HEALTHY AGING FOR ALL: THE ROLE OF PHYSICAL ACTIVITY IN BRIDGING GENDER GAP

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Abstract
This review examines the role of physical activity in promoting healthy aging, with a specific focus on addressing gender disparities in aging outcomes. Nigeria's aging population is growing rapidly. However, despite advancements in healthcare, gender gaps persist in health span, life expectancy, and quality of life among older adults, with women living longer but facing higher rates of disability and chronic conditions, and men experiencing elevated mortality risks from cardiovascular diseases. Physical activity is a critical modifiable factor that can mitigate age-related decline, yet its uptake and impact differ significantly between men and women due to physiological, social, and cultural factors. This paper synthesizes current research on how physical activity interventions can bridge these gaps, synthesizing evidence on the benefits of physical activity, exploring gender-specific barriers and tailored interventions. Drawing on epidemiological, physiological, and sociological studies, the need for equitable, gender-sensitive approaches to promote active aging for all was highlighted. Key recommendations include targeted exercise programs, community-based initiatives, and technological innovations to enhance physical activity access and adherence.

Keywords: *healthy aging, physical activity, gender disparities, Nigeria, health equity*

Introduction

Aging refers to the biological process of becoming older, typically characterized by changes in an individual's physical, cognitive, and social functioning over time. Ageing has been associated with an increased risk of non-communicable diseases, frailty and disability. To address economic, health and social care burdens related to these

adverse health conditions, maintenance of good health in later life has become a key priority for ageing research and health policy planning. Aging is characterized by several physiological, and functional changes, including, loss of muscle mass, peak oxygen uptake (VO_2max), and an increase of the incidence of pathologies, such as obesity and arthritis (Osundiya *et al.*, 2021).

Due to an increase in the world's demographics, the proportion of adults who are 65 years and older in will increase significantly in the next decade. According to Bennett *et al.* (2018), the proportion of the world's population aged 60 years or older is expected to double by 2050, reaching around 22%. This demographic shift may be driven by several factors like advances in healthcare, improvements in living standards, and declining birth rates. In Nigeria, the country's population is rapidly aging, with the number of elderly individuals aged 65 and above expected to rise from 3.1% in 2019 to 6.1% by 2050 (Mbam *et al.*, 2022). However, the imminent rise in the number aging individuals, pre-empts a proportional rise in the health challenges besetting older individuals.

According to Animasahun and Chapman (2017), the health challenges confronting the elderly in Nigeria and globally are complex and multifaceted. As individuals age, they are more susceptible to chronic conditions such as cardiovascular diseases, diabetes, malaria, HIV/AIDS, hypertension, and arthritis which account for 29% of deaths among the elderly in Nigeria, with cardiovascular diseases being the leading cause. Globally, approximately 60% of individuals aged 60 and above suffer from at least one chronic condition (Fong, 2019). Emerging evidence suggests that regular physical activity is among the most important lifestyle factors for maintenance of good health at older ages (Diri, 2025). Across developed regions of the world, inactivity ranks alongside tobacco, alcohol and obesity as a leading cause of reduced healthy life expectancy. Inactivity contributes to several specific health and function problems in old age, and has pronounced effects on strength, flexibility, aerobic capacity, walking capacity, balance and mental and cognitive decline (Hamer, Lavoie & Bacon, 2014).

Physical inactivity according to the World Health Organization (WHO, 2020) is a major underlying cause of death, non-communicable diseases and disability and can be attributed to 5 million deaths globally per year. In sub-Saharan African countries non-communicable diseases related to physical inactivity are a cause of about 3 million deaths (Oyeyemi *et al*., 2018). Insufficient physical activity is one of the leading risk factors of death worldwide and a key risk factor for non-communicable diseases such as cardiovascular diseases, diabetes, and cancer (WHO, 2018). According to the WHO, (2018), healthy ageing is defined as the process of developing and maintaining the functional ability that enables well-being in older age. The heterogeneous process of ageing includes sex based differences that accumulate over the lifespan and encompass health and lifestyle factors that impact ageing.

