Factors Predicting Physical Activity and Health Responsibility among Middle-Aged Staff of Tertiary Institutions in South-West, Nigeria

RESEARCH ARTICLE

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ABSTRACT

Background: Health responsibility enables an individual to achieve physical, mental, and social well-being. However, physical inactivity has become a global challenge, and that is why the World Health Organisation document for a global action plan on physical activity from 2018 to 2030, with the theme "More active people for a healthier world," is imperative. Physical activity and health responsibility are components of health-promoting behaviours that contribute to the overall health among various populations, including middle-aged staff. This study examined factors that predict physical activity and health responsibility among middle-aged staff of tertiary institutions in South-West, Nigeria.

Methods: This is a cross-sectional study. The sample comprised 415 academic and non-academic staff, aged between 40 and 65 years. The research questions were framed within the Health Promoting Lifestyle Profile 11 (HPLP-11). Mean, standard deviation, and multiple linear regressions were used for analyses.

Results: The findings of the study indicated that middle-aged staff of tertiary institutions had moderate levels of physical activity ($\bar{x}$=2.26; SD=.51) and health responsibility ($\bar{x}$=2.39; SD=.51). Furthermore, age (beta=.068, p=.001), gender (beta=-.779, p=.053), and presence of a chronic illness (beta=.684, P=.163) were associated with physical activity among middle-aged staff.

Conclusion: Middle-aged staff had moderate levels of health responsibility and physical activity. Also, gender is a predictor of health responsibility and physical activity among middle-aged staff.

Study Design	Key Instrument	Main Finding
Cross-sectional study with 415 academic and non-academic staff aged 40-65 years from three tertiary institutions.	Health Promoting Lifestyle Profile 11 (HPLP-11) focusing on physical activity and health responsibility subscales.	Moderate levels of both physical activity and health responsibility, with gender as a significant predictor.

Keywords: Physical activity, health responsibility, physical inactivity, health-promoting behaviours, healthy lifestyle

INTRODUCTION

Physical activity (PA) and health responsibility are components of health-promoting behaviours (HPBs) that contribute to the overall health among different people, including middle-aged staff (MaS). Many factors could influence or contribute to an individual's participation in PA as a health-promoting behaviour. PA is any skeletal muscle-based movement that requires the use of energy. PA also includes exercise, sports, and daily living routines that demand bodily movement (Langhammer et al., 2018). Physical inactivity has become a global challenge, which is why the World Health Organisation (WHO) document for a global action plan on physical activity (GAPP) from 2018 to 2030, with the theme "More active people for a healthier world," is imperative. The ultimate goal of the initiative is to reduce physical inactivity to 15% by 2030 (World Health Organisation, 2018). It was reported by the World Health Organisation (2024a) that approximately 1.8 billion adults worldwide did not meet the recommended levels of physical activity in 2022. The world is now falling short of the global goal to minimise physical inactivity by 2030, with levels of inactivity expected to climb to 35% by that time if the trend continues.

The World Health Organisation (2024b) estimated that $300 billion (roughly US$27 billion annually) will be spent by public health care systems worldwide between 2020 and 2030 as a result of physical inactivity if levels of physical inactivity are not decreased. It was revealed that there is a low prevalence of PA participation in developing HPBs among the adult population in Africa, particularly among staff of institutions of learning (Abaraogu et al., 2019; Dominic et al., 2018; Livingston et al., 2020), Nigeria inclusive. Nigeria has approximately 9.3 million adults with low participation in PA or/and adoption of HPBs; this might have resulted in the development of Non-Communicable Diseases (NCDs) among the adult population in Nigeria (National Population Commission [NPC], 2014). It was reported that among Nigerian adults between the ages of 50-65 years old, more than 40% did not meet the minimum PA requirement recommended by WHO (Dominic et al., 2015; Ejechi & Ogege, 2015). A nationwide systematic review and meta-analysis of 15 studies encompassing 13,800 participants revealed a combined overall prevalence of physical inactivity among Nigerian adults of 52.0% (95% CI: 33.7-70.4) (Adeloye et al., 2022). And it was stated that among Nigerians there are low physical activity and a rising prevalence of obesity (Adeoye et al., 2018).

01
Global Challenge

WHO reports 1.8 billion adults worldwide did not meet recommended physical activity levels in 2022, with Nigeria showing 52% physical inactivity prevalence.

