SELF- EFFICACY AS A PREDICTOR OF PHYSICAL ACTIVITY PATTERNS AMONG OLDER ADULTS IN SOUTH-EASTERN NIGERIA

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ABSTRACT

Background: Physical activity plays a vital role in promoting healthy aging. Exercise self-efficacy, the belief in one's ability to engage in physical activity despite challenges, is a key determinant of exercise behaviours among older adults. Understanding the interaction between these variables is essential for designing effective interventions.

Aim: To examine the relationship between self-efficacy and physical activity levels among older adults and explore the influence of sociodemographic factors such as age, gender, marital status, and educational attainment on these constructs.

Methods: A cross-sectional study was conducted among 400 community-dwelling older adults (≥65 years) selected using disproportionate stratified sampling across four quarters of Nnewi, Anambra State. Data was collected using the Exercise Self-Efficacy Scale, the Physical Activity Scale for the Elderly, and a structured sociodemographic questionnaire. Descriptive statistics of maen and standard deviation, as well as Spearman's rank order correlation, Mann–Whitney U test, and Kruskal–Wallis test were used for data analysis with level of significance set at <0.05.

Results: Most of the participants exhibited low physical activity levels and moderate exercise self-efficacy. A weak but significant positive correlation was found between exercise self-efficacy and physical activity ($r = 0.292$, $p < 0.001$). Age was negatively correlated with both physical activity ($r = -0.351$, $p < 0.001$) and self-efficacy ($r = -0.240$, $p < 0.001$). Educational level and marital status significantly influenced both outcomes, while gender differences were not statistically significant.

Conclusion: The findings highlight a significant association between self-efficacy and physical activity in older adults, emphasizing the need for interventions that enhance self-efficacy and reduce barriers to physical activity. Tailored programs that consider age, education, and marital status may improve physical activity participation among older adults in this setting.

Keywords: Self-efficacy, Physical activity, Older adults, Exercise behaviours, Sociodemographic factors

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INTRODUCTION

Individuals aged 65 and older (Older adults)[1] are characterized by the natural aging process, leading to various physical, psychological, and social challenges[2]. Aging involves loss of bone mass and a general decline in physical strength, which increases their vulnerability to illnesses and injuries[3]. The number of older adults in the United States will grow significantly, from 46.2 million today to over 98 million by 2060[3]. In contrast, Africa has the lowest number of

individuals aged 60 and older. However, the population of older adults in Africa is projected to triple between 2020 and 2050[4]. Nigeria, Africa's leading economy and most populated country, has the highest number of older people, ranking 19th globally. By 2050, the population is expected to nearly triple. Unfortunately, this increase occurs amid extreme poverty, unresolved development challenges, socioeconomic inequality, the HIV/AIDS epidemic, and a decline in traditional support for older adults. The lack of an operational national aging policy and safety net services and programmes poses a unique challenge to older Nigerians and their families.

This demographic shift highlights the need to effectively manage the hazards and costs associated with chronic illness and disability linked to aging. Fortunately, physical activity is associated with improved physical function and quality of life[3]. Despite this, current statistics reveal that the pooled crude prevalence of physical inactivity in Nigeria is 52.0%[5]. This rate was higher among women at 55.8% than among men at 49.3%. Additionally, urban dwellers have a significantly higher prevalence of physical inactivity at 56.8% than rural dwellers at 18.9%. The number of physically inactive individuals aged 20–79 years increased from 14.4 million in 1995 to 48.6 million in 2020, a 240% rise[5]. A study conducted among stroke survivors in Nnewi, Nigeria, showed that physical inactivity was one of the most prevalent risk factors[6]. According to the United States' Center for Disease Control and Prevention's Healthy Ageing Research Network Guidelines, which highlight the importance of exercise and physical activity[7], addressing age-related declines in physical function that can affect motivation to stay active is important. Consequently, understanding and enhancing self-efficacy for exercise among older adults is increasingly crucial[3]. Maintaining an active lifestyle is crucial for the overall health and well-being of older adults.

