which is a critical distinction in older adults prone to sarcopenia (Batsis et al., 2021). WC and WHR offer better indicators of central adiposity, which is strongly linked to metabolic syndrome and cardiovascular risk (Ross et al., 2020). Physical function can be assessed using a battery of tests, including measures of gait speed (timed up and go test), grip strength (a proxy for overall muscle strength), balance (single-leg stance), and chair stand tests (assessing lower body strength) (Cesari et al., 2018; Cruz-Jentoft et al., 2019). These assessments provide objective data that can quantify functional capacity and identify individuals at risk of adverse outcomes.

Ilorin metropolis made up of three (3) Local Governments is the capital of Kwara State in Nigeria, is a burgeoning urban center characterized by a diverse population and evolving lifestyle patterns influenced by urbanization (Adesiji et al., 2019). Urban living can present both opportunities and challenges for healthy aging. While access to healthcare facilities and social amenities might be better than in rural areas, urban environments can also promote sedentary lifestyles due to increased reliance on motorized transport, changes in dietary patterns towards processed foods, and potentially limited safe spaces for recreational physical activity (Giles-Corti et al., 2022). For retired teachers residing in Ilorin, these urban factors, superimposed on the physiological changes of aging and the lifestyle adjustments of retirement, could significantly influence their body composition and physical function. To date, while there is a growing body of research on aging and health in Nigeria generally (Aboderin & Beard, 2015; Ogunniyi et al., 2021, for specific Nigerian health issues), there is a paucity of specific data focusing on the body composition and physical function profiles of retired teachers within distinct Nigerian urban settings like Ilorin. This gap in knowledge limits the ability to develop targeted public health interventions and support systems tailored to the needs of this specific demographic.

Understanding the status of body composition and physical function among retired teachers in Ilorin metropolis is therefore of paramount importance. Such an assessment can provide crucial baseline data, identify the prevalence of adverse conditions like obesity, sarcopenia, and functional impairment, and illuminate potential risk factors associated with their previous occupation and current retirement lifestyle. This information is vital for informing the design and implementation of targeted health promotion programmes, preventative strategies, and appropriate healthcare services aimed at improving the health span and quality of life of this valuable segment of the population (Beard et al., 2019). Furthermore, the study can contribute to a more nuanced understanding of aging population in Nigerian, potentially highlighting disparities or unique challenges that need to be addressed by policymakers

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and healthcare providers. This study therefore investigated a comprehensive assessment of body composition (using anthropometric measures such as BMI, waist circumference, hip circumference, and waist-to-hip ratio) and physical function (using standardized tests of strength, mobility, and balance) among retired teachers residing in Ilorin metropolis.

Statement of the Problem

The natural aging process entails a continuous decline in organ, system, and tissue function. Although health promotion through physical activity (PA) is recognized for its potential to extend life expectancy and reduce mortality, a significant proportion of civil servants in Kwara State appear to engage in minimal physical activity outside of their daily work routines. Retirement often magnifies health vulnerabilities, impacting individuals physiologically, psychologically, and economically. In Nigeria, retirees frequently encounter considerable emotional and financial stressors, often linked to delays or denial of their entitlements post-service, which can contribute to increased sedentary behaviour. This confluence of age-related decline, potentially low habitual physical activity, and retirement-specific challenges likely impacts the body composition and physical function of retired teachers in Oyo State. Therefore, a critical need exists to assess the health indicators among retired population.

Objectives of the Study

The objectives of the study were to:

1. ascertain the body composition variables (body mass index-BMI, waist to hip ratio-WHR) of retired teachers in Ilorin metropolis.
2. Examine the physical function (gait speed, and strength) of retired teachers in Ilorin metropolis.

Research Questions

The following research questions were answered:

1. What is the level of body composition variables (body mass index-BMI, and waist to hip ratio-WHR) of retired teachers in Ilorin metropolis?
2. What is the level of physical function (gait speed, and strength) of retired teachers in Ilorin metropolis?