02
Health Impact

Physical inactivity contributes to NCDs development, with estimated $300 billion health care costs globally between 2020-2030 if levels remain unchanged.

03
Research Need

Limited understanding of factors predicting physical activity and health responsibility among middle-aged tertiary institution staff in Nigeria.

Physical activity (PA) is defined as any exercise, including other activities involving bodily movement, and can be part of playful activities, active transportation, work, domestic tasks, and leisure pursuits. To meet the World Health Organisation (WHO) recommendations for PA, adults must intentionally engage in physical movement that expends energy for health promotion and the prevention of modifiable risk factors for diseases. The WHO (2024b) also defines PA as any movement initiated by the body through skeletal muscles that requires energy expenditure. They noted that 31% of adults do not meet the recommended levels of PA, and an individual's physical activity level significantly influences their health status (Bang et al., 2018).

Non-communicable diseases (NCDs), such as cardiovascular diseases, diabetes mellitus, and mental or neurological disorders, affect over 20% of adults. These conditions lead to a death rate of 70% to 80% in developed countries and 40% to 50% in developing countries (WHO, 2017). This high prevalence of NCDs can be associated with unhealthy behaviours within the adult population (Loke et al., 2021), indicating inadequate adherence to PA participation and health responsibility for promoting a healthy lifestyle.

Health responsibility is a core aspect of health-promoting behaviours (HPBs). Avci (2016) defined health responsibility as individuals fulfilling their duties to maintain their physical, mental, and social well-being. The author explained that personal health responsibility can reduce the incidence and expense of many diseases, including cancer, and boost health protection and self-management of chronic diseases. Björk et al. (2021) stated that health responsibility involves individuals committing to their health, actively working to maintain and improve it, accepting medical assistance, and avoiding blaming others for their health. They further emphasised that individuals responsible for their health are also responsible for their overall welfare. Cross-sectional studies using the Health-Promoting Lifestyle Profile II (HPLP-II) conducted among university staff and government employees revealed varying scores in the health-responsibility domain, highlighting deficiencies in regular health monitoring, utilisation of preventive care, and health information‑seeking practices (Iwuagwu & Obiagbaoso, 2024).

Individuals who prioritise their lifestyles, including physical, mental, and spiritual health, tend to live longer than those who neglect such responsibilities (Asher, 2020). Asher (2020) also concluded that health responsibility can reverse the effects of illness and restore the body to its optimal status. Hosseini et al. (2024) observed that individual health responsibility is a complex construct influenced by societal, cultural, and personal factors, which in turn impact an individual's health. Brown et al. (2019) postulated that a sub-goal of contemporary healthcare is for individuals to take responsibility for their health. Ghorabi et al. (2019) concluded that health responsibility is advantageous for all.

The period of transition from youth to old age is commonly known as middle age. Adults aged 40‑60 years are typically considered middle-aged (Bansal et al., 2015). Other jurisdictions define middle-aged persons as those aged 45‑65 years (Livingston et al., 2020).

Nevertheless, scholarly and demographic studies in Nigeria mostly define middle age as ranging from about 40-65 years (Adedeji et al., 2024; Egbi et al., 2021; Ogbera et al., 2009). Therefore, this study will adopt the age range of 40-65 years for middle-aged staff. The middle-aged phase is characterised by gradual physical, cognitive, and social changes in the individual. Furthermore, health problems such as cancer, hypertension, and diabetes may begin to manifest, especially from age 50 years and above. MAS of tertiary institutions do not participate in PA adequately despite the enormous benefits to their health, such as the prevention/management of chronic diseases, improvement of physical performance, and daily living activities (Bang et al., 2018; De Santi et al., 2020; Heath & Liguori, 2015; Langhammer et al., 2018; Ljungblad et al., 2014). Staff members in this age group at tertiary institutions claimed to face several challenges at the workplace, such as job pressure, poor salary, time constraints, lack of institutional health policy, lack of awareness, and domestic commitments at home. All these prevented them from engaging in PA, thereby affecting their health responsibility (Shehu et al., 2013; Pronk, 2013; Bhandari & Kim, 2016; Dominic et al., 2018; Shaahmadi et al., 2019).