Self-efficacy, or belief in one's ability to perform specific tasks, significantly influences exercise behavior and adherence to physical activity routines[8]. Therefore, understanding how self-efficacy affects exercise participation, sedentary behavior, and overall physical activity levels in older adults is essential. Self-efficacy could play a role in breaking up sedentary periods by standing up every 30 min, even when fatigued. Higher levels of self-efficacy, both general and specific to reducing sedentary behavior, are associated with lower levels of sedentary behavior[9].

The World Health Organization recommends that older adults engage in at least 2.5 h per week of moderate-intensity activities and 1.5 h per week of vigorous-intensity activities[10]. However, many older adults struggle to meet these recommendations, highlighting the need to understand how to enhance self-efficacy to promote sustained physical activity participation in this demographic. Therefore, this study aimed to explore the relationship between self-efficacy and exercise behaviors among older adults.

MATERIALS AND METHODS

Research design

This was a cross-sectional study in which a disproportionate stratified sampling technique was adopted to recruit 400 older adults aged 65 years and above, with 100 participants selected from four quarters (Otolo, Uruagu, Umudim, and Nnewichi) of Nnewi, Anambra state.

Inclusion criteria

The inclusion criteria included: older adults ≥65 years; older adults who gave informed consent; and older adults who were oriented in time, place, and who did not present with physical impairments and were not institutionalized or bedridden.

Research instruments

The Exercise Self Efficacy Scale (ESES): was used to assess the participant's confidence in their ability to engage in and maintain regular physical exercise, especially in the face of common barriers such as fatigue, lack of time, or bad weather. It typically includes 6 to 18 items rated on a 0–100 scale, with higher scores indicating greater self-efficacy. The scale has strong psychometric properties, with high internal consistency (Cronbach's alpha = 0.76–0.94) and good validity, making it useful for predicting exercise adherence and evaluating physical activity interventions, especially among older adults and those with chronic conditions.

The Physical Activity Scale for the Elderly (PASE): was used to assess the level of physical activity in older adults, measuring occupational, household, and leisure-time physical activities over one week. It includes items on leisure, household, and occupational activities, with each activity weighted based on its intensity. Scores are calculated by multiplying activity frequency by intensity weights, producing a total score where higher values indicate greater physical activity. The PASE has demonstrated good reliability (test-retest r ≈ 0.75) and validity in older populations, making it suitable for both clinical and research use in assessing functional status and activity patterns.

Data collection

Recruitment took place in commonly frequented community locations such as homes, churches, and local markets. Ethical approval was sought and obtained from the Research Ethics Committee of the Faculty of Health Sciences and Technology, Nnamdi Azikiwe University, Nnewi Campus (Approval No: FHST/REC/024/684). Informed consent was obtained from all participants before enrolment. The purpose, procedures, and benefits of the study were clearly explained to the participants, and their participation was entirely voluntary. Assurances of anonymity, confidentiality, and the right to withdraw at any time without any consequences were provided. Additional permission was also sought from community leaders and clergy, where appropriate. Data collection was facilitated with the assistance of trained research assistants. Each eligible participant completed a structured questionnaire, which comprised sociodemographic information, the ESES, and the PASE. For participants with literacy, the questionnaires were read

aloud and responses recorded by the research assistants to ensure accurate and inclusive data capture.

Data analysis

Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to summarize participants' sociodemographic characteristics and responses to the ESES and PASE. Inferential statistics were employed to examine the relationships and group differences among key variables. The Mann–Whitney U test was used to determine gender- and marital status-based differences in physical activity and exercise self-efficacy levels. The Kruskal–Wallis test was used to assess the influence of educational attainment on these same outcomes. Spearman's rank-order correlation was used to evaluate the relationships between age, exercise self-efficacy, and physical activity levels. Statistical significance was set at $p < 0.05$.