METHODOLOGY

Ex post facto research design was used in this study. This research design was adopted because the researcher could not administer any treatment since the participants possessed characteristics that could not be altered. The population comprised of 4,968 retired teachers in Ilorin metropolis within the age range of 60-69 years. Systematic Sampling technique was used to select the sample of 120 for the study based on the following inclusion/ exclusion criteria. Senior Fitness Test (SFT) was adopted for data collection. Other materials used for data collection were 17 inches/ 44cm high chair, stop watch, body weighing scale, height scale, cone marker, measuring tape, non-elastic tape rule and an area clear of obstacles. Descriptive statistics of percentage, mean and standard deviation were used to analyse demographic data and answered research questions.

RESULTS:

Table 1: Descriptive analysis of Demographic Characteristics of the Participants

Age Range	Frequency	Percentage
60-64	61	50.8
65-69	59	49.2
Total	120	100
Gender	Frequency	Percentage
Male	48	40
Female	72	60
Total	120	100

Table 1 show the demographic characteristics of the participants. The age range with high frequency was 60-64 years with 61 (50.8%) participants and the low frequency was the age range of 65-69 years with 59 (49.2%) participants. There were more females 72 (60%) than males 48 (40%).

Table 2: Descriptive analysis on Body Composition (BMI & WHR) of retired teachers in Ilorin metropolis

Variable	Mean (M)	Standard Deviation (SD)
BMI	24.41	8.12
Waist-to-Hip Ratio (WHR)		
Male (n = 48)	0.81	0.07
Female (n = 72)	0.80	0.07

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BMI Category	Frequency	Percent
Underweight	12	10.0
Normal	59	49.2
Overweight	25	20.8
Obese 1	21	17.5
Obese 2	3	2.5
Total	120	100.0
WHR Category		
Low risk	89	74.2
Substantially increased risk	31	25.8
Total	120	100.0

Table 2 shows a descriptive analysis of the body composition characteristics of the participants (n = 120). The average values for each variable are: BMI, M 24.41, SD 8.12 kg/m²; and WHR, male (n = 48), M 0.81, SD 0.07, female (n = 72), M 0.80, SD 0.07. In classifying them based on disease risks, their BMI indicated that a majority of them 59 (49.2%) are normal, 59 (19.7%). In addition, the WHR category revealed a majority of them 89 (74.2%) have low risk while 31 (25.8%) have substantially increased risk.

Table 3: Descriptive analysis of Physical Function of retired teachers in Ilorin metropolis

Variable	Mean	Standard Deviation (SD)		
8-Ft Up & Go				
Male (48)	5.22	3.03		
Female (72)	6.11	3.46		
2-mins steps	62.04	7.23		
Male (48)	62.04	7.23		
Female (72)	58.33	6.67		
8-Ft Up & Go	Male	Percentage	Female	Percentage
Above average	9	18.8	17	23.6
Below average	39	81.2	55	73.4
Total	42	100.0	72	100.0
2-mins steps	Male	Percentage	Female	Percentage
Above average	19	39.6	21	29.2
Below average	29	60.4	51	70.8
Total	48	100.0	72	100.0

Table 3 shows a descriptive analysis of Physical Function of retired teachers in Ilorin metropolis (n = 120). The average values for each variables are: 8-FT Up & Go, (male: M 5.22 seconds, SD 3.03 seconds; Female (72): M 6.11 seconds, SD 3.46 seconds); and 2-mins steps, (male, M 62.04, SD 7.23; female, M 58.33, SD 6.67) which indicated that the participants performed 'below the average'. In rating the 8-FT Up & Go test of the participants; majority of the male participants 39 (81.2%) are rated to performed 'below average'; and majority of the female participants 55 (73.4%) performed 'below average'. The result of 2-mins tests showed that majority of the male participants 29 (60.4%) performed 'below average'; and 51 (70.8%) of the female participants performed 'below average'.