However, there is a need to identify the variables that might influence PA participation and health responsibility for healthy lifestyles among MAS. This is essential because these factors are not clearly defined for MAS in tertiary institutions regarding their influence on PA participation and health responsibility. Likewise, to the knowledge of the researchers, there seems to be no study on factors predicting physical activity and health responsibility among middle-aged staff of tertiary institutions in Nigeria. Therefore, given the need to obtain data to identify the factors predicting physical activity and health responsibility among middle-aged staff of tertiary institutions in Ondo West, Nigeria, knowing these factors will help in understanding effective ways of addressing their impacts and formulating new policies on PA and health responsibility for MAS of tertiary institutions.

MATERIAL AND METHODS
Study Design, Setting, and Participants

A cross-sectional study was conducted between December 2021 to May 2022 at three tertiary institutions: Wesley University Ondo, Adeyemi College of Education Ondo, and University of Medical Sciences in Ondo West, Ondo State, South West Nigeria. The study population comprised academic and non-academic staff of tertiary institutions, both male and female, aged between 40 and 65 years.

Sampling and Sampling Procedures

The population comprised 1,967 middle-aged staff (MaS) of tertiary institutions, consisting of 218 from Wesley University, 1,180 from Adeyemi College of Education, and 569 from the University of Medical Sciences. The sample size for the study was determined using the sample size determination formula for a finite population (Yamane, 1967). A multistage sampling procedure was employed to draw the sample for this study. In stage one, a proportionate stratified random sampling technique was used to select the sample. The proportion of each tertiary institution within the overall population was utilised to calculate the number of participants selected from each school. The proportions for the schools were as follows: Wesley University (0.11 or 11%), Adeyemi College of Education (0.599 or 60%), and University of Medical Sciences (0.289 or 29%). Consequently, a total of 415 participants were selected: 46 from Wesley University, 249 from Adeyemi College of Education, and 120 from the University of Medical Sciences. The second stage involved the use of a simple random sampling technique (balloting without replacement) to select two faculties and two schools from Wesley University, the University of Medical Sciences, and Adeyemi College of Education, Ondo State, Nigeria. In the third stage, a simple random sampling technique (balloting without replacement) was used to select four departments from each of Wesley University, the University of Medical Sciences, and Adeyemi College of Education, Ondo State, Nigeria. This stage yielded a total of twelve departments. In the fourth stage, convenience sampling was utilised to select participants within the identified departments until the predetermined sample size was reached.

Study Setting

- Wesley University Ondo (46 participants)
- Adeyemi College of Education Ondo (249 participants)
- University of Medical Sciences (120 participants)
- Total: 415 participants aged 40-65 years

Sampling Method

Multistage sampling: proportionate stratified random sampling, then simple random sampling, followed by convenience sampling in selected departments

Data Collection Period

December 2021 to May 2022, using structured questionnaires administered at participants' offices

Data Collection Tool

After obtaining the written consent of the participants, a 57-item questionnaire was administered for data collection. This questionnaire consisted of Section A, covering socio-demographic variables, and Section B, featuring the Health Promoting Lifestyle Profile II (HPLP-II).

Section A included five socio-demographic variables: gender, age, educational level, marital status, and presence of chronic illness. Section B comprised 52 items from the HPLP-II.

Health Promoting Lifestyle Profile II (HPLP-II)

The HPLP-II is a standardised instrument developed by Walker, Sechrist, and Pender (1987). It consists of 52 items categorised into six subscales:

- Health Responsibility (9 items)
- Spiritual Growth (9 items)
- Physical Activity (8 items)
- Interpersonal Relationships (9 items)
- Nutrition (9 items)
- Stress Management (8 items)

Each item uses a four-point rating scale with responses ranging from "never" (1 point), "sometimes" (2 points), "often" (3 points), to "routinely" (4 points). The total HPLP-II score ranges from 52 to 208.

The total HPLP-II score was further divided into four lifestyle levels:

- Poor: 52-91
- Moderate: 92-131
- Good: 132-171
- Excellent: 172-208

Higher scores in each subscale indicate more frequent health-promoting behaviours. For this study, only two subscales–Health Responsibility and Physical Activity (totalling 17 items)–were utilised, as they directly addressed the research objectives.

The alpha reliability coefficient for the HPLP-II total scale was .922, and for its subscales, it ranged from .702 to .904 (Walker et al., 1987). The internal consistency (Cronbach's Alpha) for this research was .846.