RESULTS

Socio-demographic Profiles of the Participants

Four hundred older adults in Nnewi participated in this study. Among them, 249 (62.3%) were females and 151 (37.8%) were males. Marital status distribution of the respondents showed that 235 (58.8%) of the participants were married, whereas 165 (41.3%) were widowed. One hundred and ninety-three (48.3%) participants had primary school education as their highest level of education, making this the predominant level among the participants. Meanwhile, 42 (10.5%) had secondary education, and 6 (1.5%) attained tertiary education. However, 159 (39.8%) reported no formal education (Table 1).

Table 1. Socio-demographic Profile of Participants

Variable	Class	Frequency	Percentage
Gender	Male	151	37.8
	Female	249	62.3
Marital status	Married	235	58.8
	Widowed	165	41.3
Educational level	No education	159	39.8
	Primary level	193	48.3
	Secondary level	42	10.5
	Tertiary level	6	1.5

Physical activity level of the participants

Results obtained with the PASE analyzed showed that most participants (75.40%) had low physical activity levels, with 20.30% having moderate physical activity levels. Conversely, 3.50% reported high physical activity levels, and only 0.80% attained very high physical activity levels, demonstrating a trend of low physical activity levels among the participants (Figure 1).

Exercise self-efficacy of the participants

The ESES revealed varying levels of confidence among older adults regarding their ability to maintain physical activity in the face of common barriers. Approximately 52.5% of the participants reported moderate confidence in their ability to overcome obstacles to physical activity when they tried hard enough, while 40.5% indicated that this was rarely true for them. Only 3% expressed high confidence, stating that it was always true that they could overcome such barriers (Table 2).

When asked whether they could find ways to be physically active, 48.3% reported moderate confidence, and 41.0% said it was rarely true. Likewise, 48.5% indicated moderate confidence in accomplishing set physical activity goals, and 50.5% rarely believed they could find multiple solutions when facing exercise-related barriers.

Regarding exercising while fatigued, 50% of the participants reported low confidence, and only 1.5% believed they could always stay active despite being fatigued. A similar pattern was observed for exercising while feeling depressed, with 46.8% indicating low confidence and only 1.3% expressing high confidence.

Confidence in exercising without external support was mixed. About 46.3% of participants had moderate confidence in being active without help from family or friends, and 48.3% felt the same about exercising without a therapist or trainer. However, when it came to exercising without access to a gym or facility, 58.5% reported low confidence, highlighting perceived environmental barriers.

Additionally, 43% of the participants moderately agreed they could resume physical activity after a break, suggesting moderate resilience in reinitiating exercise habits. In general, 90.3% of the participants exhibited fair to moderate overall exercise self-efficacy, while 8.5% had low self-efficacy and only 1.3% demonstrated high self-efficacy (Figure 2).

Self-efficacy and physical activity level among the participants

The mean score of the total individual scores for the PASE was 70.175 ± 61.1613, with the maximum and minimum scores being 451.56 and 2.2, respectively. The high standard deviation highlights the high variability of respondents' performance. Likewise, the mean score reported for the total scores of the exercise self-efficacy scale was 24.22 ± 2.850, with the maximum and minimum scores being 33 and 13, respectively (Table 3).