With global life expectancy increasing and projected to reach 77.3 years by 2030, ensuring equitable health span is a public health imperative. Gender disparities in aging outcomes are well documented: women live longer (global average: 74.7 years vs. 70.2 years for men) but experience higher rates of disability, frailty, and chronic conditions such as osteoporosis and depression. Men, conversely, face higher mortality from cardiovascular diseases (CVD) and lifestyle-related conditions. Women live longer, but report greater impairment in their functional, physical, cognitive, and social abilities as well as in their subjective well-being and physical health There is also evidence of sex differences in individual dispositions, lifestyle and health behaviours. For example, generally speaking, men are physically more active at older ages, but engage in more risky health behaviours (Maduakolam *et al*., 2023).

According to Fullagar *et al*, (2013), developing a healthy habit is critical to ageing well. Physical activity promotion has been suggested to reduce the risk of developing non-communicable diseases and the healthcare expenditure, and to increase the satisfaction with one's life and with the ageing process. Leisure-time physical activity (LTPA) is a key behaviour for active aging, with the minimum recommended amount of LTPA being 150 minutes per week. As part of healthy aging, engaging in LTPA includes decreased perceived loneliness, mortality and improved cognitive scores (Piedra *et al*., 2017; Piercy *et al*., 2018; Burrows *et al*., 2020 & Mays *et al*., 2020).

WHO (2018) defined physical activity (PA) as any bodily movement produced by skeletal muscles that requires energy expenditure, including activities undertaken while working, playing, carrying out household chores, travelling, and engaging in recreational pursuits. Common forms of physical activity include walking, dancing, swimming, running, skipping, cycling, wheeling, sports, and other active leisure-time activities. Physical activity can be carried out at any level of skill and intensity. It can be engaged at home, the workplace, recreational centres, sports centres, places of worship, or while moving from one point to another. In Nigeria, only 25% of adults aged 60+ meet WHO's PA guidelines (150–300 minutes of moderate-intensity aerobic activity weekly) with gender differences exacerbating this trend women are less likely to engage in PA due to caregiving roles, cultural norms, and economic constraints, while men face barriers related to occupational hazards and post-retirement sedentariness (WHO, 2018).

Adegboyega and Adegboyega (2015) in their study of the senior staff of tertiary institutions in Ondo found that their level of physical activity practices is significantly low. Physical inactivity may be a result of certain factors which may include fear of falls, environmental unsafety and lack of knowledge on what to do and the benefits of doing them. As the world population ages, people become more interested in maintaining their health and in physical activities or exercise (Warburton & Bredin, 2017; Kang & Bae, 2020). Moreover, a decrease in physical activity relates negatively to an increase in chronic health problems with all age groups (Centre for Disease Control and Prevention (CDC), 2020). A significant increase in sedentary or inactive time has been shown to

have a negative influence on daily functions and eventually lead to health problems, especially for older adults (CDC, 2020; Sparks *et al*., 2018; Fatoba, *et al*., 2024).

WHO (2020) advocated that regular participation in physical activities helps older adults improve their physical health, enhance muscle strength, and increase balance, while also promoting mental health and cognitive function, thereby reducing the risk of depression and anxiety. However, the proportion of older adults participating in physical activities is currently low in many countries around the world, with a preference for moderate to low-intensity activities. Moreover, a common trend is that the level of participation in physical activities gradually declines with age. This review synthesizes recent evidence to explore how PA can bridge gender gaps in healthy aging, examining physiological benefits, gender-specific barriers, tailored interventions, and policy strategies.

Physiological Benefits of Physical Activity in Aging

Physical activity mitigates age-related declines across multiple systems, counteracting declines in muscle mass, bone density, cardiovascular function, and cognitive health but its effects vary by gender due to differences in hormonal profiles, body composition, and disease susceptibility.

Musculoskeletal Health

WHO (2020) defined physical exercise as bodily movements done using the skeletal muscles that required energy expenditure. Physical exercise is one of the leading desirable health behaviour practised by many people both young and old (Keadle *et al*., 2016) and is one of the primary actions to prevent diseases that occur as a result of inactivity (de Rezende *et al*., 2014; Langhammer *et al*., 2018). Also, exercises help to relieve pain, enhance mobility, prevent cardiovascular diseases, stroke and some cancer types, reduce cognitive decline and reduce the death rate (Maduakolam *et al*., 2023).