Data Collection Procedure

To access the respondents, the research team met with the management staff of the three tertiary institutions at different times. Following appropriate introductions, the management staff facilitated access to the academic staff across various departments within their institutions. Informed consent was obtained from all respondents, and the research team explained the study's purposes, assuring them of data confidentiality.

Upon receiving their consent, the researchers and their assistants administered 415 copies of the questionnaire to the academic staff at their convenience in their respective offices. All administered instruments were returned, achieving a 100% return rate. However, 411 questionnaires were properly filled out and retrieved, resulting in a response rate of 99.01%. This rate was achieved through several weeks of direct visits to the academic staff in their offices. Subsequently, these 411 properly completed questionnaires were used for data analysis.

Ethical Considerations

The current study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki (World Medical Association, 2013). Approval for the study was obtained from the Faculty of Education, University of Nigeria, Nsukka, Research Ethics Committee (UNN/FE/REC21/013).

Data Analysis

Following the retrieval of the administered Health Promoting Lifestyle Profile II (HPLP-II) questionnaires, the researcher meticulously scrutinised each copy for completeness. Questionnaires with incomplete or missing information were excluded from further analysis. The data were then extracted from the properly completed questionnaires and entered into the Statistical Package for the Social Sciences (IBM SPSS Statistics for Windows, Version 23.0; IBM Corp., 2015). Data analysis proceeded on an item-by-item basis to illustrate responses based on dependent and independent variables. Descriptive statistics, including means and standard deviations, were used to analyse participants' sociodemographic characteristics and their level of health-promoting behaviours (HPBs). Multiple linear regression analysis was employed to test the null hypotheses, with a significance level set at .05.

RESULTS

Results in Table 1 indicated that the middle-aged staff of tertiary institutions in Ondo West moderately engaged in physical activity (M = 2.26; SD = .51).

Table 1: Mean and Standard Deviation of Level of Physical Activity among Middle-Aged Staff of Tertiary Institutions in Ondo West (n=411)

S/N	Items	Mean	SD
4	Follow a planned exercise programme	2.12	0.82
10	Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber)	2.30	0.86
16	Take part in light to moderate physical activity (such as sustained walking 30–40 minutes 5 or more times a week)	2.40	0.87
22	Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling)	2.22	0.84
28	Do stretching exercises at least 3 times per week	2.18	0.86
34	Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking)	2.40	0.82
40	Check my pulse rate when exercising	2.27	0.91
46	Reach my target heart rate when exercising	2.22	0.90
Cluster Mean & Total Score			
Category		**Mean**	**SD**
Cluster Mean		2.26	0.51
Total Physical Activity Score		18.04	4.10

Note. HPLP-II = Health-Promoting Lifestyle Profile Version II; *SD* = Standard Deviation. Scoring Protocol for HPLP-II (4-point rating scale): 0.00 to 1.99 = Low level; 2.00 to 2.99 = Moderate level; 3.00 to 3.49 = High level; 3.50 to 4.00 = Very high level. From *The Health-Promoting Lifestyle Profile: Development and Psychometric Characteristics*, by S. N. Walker, K. R. Sechrist, and N. J. Pender, 1987, *Nursing Research, 36*(2), pp. 76 - 81 (https://doi.org/10.1097/00006199-198703000-00008).

Results presented in Table 2 indicate that the middle-aged staff of tertiary institutions in Ondo West moderately engaged in health responsibility ($\bar{x}$ = 2.39; *SD* = 0.51).

Table 2: Mean and Standard Deviation of Health Responsibility Level among Middle-Aged Staff of Tertiary Institutions in Ondo West (n = 411)

S/N	Items	Mean	SD
3	Report any unusual signs or symptoms to a physician or other health professional	2.32	1.59
9	Read or watch TV programmes about improving health	2.37	0.84
15	Question health professionals in order to understand their instruction	2.40	0.83
21	Get a second opinion when I question my health-care provider's advice	2.30	0.82
27	Discuss my health concerns with health professionals	2.44	0.82
33	Inspect my body at least monthly for physical changes/danger signs	2.42	0.83
39	Ask for information from health professionals about how to take good care of myself	2.50	2.24
45	Attend educational programmes on personal health care	2.35	0.86
51	Seek guidance or counselling when necessary	2.52	0.89
Cluster Mean & Total Score			
Category		**Mean**	**SD**
Cluster Mean		**2.39**	**0.51**
Health Responsibility Total Score		**21.55**	**4.58**

Note. HPLP-II = Health-Promoting Lifestyle Profile Version 2; *SD* = Standard Deviation.
Scoring Protocol for HPLP-II. Score range of 1 to 4 (4-point rating scale). 0.00 to 1.99 = Low level; 2.00 to 2.99 = Moderate level; 3.00 to 3.49 = High level; 3.50 to 4.00 = Very high-level.