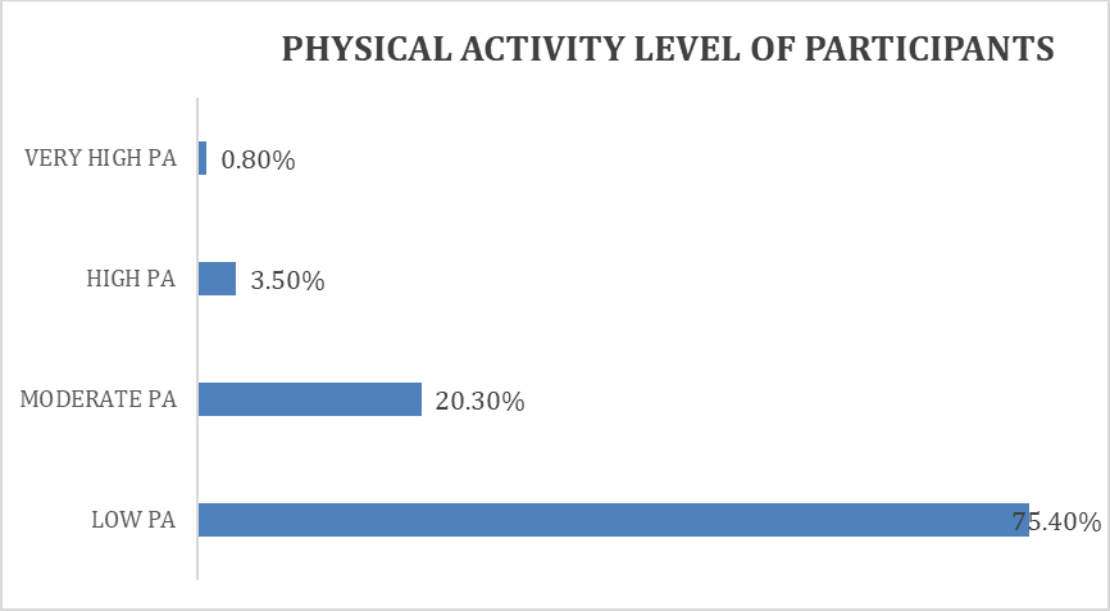

Figure 1. Physical Activity Level of Participants

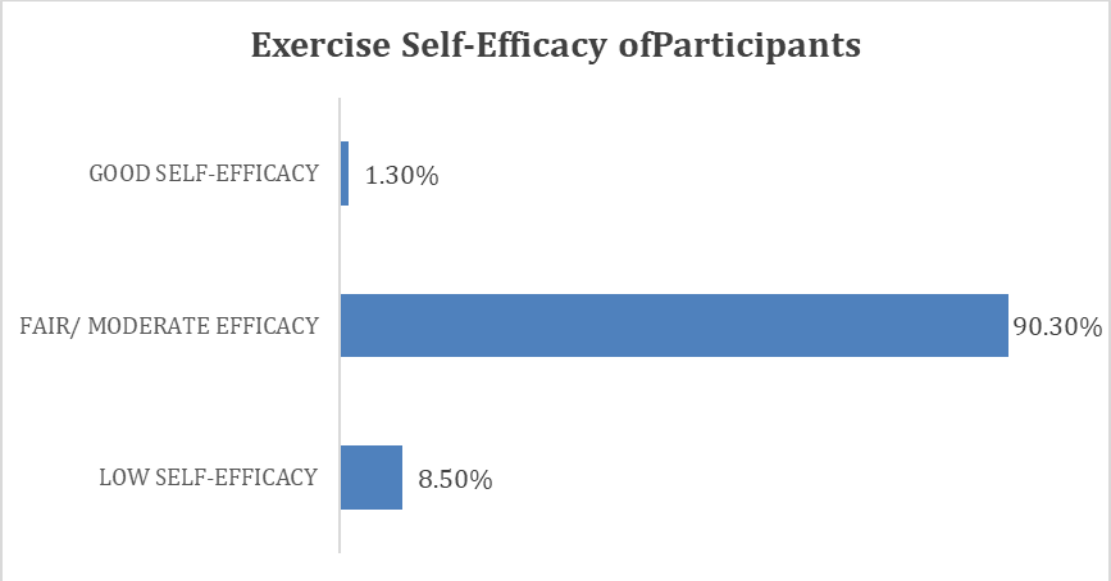

Figure 2. Exercise Self Efficacy of participants

Table 2. Participants' Response to the Exercise Self-Efficacy Scale (ESES) Instrument