DISCUSSION OF FINDINGS

This study was conducted on a sample of 120 retired teachers in Ilorin metropolis aged 60 – 69 years. Majority of the participants possessed healthy body composition but there is need to engaging in physical activity based on recommendations of World Health Organization. The observation that a majority of the retired teacher participants in this study possessed a healthy body composition at the time of assessment is an encouraging finding. This could be attributed to a confluence of factors, potentially including residual benefits from a more active lifestyle during their teaching careers, a greater degree of health literacy leading to better dietary and lifestyle choices post-retirement, or socio-economic factors enabling access to nutritious food (Chao et al., 2019; Lim et al., 2018). A healthy body composition, often characterized by appropriate levels of body fat and preservation of lean mass relative to an individual's age and sex, is a significant correlate of reduced risk for numerous non-communicable diseases (NCDs) such as type 2 diabetes, cardiovascular diseases, and certain cancers.

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However, this positive baseline finding regarding body composition must be contextualized with the well-established imperative for ongoing engagement in regular physical activity (PA) throughout the lifespan, especially in older adulthood. The World Health Organization (WHO) has long emphasized the critical role of PA for health. The WHO (2020) guidelines on physical activity and sedentary behaviour reinforce and expand upon earlier recommendations, underscoring that regular PA is crucial for older adults (aged 65 years and above) irrespective of their current body composition status. These guidelines recommend at least 150-300 minutes of moderate-intensity aerobic PA, or 75-150 minutes of vigorous-intensity aerobic PA per week, or an equivalent combination, along with muscle-strengthening activities involving major muscle groups on two or more days a week. Furthermore, as part of their weekly PA, older adults should also do varied multicomponent physical activity that emphasizes functional balance and strength training at moderate or greater intensity, on 3 or more days a week, to enhance functional capacity and to prevent falls (WHO, 2020).

Findings from this study revealed that majority of the retired teachers in Ilorin metropolis possessed poor functional capacity which has direct link to sedentary lifestyles adopted. This is a significant and concerning observation. Poor functional capacity in older adults, often manifesting as reduced gait speed, diminished muscle strength (particularly lower limb strength required for tasks like rising from a chair), and impaired balance, has profound implications for their overall health, independence, and quality of life (Cesari et al., 2018; Cooper et al., 2019). It is a robust predictor of adverse outcomes such as increased risk of falls, disability, hospitalization, institutionalization, and all-cause mortality (Studenski et al., 2011, a foundational study, with its principles continually reinforced by newer research like Guedes et al., 2020). The observed prevalence of poor functional capacity in this cohort underscores a critical public health challenge within this specific demographic in Ilorin.

The strong association identified in this study between poor functional capacity and adopted sedentary lifestyles is well-supported by a substantial body of evidence. Sedentary behaviour, a behaviour characterized by an energy expenditure ≤ 1.5 metabolic equivalents (METs) while in a sitting, reclining, or lying posture (Tremblay et al., 2017), has emerged as an independent risk factor for numerous chronic diseases and premature mortality, even among individuals who meet physical activity guidelines (Ekelund et al., 2019; Biswas et al., 2019). For retired teachers, the transition from a structured, and potentially more physically demanding (depending on teaching level and subject), work life to retirement can precipitate a sharp decline in daily physical activity and an increase in sedentary time if not consciously counteracted (Smith & Mohebbi, 2021; Damman et al., 2019). This shift can be exacerbated by factors such as the loss of daily routines, reduced social engagement related to work, and perhaps in the specific context of Ilorin metropolis, limited accessible, affordable, and age-appropriate opportunities or environments for physical activity (Adesanya et al., 2020).

CONCLUSION

Based on the findings of this study, it was concluded that retired teachers in Ilorin metropolis are physically inactive; possessed healthy body composition but poor functional capacity.

RECOMMENDATION

Based on the conclusion of this study, it was recommended that exercise intervention should be conducted among retired teachers in Ilorin metropolis for health promotion, maintenance and rehabilitation.

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