Table 3 presents the results of standard multiple regression analyses examining the relationship between physical activity and predictive factors. The overall model explained 3.7% of the variance in physical activity, $F_{(5, 405)}$ = 3.073, *p* = .010. Further analysis revealed that gender (β = -.779, *p* = .053) and the presence of a chronic illness (β = .684, *p* = .163) made the strongest unique contributions to explaining engagement in physical activity by middle-aged staff when controlling for other variables in the model. Age (β = .068, *p* = .001), education level (β = .185, *p* = .490), and marital status (β = .137, *p* = .444) were not statistically significant predictors and contributed less to explaining physical activity participation among the middle-aged staff.

Table 3: Summary of Standard Multiple Linear Regression Showing Predictors of Physical Activity Among Middle-Aged Staff of Tertiary Institutions in Ondo West (n=411)

Variables	B	S.E	β	t	P-value	95% CI for B (Lower)	95% CI for B (Upper)
(Constant)	20.45	1.35	—	15.51	.000	17.79	23.10
Age	−0.068	0.021	−0.172	−3.30	.001	−0.109	−0.028
Gender	−0.779	0.401	−0.095	−1.94	.053	−1.557	0.010
Educational level	0.185	0.267	0.034	0.691	.490	−0.341	0.710
Marital status	0.137	0.178	0.040	0.766	.444	−0.214	0.487
Chronic illness	0.684	0.490	0.069	1.40	.163	−0.279	1.647
R²	.037						
Adjusted R²	.025						
F	3.07						

Note. B = Unstandardised beta coefficient; β = Standardised beta coefficient; S.E = Standard error of estimate; C.I = Confidence Interval; R² = R Square; Adj.R² = Adjusted R²; F = F-ratio

Table 4 shows the results of standard multiple regression analyses of the relationship between health responsibility and predictive factors. The results showed that the entire model explained only 1.0 percent of the variance or change in the dependent variable (health responsibility), F (5,405) = 0.647, p = .664. The table further shows that though statistically significant, education level (beta = .473, p = .119) and gender (beta = −.372, p = .414) made the strongest unique contribution for explaining health responsibility of middle-aged staff when the variance/change explained by all other variables in the model is controlled for (i.e., held constant). Furthermore, presence of a chronic illness (beta = .096, p = .863), marital status (beta = .044, p = .829) and age (beta = −.011) made less of a unique contribution to explaining middle-aged staff health responsibility. Similarly, the variables were not statistically significant.

Table 4: Summary of Standard Multiple Linear Regression Showing Predictors of Health Responsibility Among Middle-Aged Staff of Tertiary Institutions in Ondo West (n=411)

Variables	B	S.E	β	t	P-value	95% CI for B (Lower)	95% CI for B (Upper)
(Constant)	20.67	1.53	—	13.51	.000	17.66	23.67
Age	−0.011	0.023	−0.025	−0.468	.640	−0.057	0.035
Gender	−0.372	0.455	−0.041	−0.818	.414	−1.27	0.522
Educational level	0.473	0.303	0.077	1.56	.119	−0.122	1.07
Marital status	0.044	0.202	0.011	0.216	.829	−0.354	0.441
Presence of chronic illness	0.096	0.555	0.010	0.173	.863	−0.996	1.19
R²	.010						
Adjusted R²	−.004						
F	0.647						

Note. B = Unstandardised beta coefficient; β = Standardised beta coefficient; S.E = Standard error of estimate; C.I = Confidence Interval; R² = R Square; Adj.R² = Adjusted R²; F = F-ratio

DISCUSSION

Research in recent years has revealed the level and benefits of health-promoting behaviours (HPBs) such as physical activity (PA) and health responsibility among adults. This study aimed to examine the factors predicting physical activity and health responsibility among middle-aged staff. Tables 1 and 2 indicate that middle-aged staff (MaS) of tertiary institutions had moderate levels of PA and health responsibility. This finding was not surprising and was expected due to heavy workloads, lack of frequent health promotion initiatives, and economic factors.