Items	not always true (n)	%	rarely true (n)	%	moderately true (n)	%	Always true (n)	%
I am confident that I can overcome barriers and challenges regarding physical activity and exercise if I try hard enough	16	4.0	162	40.5	210	52.5	12	3.0
I am confident that I can find means and ways to be physically active and exercise	6	1.5	164	41.0	193	48.3	37	9.3
I am confident that I can accomplish my physical activity and exercise goals that l set	20	5.0	147	36.8	194	48.5	39	9.8
I am confident that when I am confronted with a barrier to physical activity or exercise, I can find several solutions to overcome this barrier	31	7.8	202	50.5	150	37.5	17	4.3
I am confident that I can be physically active or exercise even when I am tired	65	16.3	200	50.0	129	32.3	6	1.5
I am confident that I can be physically active or exercise even when I am feeling depressed	95	23.8	187	46.8	113	28.2	5	1.3
I am confident that I can be physically active or exercise even without the support of my family or friends	32	8.0	176	44.0	185	46.3	7	1.8
I am confident that I can be physically active or exercise without the help of a therapist or trainer	22	5.5	174	43.5	193	48.3	11	2.8
I am confident that I can motivate myself to start being physically active or exercising again after I've stopped for a while	20	5.0	185	46.3	172	43.0	23	5.8
I am confident that I can be physically active or exercise even if I have no access to a gym, exercise, training or rehabilitation facility	18	4.5	234	58.5	135	33.8	13	3.3

Table 3. Mean self-efficacy and physical activity levels among the participants

Variables	Minimum	Maximum	Mean	Standard deviation
Total Physical Activity Scale for the Elderly	2.2	451.6	70.175	61.1613
Total Exercise Self-Efficacy Scale	13	33	24.22	2.85

Correlation among age, self-efficacy, and physical activity among the participants using the Spearman's rank order test

Spearman's rank order test of correlation was conducted to examine the relationships among age, exercise self-efficacy, and physical activity level. The analysis revealed a weak but significant negative correlation between age and exercise self-efficacy ($r = -0.240$, $p < 0.001$, $n = 400$), indicating that exercise self-efficacy decreases as age increases. Similarly, a weak negative correlation was found between age and physical activity level ($r = -0.351$, $p < 0.001$, $n = 400$), suggesting that physical activity level also declines with increasing age. Conversely, a weak positive correlation was observed between exercise self-efficacy and physical activity level ($r = 0.292$, $p < 0.001$, $n = 400$), indicating that higher exercise self-efficacy is associated with increased physical activity levels (Table 4).

Table 4. Spearman Rank Order Test of Correlation Among Age, Self-Efficacy and Physical Activity Among Older Adults in Nnewi, Anambra State

	ESES Total	PASE Total
Age (years)	r = -0.240	r = -0.351
	p<0.001	P<0.001
ESES Total		r=0.292
		P<0.001

ESES, Exercise Self Efficacy Scale; PASE, Physical Activity Scale for the Elderly

Influence of gender on level of exercise self-efficacy and physical activity among the participants using the Mann–Whitney U test

The influence of gender on exercise self-efficacy and physical activity levels was analyzed using the Mann–Whitney Test. No significant difference was observed in physical activity levels between male and female participants ($p = 0.135$), although males had a higher mean rank (211.59) than females (190.07). Similarly, no significant difference was found in exercise self-efficacy between genders ($p = 0.085$), with males again showing a higher mean rank (213.20) than females (192.80) (Table 5).

Influence of the highest educational qualification on level of self-efficacy and physical activity among the participants using Kruskal–Wallis

A significant difference was observed in physical activity levels among those with no education, primary education, secondary education, and tertiary education ($p < 0.001$, $k = 80.202$). The tertiary education group had the highest mean rank (347.33), then the secondary level (289.77), primary level (223.10), and no education group (143.94). Similarly, significant differences were observed in exercise self-efficacy across the various educational levels ($p < 0.001$, $k = 70.758$). The tertiary education group had the highest mean rank (323.08), then the secondary level (272.85), primary level (226.61), and no education group (145.07) (Table 6).