Aging is characterized by several physiological, and functional changes, including, loss of muscle mass, peak oxygen uptake (VO_2max), and an increase of the incidence of pathologies, such as obesity and arthritis. There are numerous aspects that may contribute to muscle weakness and loss of skeletal muscle mass in elderly. These consist of; chronic illness, sedentary life style, nutritional deficiency and normal aging. Among the above factors, skeletal muscle neglect and under nutrition are preventable and in some circumstance reversible with use of interventions. (Beard *et al*., 2016; Osundiya, *et al*., 2021). Ache and pains are common among elderly people, mostly because the prevalence of diseases and conditions that cause pain, such as rheumatoid arthritis, osteoarthritis and cancer, increases with age.

Sarcopenia, the age-related loss of muscle mass and strength, affects both genders but is more prevalent in women due to lower baseline muscle mass and menopausal hormonal changes. Resistance training has been shown to increase muscle strength by 25– 100% in older adults, with women showing comparable gains to men when programs

are tailored to their needs. Similarly, weight-bearing exercises improve bone density, reducing osteoporosis risk, which is significantly higher in women. Osteoporosis is a skeletal disease characterized by low bone-mass and changes in the micro-structure of the skeleton, leading to increased frailty and a greater risk of fracture. It mostly affects post-menopausal women. (Nnamani, 2021).

Age-related loss of strength contributes to impaired mobility and increases the risk of falls. Exercise, particularly endurance, strength and balance training strengthens muscles, reduces body fat, slows down the loss of bone density and improves flexibility, which results in better capacity to walk and a decreased risks of falls and fractures. Regular physical activity prevents the risks of falls for older adults, particularly among those who engage in activities ranging from low intensity (such as walking) to more robust sports/resistance exercises. When falls occur, older adults who exercise regularly are less likely to suffer a bone fracture, as their bones are stronger and have higher bone-mineral density (McPhee *et al.*, 2016).

Falls have a significant impact on subsequent disability, quality of life, and mortality (CDC, 2014; Thiem *et al*., 2014). Women's higher fall rate may be explained by gender differences in physical activity. Compared to men, women are less physically active (in terms of aerobic exercise) and have smaller lower body strength. Osteoarthritis destroys articular cartilage, causing disability and pain. One of the problems of osteoarthritis is that the disease can only be detected by x-ray at a very late stage of development and surgery is often the only effective treatment available. The disease is more common in older people and among women and physical activity is the most effective preventive measure (CDC, 2014).

According to Maduakolam *et al*., (2023), physical exercise practices decline with age and are not common in older adults aged 65 years and above. WHO (2013) reported that about 28% of adults aged 50+ are inactive and this percentage is as high as 30% in older adults with chronic diseases. The organization further reported that around 3.2 million deaths each year are attributable to physical inactivity (WHO, 2013). Thus, it is important that elderly people indulge in physical exercise to promote health and improve and prolong life.

Cardiovascular Health

Cardiovascular disease (CVD) remains the leading cause of death in older adults, with men experiencing earlier onset and women facing higher post-menopausal risk. Aerobic exercise reduces CVD risk factors such as hypertension and dyslipidemia in both genders, but women may require lower-intensity, longer-duration activities to achieve similar benefits due to differences in cardiovascular physiology. Finally, a large meta-analysis indicated that prolonged sedentary time is associated with all-cause mortality, cardiovascular disease (CVD) incidence and mortality, type II diabetes incidence and cancer (Biswas *et al*., 2015). On a physiological level, physical activity enhances cardiovascular and muscular function, significantly reducing the risk of non-

communicable diseases (NCDs) such as cardiovascular disease, type 2 diabetes, and certain cancers.

Gender-Specific Barriers to Physical Activity

Despite PA's benefits, participation rates decline with age, with only 27% of adults 65+ meeting WHO (2018), guidelines. Gender differences exacerbate this trend, driven by social, cultural, and structural factors.

Social and Cultural Factors

Women face disproportionate barriers due to caregiving responsibilities, which consume 2–3 times more hours than men's domestic tasks. Cultural norms in many regions discourage women from public exercise, particularly in conservative societies. Cultural norms, particularly in northern Nigeria, restrict women's public exercise due to modesty concerns. Men, conversely, are often socialized to prioritize work over health, leading to sedentary lifestyles post-retirement. Occupational physical demands can also cause chronic injuries, discouraging recreational participation in physical activities (Schladitz, *et al*., 2022).