Heavy workloads, resulting from a substantial student population and an insufficient number of staff, lead to enormous tasks being shared among a few employees. For instance, tasks such as marking examination scripts within a short period and meeting deadlines for paper writing and submission processes can hinder staff from engaging in HPBs (Shehu et al., 2013; Bhandari & Kim, 2016; Dominic et al., 2018). Furthermore, the lack of consistent health promotion initiatives by school authorities, such as frequent advocacy programmes on HPBs for staff, skills development in HPBs, and the organisation of activities like physical activity, is often lacking in many Nigerian tertiary institutions, including those in Ondo West. Economic factors, such as poor salaries that do not meet current economic demands and a lack of incentives in the form of welfare packages for staff, may also affect their lifestyles (Pronk, 2013). Workers' health can be considered an outcome of individual behavioural patterns and occupational settings; therefore, management desiring to achieve organisational objectives needs to promote personal health behaviours and resource access through the implementation of specialised health programmes and services (Dominic et al., 2010).

This observation is further supported by recent data from the World Health Organisation (WHO, 2024), which indicates that physical activity levels in Sub-Saharan Africa, including Nigeria, remain significantly below recommended global averages, with notable disparities across various demographic groups. This aligns with findings from a comparative study by Oyeyemi et al. (2024), which documented declining physical activity trends among adults across eleven African countries. The heavy workload experienced by middle-aged staff, identified as a barrier to HPBs, is corroborated by studies on academic staff stress. For instance, Chukwuemeka (2023) highlighted high levels of work-related stress among Nigerian university lecturers, and a subsequent study by Chukwuemeka et al. (2025) demonstrated a clear association between such stress and reduced physical activity engagement among university staff in Nigeria.

The findings in this study corresponded with Shehu et al. (2013), who reported moderate levels of HPBs among university staff in Nigeria. Similarly, Farokhzadian et al. (2015) reported a moderate level of HPBs among the staff of Kerman University of Medical Sciences in Southeast, Iran. The findings have implications for the management of tertiary institutions to formulate policies, programmes, and healthy activities that will promote MaS health behaviours, such as PA and health responsibility, towards enhancing productivity, optimal health, and a better quality of life.

PA and health responsibility are imperative resources needed for improving health, functional abilities, cognitive stimulation, daily activities, and quality of life, especially among adults (Shrivastava et al., 2013; Eime et al., 2018; Sansano-Nadal et al., 2019). Consequently, there is a need for a specific, measurable, achievable/attainable, realistic, and time-bound physical activity (SMART PA) health promotion program. Verweij and Dawson (2019) stated that health responsibility is the obligation of every individual and should not be shifted to the government or professionals. Consequently, there is a need to initiate ways of encouraging tertiary institution staff to adopt health responsibility and improve their physical activity engagement.

Gender and the presence of chronic illness among middle-aged staff are significant predictors of physical activity (PA) engagement (Table 3). The observed influence of gender aligns with existing literature, which often indicates that men tend to engage in more physical activity than women (Eime et al., 2018; Mabweazara et al., 2021; Seong-Hui & Chulhyeong, 2020). This finding is consistent with a study by Ghorabi et al. (2021), which identified gender as a predictor of PA among employees at a medical university in Iran.

Furthermore, the presence of a chronic illness was found to predict PA levels. This outcome is expected, as healthcare professionals frequently advocate for regular physical activity as a crucial component of managing chronic conditions, often emphasising "exercise is medicine" to mitigate disease progression and maintain overall fitness. This aligns with Mabweazara et al.'s (2021) research, which reported moderate-vigorous PA engagement among individuals living with HIV, underscoring the role of exercise in chronic disease management.

Conversely, Table 3 also indicates that marital status, education level, and age were not significant predictors of PA. The lack of predictive power for education level was unexpected, given the general assumption that higher education correlates with greater awareness of PA benefits. However, this finding might be attributed to the substantial workloads experienced by middle-aged staff in tertiary institutions in Ondo West, which could limit their capacity for PA despite their knowledge (Chukwuemeka, 2023). This perspective is supported by Sattar et al. (2019), who found low PA engagement among nursing and medical students despite their educational backgrounds.