Influence of marital status on level of self-efficacy and physical activity among the participants using Mann–Whitney U test

A significant difference was observed in the level of physical activity between those married and those widowed ($p = 0.001$), with those married having a higher mean rank (215.93) than those widowed (178.52). Similarly, Mann–Whitney test of the influence of marital status on level of exercise self-efficacy showed a significant difference in the level of exercise self-efficacy between those married and those widowed ($p<0.001$), with those married having a higher mean rank (222.07) than those widowed (169.78) (Table 7).

Table 5. Influence of gender on level of exercise self-efficacy and physical activity among the participants using the Mann–Whitney U test

Variable	Class	Mean Rank	U	p
PASE Total	Male	211.59	17125.500	0.135
	Female	190.07		
ESES Total	Male	213.20	16882.000	0.085
	Female	192.80		

ESES, Exercise Self Efficacy Scale; PASE, Physical Activity Scale for the Elderly

Table 6. Influence of the highest educational qualification on level of self-efficacy and physical activity among the participants using Kruskal–Wallis test

Variable	Class	Mean Rank	k	P
Total PASE	No Education	143.94	80.202	<0.001
	Primary Level	223.10		
	Secondary Level	289.77		
	Tertiary Level	347.33		
Total ESES	No Education	145.07	70.758	<0.001
	Primary Level	226.61		
	Secondary Level	272.85		
	Tertiary Level	323.08		

ESES, Exercise Self Efficacy Scale; PASE, Physical Activity Scale for the Elderly

Table 7. Influence of marital status on level of self-efficacy and physical activity among the participants using Mann–Whitney U test

Variable	Class	Mean Rank	u	P
PASE Total	Married	215.93	15761.500	0.001
	Widowed	178.52		
ESES Total	Married	222.07	14319.500	<0.001
	Widowed	169.78		

ESES, Exercise Self Efficacy Scale; PASE, Physical Activity Scale for the Elderly

DISCUSSION

Engaging in regular physical activity is a cornerstone of healthy aging, offering protective effects against several chronic diseases and functional decline. This study examined the relationship between self-efficacy and exercise habits among older adults in Nnewi, Anambra State, with a focus on how age, gender, marital status, and educational level influence these variables. The findings provide insight into the complex interactions between psychosocial factors and behavioural health among the elderly in Nigeria.

The results revealed that most participants reported low levels of physical activity, with only a small proportion engaging in high or very high levels. This trend aligns with national statistics that place Nigeria's overall physical inactivity rate at 52%, with higher prevalence in urban areas and among women[5]. The observed inactivity among the elderly may be attributed to several interrelated factors, including age-related functional decline, limited access to safe recreational spaces, socioeconomic limitations, and traditional gender roles that may restrict outdoor engagement, particularly for women[2,11].

Moreover, physical inactivity is a major risk factor for non-communicable diseases such as cardiovascular disease, diabetes, and certain cancers[12]. The World Health Organization estimates that insufficient physical activity contributes to approximately 6% of global deaths[10,13]. Therefore, the low physical activity levels observed in this study population suggest an urgent need for public health strategies that promote active aging.

Participants generally reported moderate levels of exercise self-efficacy, with only a small percentage indicating high confidence in their ability to maintain physical activity in the face of barriers such as fatigue, depression, or lack of external support. This suggests that many older adults are aware of the benefits of physical activity but lack the confidence or resources to sustain such behaviours consistently.