Access and Environmental Barriers

Access to safe, affordable exercise facilities is a significant barrier, particularly for women in low-income or rural areas. Safety concerns, such as fear of harassment in public spaces, reduce women's participation in outdoor physical activity by 30–40%. Men are less affected by safety but may lack access to programs addressing occupational recovery or functional fitness. Urban planning that prioritizes walkable spaces and community centres can mitigate these barriers (Ekene Okikere & Inumanye, 2024).

Psychological and Motivational Factors

Self-efficacy is a critical determinant of physical activity adherence. Women report lower confidence in strength-based activities, while men may overestimate their capabilities, increasing injury risk. Motivational strategies, such as goal-setting for men and social support for women, are essential for sustained engagement (Ekene Okikere & Inumanye, 2024). Perissinotto, Cenzer and Covinsky (2012), asserted that lonely and socially isolated older adults are at higher risk of developing chronic conditions such as heart disease, hypertension, and depression. Furthermore, social isolation has been linked to increased mortality rates among older adults. The lack of emotional support and companionship could have detrimental effects on their mental health and overall well-being.

Tailored Interventions to Bridge Gender Gaps

According to Oyeyemi *et al.* (2018), gender-sensitive interventions are critical to address disparitie, with community-based resistance training programs, modelled on global initiatives like Strong Women, capable of improving strength by 15–25% in Nigerian women. Culturally relevant programs, such as Yoruba dance, enhance engagement and aquatic exercises reduce joint pain in women with arthritis. Engaging in

sports improves cardiovascular health and social connectedness in men, with group-based resistance training increasing adherence by 30%. Mixed-gender programs like tai chi improve balance and reduce isolation Park-based exercise groups increase PA by 25%. Technology has been used to promote physical activity and change exercise behaviour. For years, pedometers, accelerometers, and heart rate monitors have been used as motivational tools. Wearable devices increase PA adherence by 15–20%. Virtual reality (VR) exercise improves balance in women. Pedometers count and monitor the number of steps taken throughout the day. Most pedometers provide a fairly accurate count of steps taken during ambulatory activities such as walking, jogging, and running. Studies report that pedometer-based walking increases physical activity (Ben *et al.*, 2019).

In a synthesis of studies addressing the use of pedometers to increase physical activity, A key predictor of increased physical activity is setting a step goal (e.g., 10,000 steps per day) for participants. Pedometer-based walking programs are associated with significant decreases in body mass index, body weight, and systolic blood pressure (Fatoba & Fatoba, 2023). Accelerometers record body acceleration minute to minute, providing detailed information about the frequency, duration, intensity, and patterns of movement. Counts from accelerometers are used to estimate energy expenditure.

Exergaming is the term given to interactive digital games in which the player actively moves. Although interactive video games, like Dance Dance Revolution (DDR), Wii Sports, Wii Fit, Sony Play Station, Xavix, and EyeToy games were designed to create a more engaging game play, studies show that these games increase energy expenditure and may produce positive health benefits. Many fitness centres, schools, and senior centres are now offering interactive games to promote physical activity of children, adolescents, and older adults. These interactive games are well suited for playing alone or with others, and they require little training or skill, provide an alternative to exercising in bad weather, and may serve as a transition to actually participating in sports and physical activities.(Iortimah & Tyoakaa, 2020) While a great majority of the exergaming focus has been on children, it also holds promise for promoting functional independence, improving balance, preventing falls, reducing premature disability, and maintaining health by increasing the physical activity levels of adults and seniors (Heyward & Gibson, 2014).

Health Issues and Diseases of the Elderly

According to Nnamani (2019), cancer is the collective name for more than 200 different diseases of varying character. The risk of contracting cancer is closely related to age and the increase in average life expectancy is in itself an important cause of the rise in the number of cases. The most common form of the disease among women is breast cancer and among men is cancer of the prostate. Other common forms are cancer of the lung and of the gastrointestinal tract. Type 2 diabetes is currently one of the most rapidly increasing diseases. This is partly related to an increasing number of people and particularly men being overweight. Diabetes sufferers are more likely to contract cardio-vascular diseases and there is an increased risk of damage to various body organs, in

particular the eyes, nervous system and kidneys, and of foot sores. Studies have shown that it is possible to dramatically reduce the onset of diabetes in glucose-intolerant individuals by changing their diets and increasing physical activity (Nnamani, 2019). This is especially important for very fat people.