The non-significant influence of marital status was anticipated, as married individuals often balance significant family responsibilities that can impede PA participation unless intentionally **prioritised**. This observation is consistent with studies by Pettee et al. (2006) and Cavazzotto et al. (2022), which suggest that single individuals may engage in PA more frequently than their married counterparts.

Similarly, age was not found to be a significant predictor, which is unsurprising, as individuals across various age groups may be motivated to engage in PA for diverse reasons, including recreation, fitness, body shaping, or physical instruction. This finding aligns with previous research which concluded that age was not statistically significant in its association with PA. However, this result contrasts with Ghorabi et al. (2021), who identified age as a predictor of PA among medical university employees in Iran. Such discrepancies may be attributable to variations in study locations, cultural contexts, and sample characteristics between the respective studies.

While the findings in Table 4 indicated that education level and gender are predictors of health responsibility among middle-aged staff (MaS) of tertiary institutions in Ondo West, this finding may be justified by the fact that a higher educational level enhances the search for knowledge or health information on healthy living. Such information or knowledge provides a better understanding of how to take responsibility for one's health. Similar results were reported by Avci (2016), indicating that educational level affects health responsibility. The role ascribed to individuals in society, either male or female, can influence their adoption of health responsibility. Also, factors such as cultural norms around gender roles, caregiving responsibilities, and perceptions of middle age may heavily influence physical activity (PA) and health responsibility. For example, men may develop a greater sense of responsibility for their health due to vulnerability to diseases, while women may be compelled to take personal responsibility for their health and well-being due to menopausal hormonal and functional changes. These findings align with observations that gender and education level are strong predictors of health responsibility among university workers in Nigeria. Nevertheless, the finding on gender is at variance with Kamali et al. (2017), who noted that females engage more in taking responsibility for their health than men among Kurdish healthcare providers in Iraqi Kurdistan. This discrepancy in the findings may be a result of differences in the study locations of both studies.

Table 4 further indicated that the presence of a chronic illness, marital status, and age were not significant predictors of health responsibility among MaS. Sorour et al. (2014) findings on chronic illness are in agreement with the present study finding, reporting that employees in Egypt who had one of three chronic diseases such as diabetes mellitus, hypertension, or obesity had poor health responsibility. Furthermore, the finding on marital status is consistent with other research indicating that marital status had no statistically significant association with health responsibility. Similarly, the finding on age corresponds with previous research which concluded that age was not statistically significant in association with health responsibility among university workers in Nigeria. Also, Hosseini et al. (2024) reported that regarding age, there was a higher tendency among adults to engage in conversations about their personal health responsibility than other age brackets. Loke et al. (2021) reported in their study that less than a quarter of adults indicated

positive health responsibility; however, those who are working take more responsibility for their health. In their study, Hosseini et al. (2024) and Kulik et al. (2021) stated that individuals must be responsible for their health given the rise in chronic disease prevalence and high medical costs.

Workload Challenges

Heavy workload due to substantial student populations and insufficient staff numbers hinders engagement in health-promoting behaviours among tertiary institution staff.

Gender Differences

Men show higher propensity for physical activity participation, while gender roles and cultural norms influence health responsibility adoption patterns.

Educational Impact

Higher education enhances proper search for health information and understanding of how to take responsibility for one's health, despite workload constraints.

CONCLUSIONS

The study deepens understanding of PA engagement and health responsibility as HPBs among tertiary institution MaS. The findings conclude that MaS in Ondo West, Ondo State, South West Nigeria, exhibited moderate levels of PA and health responsibility. Age, gender, and chronic illness predicted PA participation, while marital status, education level, and age were not significant predictors. Educational level and age predicted health responsibility, but chronic illness and marital status were not significant predictors.

01
Institutional Policy Development

Tertiary institutions should formulate policies that encourage staff participation in healthy lifestyles and physical activity engagement.

02
Workload Management

Reduce heavy workload by employing more staff to help reduce stress levels and create time for health-promoting activities.

03
Gender-Specific Programmes

Design gender-tailored physical activity and health responsibility programmes recognising differential participation patterns.

04
Health Promotion Initiatives

Implement SMART physical activity programmes and regular health advocacy initiatives for middle-aged staff.

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AUTHOR CONTRIBUTIONS

Kerimu Ikazuwagbe Joel: Study Design, Data Collection, Literature Search, Manuscript Preparation
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CONFLICTS OF INTEREST

FUNDING

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