Several studies support the finding that self-efficacy is a critical determinant of exercise behaviours. Individuals with higher self-efficacy are more likely to initiate and maintain health-promoting behaviours, including physical activity[14]. A study similarly reported that self-efficacy not only predicts physical activity participation but is also enhanced through successful exercise experiences[15]. In this study, low self-efficacy in scenarios involving fatigue or lack of access to exercise facilities suggests that perceived internal and external barriers are major limiting factors. These findings are similar to that of a study that identified fatigue and fear of injury as prominent internal barriers[16], and another that emphasized environmental constraints such as lack of nearby facilities in rural and low-density areas[17]. Implying that interventions must be multifaceted, addressing not only motivation and beliefs but also environmental and infrastructural barriers.

A significant proportion of the participants expressed moderate confidence in exercising

independently— without therapists or family support— but confidence dropped significantly when access to gyms or facilities was removed. This points to the importance of accessible infrastructure and social support systems in fostering physical activity among older adults. A study emphasized the value of social connections in motivating older adults to remain physically active[18]. Group exercises, walking clubs, and community-based physical activity programs can not only improve adherence but also provide emotional and psychological support, reinforcing self-efficacy. Additionally, disturbances in routine or lack of suitable programs can negatively affect older adults' willingness to resume exercise, reinforcing the importance of consistency and accessibility[19]. The statistical analysis showed a weak but significant positive correlation between exercise self-efficacy and physical activity level, suggesting that greater confidence in one's ability to exercise is associated with increased activity levels. This supports findings from a study that reported that self-efficacy is positively related to physical activity, life satisfaction, and self-esteem in older men[20].

Conversely, negative correlations were observed between age and both physical activity and self-efficacy, implying that as people age, their physical activity levels and confidence in their ability to stay active decrease. This pattern is consistent with findings of studies that reported that increasing age often brings physical decline, health concerns, and reduced motivation, all of which can diminish self-efficacy and limit engagement in physical activity[18,21].

This study found no significant gender-based differences in physical activity or exercise self-efficacy levels. Although males had slightly higher mean ranks for both variables, the differences were not statistically significant. This contradicts some previous findings, which reported gender-based disparities in activity levels and confidence[8,22]. Socio-cultural contexts likely play a role in these variations. For instance, traditional roles in Nigerian communities may limit women's engagement in structured physical activity, but not necessarily their engagement in physically demanding domestic chores, possibly balancing out perceived activity levels.

Educational attainment emerged as a significant factor influencing both physical activity and self-efficacy. Participants with tertiary education had the highest mean ranks, while those with no formal education had the lowest. These results mirror findings from studies that linked higher educational levels to increased self-efficacy[23] and that academic achievement during adolescence and adulthood predicts physical activity engagement[24]. Education likely enhances awareness of health benefits and improves access to resources and environments conducive to physical activity.

Marital status also showed a significant influence. Married individuals had higher self-efficacy and physical activity levels than their widowed counterparts. This aligns with studies that reported that spouses often

serve as sources of motivation, accountability, and companionship in maintaining active lifestyles[25,26]. The absence of a partner may reduce emotional support and opportunities for shared activities, contributing to decreased exercise engagement among widowed individuals.

This study had some limitations. First, the cross-sectional design limited the ability to establish causality between variables. Second, the reliance on self-reported data from questionnaires such as the ESES and PASE may have introduced recall bias or social desirability bias, potentially affecting the accuracy of responses. Additionally, the study was conducted in a semi-urban area in Anambra State, which may limit the generalizability of findings to other regions in Nigeria, especially rural or more urbanized settings.

CONCLUSION

The results revealed that while most participants exhibited moderate levels of self-efficacy, their physical activity levels remained low. A weak but significant positive correlation between self-efficacy and physical activity was identified, indicating that individuals who are more confident in their ability to exercise are more likely to engage in physical activity. Age was negatively associated with both self-efficacy and physical activity, suggesting that advancing age may contribute to declining motivation and activity levels. Additionally, educational level and marital status significantly influenced both constructs, with higher education and being married linked to better outcomes. Although gender differences were not statistically significant, the observed trends merit further exploration.

Competing interests

The authors declare no competing interests.

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