Osteoarthritis destroys articular cartilage, causing disability and pain. One of the problems of osteoarthritis is that the disease can only be detected by x-ray at a very late stage of development and surgery is often the only effective treatment available. The disease is more common in older people and among women and physical activity is the most effective preventive measure. Osteoporosis is a skeletal disease characterized by low bone-mass and changes in the micro-structure of the skeleton, leading to increased frailty and a greater risk of fracture. It mostly affects post-menopausal women. The risk factors of osteoporosis which we can influence include insufficient physical activity, smoking, alcohol abuse, low calcium intake and oestrogen deficiency (McPhee *et al*., 2016).

Hearing impairment is one of the most common disabilities. Every tenth person is expected to suffer from it and eight of these ten are over the age of 60. Between 25 and 40 percent of all those over 65 are thought to have impaired hearing and this percentage increases dramatically with age. It is clearly more common among men than among women. Urinary incontinence is one of our most widespread public health diseases and can be defined as sufficient involuntary urine leakage as to cause a social and hygiene problem. The known risk factors of urinary incontinence in women include childbearing, excess weight, gynaecological surgery, defective connective tissue, long-term constipation, chronic bronchial diseases and heavy lifting. In men, the two most important, known risk factors are prostate conditions and surgical removal of the prostate. Temporary incontinence can be caused by coughing, laughing, walking, lifting or other strenuous exercise (Nnamani, 2019).

All in all, there are a number of different risk factors for incontinence, which is often associated with other serious disabilities such as dementia and stroke. Preventive measures include kegel exercises, which many women learn in connection with childbirth.

Barriers to Physical Activity Environment

Older people are more motivated to engage in physical activity when appropriate neighbourhood space, safe access to destinations and reliable services are in place. Siting physical activity programmes in inconvenient locations is associated with lower attendance by adults over 50, who are less inclined to travel longer distances for activities, but having proximity to shops, schools, cultural sites and places of social interaction encourages older adults to perform different types of PA. Use of green spaces differs by gender. Women tend to visit public parks less frequently and avoid them if they are not safe or are neglected. Men are less concerned about safety and tend to visit parks more often. Older adults, especially those with difficulties in moving independently, are more likely to take part in physical activities like walking or cycling in the

neighbourhood when places are within five minutes from home (Ekene Okikere & Inumanye, 2024).

Older adults with strong negative perceptions of the constraints in their lives and physical health problems are less likely to engage in physical activities. Those who find fatigue to be overwhelming and distressing will clearly face obstacles to participation in social activities and physical activity. Management of fatigue symptoms and avoiding combinations of medications that can cause fatigue therefore are key to preventing sedentary behaviours among older adults. Reductions in social networks affect older adults' cognitive mental health and decrease significantly their motivation to engage in physical activities. Socio-environmental factors are important in enabling older adults to participate in physical activities as reductions in social networks lessen older adults' sense of independence (Mays *et al*., 2020).

Conclusion

WHO (2021), delivering 2021-2030 as a decade of healthy ageing states that the decade is to reduce health inequities and improve the lives of older people, their families and communities through collective action. Four pillars had been set aside to achieve healthy ageing among the elderly. These are, changing how one thinks, feels and acts towards age and ageism, developing communities in ways that foster the abilities of the older people, delivery of person centred integrated care and primary health services responsive to older people. All these key pillars are to be holistically treated to bring about healthy ageing among the older population.

Evidence shows that regular physical activity is safe for healthy and for frail older people and the risks of developing major cardiovascular and metabolic diseases, obesity, falls, cognitive impairments, osteoporosis and muscular weakness are decreased by regularly completing activities ranging from low intensity walking through to more vigorous sports and resistance exercises. Yet, participation in physical activities remains low amongst older adults, particularly women.

Recommendations

Based on the conclusion, the following recommendations were made:

i. older adults should be educated and counselled on the importance of engaging in physical activity;
ii. engaging regularly in physical activity is highly recommended for the treatment and prevention of osteoporosis, falls and reducing the risk of fractures;
iii. supportive social environment should be made available for the older adults to enable them network with friends and family members in order to limit the effect of loneliness;
iv. professionals in sports and exercise science should design interventions that will increase involvement of older adults in regular physical activity as well as encourage and improve adherence and compliance to such programmes;

v. all older adults (65 and over) should engage in regular PA by doing 150–300 minutes of moderate-intensity aerobic PA, or 75–150 minutes of vigorous intensity aerobic PA, or an equivalent combination of moderate- and vigorous-intensity activity over the course of the week.

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