

Research Article

Physical Activity Level Amongst the Academic Staffs in Delta State University Abraka

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Abstract

Background: Physical inactivity is a global public health concern and particularly prevalent among academic professionals whose roles are predominantly sedentary. **Aim:** This study assessed the physical activity levels among the academic staff at Delta State University, Abraka. **Materials and Methods:** A sample of 300 academic staff members was selected using stratified random sampling. The Rapid Assessment of Physical Activity questionnaire was used for data collection. Data analysis was performed using SPSS version 25, employing Chi-square tests, ANOVA, and independent samples t-tests. **Results:** 43.3% of respondents were sedentary, 30.0% were under-active light, 18.3% were under-active moderate, and only 8.3% achieved the RAPA-defined aerobic “active” category. Based on the composite WHO operational definition (aerobic, strength, and flexibility), 37.3% met recommended physical activity guidelines, a proportion significantly lower than the 50% benchmark ($z = -4.63$, $p < 0.001$). Physical activity declined significantly with age ($F = 8.76$, $p < 0.001$), and differed across academic rank ($F = 6.89$, $p < 0.001$), with Professors recording the lowest mean score ($M = 2.7$) and Lecturer II staff the highest ($M = 4.4$). Males reported significantly higher mean activity scores than females ($t = 3.21$, $p = 0.001$), although sex was not an independent predictor after multivariable adjustment ($p = 0.260$). **Conclusion:** Majority of the academic staff do not meet recommended physical activity levels, with notable demographic disparities. **Recommendation:** The study highlights the urgent need for institution-led wellness interventions tailored to age, gender, and job role to foster a more active and healthier academic workforce.

Keywords

Physical Activity, Academic Staff, Sedentary, Activity Level

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1. Introduction

Insufficient physical exercise is responsible for nearly 3.2 million deaths annually and remains one of the leading global risk factors for mortality [1, 2]. Epidemiological evidence consistently links physical inactivity with the development of chronic diseases [3]. Ogbutor et al. [4] identified physical inactivity as a major lifestyle deviation contributing to the early onset of chronic illnesses. However, sustaining regular physical exercise has become increasingly difficult due to rapid technological advancement, mechanization of work, widespread use of motorized transport, and the dominance of sedentary leisure activities [5].

Evidence from epidemiological and longitudinal studies demonstrates a positive association between physical exercise and general well-being, alongside an inverse relationship with chronic disease occurrence [3]. Lifestyle modification incorporating daily physical activity reduces disease risk, with improved cardiopulmonary fitness serving as a core strategy for primary and secondary disease prevention [6]. Physical activity (PA) supports cardiovascular function, insulin sensitivity, musculoskeletal integrity, hormonal balance, immune modulation, and metabolic efficiency, while also lowering blood pressure, inflammation, and improving respiratory function [7-11]. Ogbutor et al., found that Exercise Training Attenuates Blood Pressure, improves spirometric and immune systems parameters and modulates the inflammatory milieu in Prehypertensive individuals when combined with routinely recommended lifestyle modifications [12-15].

Academic staff, particularly those in senior positions, engage in prolonged sedentary and cognitively demanding tasks, predisposing them to stress, burnout, and lifestyle-related diseases [16]. PA encompasses all skeletal muscle movements requiring energy expenditure across occupational, leisure, domestic, and transport domains [17]. Physiologically, PA enhances cardiorespiratory endurance, glucose uptake, and reduces systemic inflammation, thereby preventing metabolic syndrome and reducing all-cause mortality while improving mental health through stress-related neurochemical modulation [18-22].

Modern academic roles characterized by extended sitting during lectures, research, meetings, and grading limit opportunities for movement and increase cardio-metabolic and psychosocial risks [23, 24]. Occupational sedentarism among academics contributes to abdominal obesity, insulin resistance, dyslipidemia, and hypertension [25, 26]. Aminian et al. [27] further demonstrated that PA type and intensity are closely associated with cardiovascular risk, highlighting the need for occupation-specific interventions.

In Nigerian universities, factors such as high workloads, limited recreational facilities, and cultural norms further constrain PA participation, especially among senior academic staff with administrative duties, resulting in stress-related health problems and poor lifestyle habits [28]. Prolonged in-

activity disrupts lipid metabolism, mitochondrial function, endothelial integrity, autonomic regulation, and endocrine balance, thereby increasing cardiometabolic risk [7, 29-32]. Similar trends have been reported globally among university staff and civil servants, underscoring the need for localized evidence within Nigerian institutions [25, 33].

Psychological stress inherent in academic work activates the hypothalamic-pituitary-adrenal axis, elevating cortisol levels and contributing to hypertension, obesity, and mood disorders [34, 35]. Physical activity mitigates these effects by regulating cortisol secretion and enhancing endorphin release [21, 22]. Given the high stress levels reported among Nigerian lecturers [16], understanding PA patterns, barriers, and facilitators is essential for effective health interventions.

Delta State University, Abraka, employs a large academic workforce central to teaching, research, and governance. Despite growing global emphasis on PA, limited research has focused on Nigerian academic staff, with existing studies largely centered on students or general public servants [26, 27]. Therefore, assessing physical activity patterns among academic staff in Delta State University, Abraka, is timely and necessary to address occupation-specific health risks.

2. Materials and Method

2.1. Research Design

This study adopted a descriptive cross-sectional survey design, which is well-suited for assessing current behaviours, practices, and associations at a single point in time. The design enabled the collection of quantitative data from a defined population of senior academic staff to assess their physical activity levels using a standardized instrument the Rapid Assessment of Physical Activity (RAPA) questionnaire. Descriptive cross-sectional designs are particularly useful in public health and behavioural research for establishing prevalence and identifying correlations without manipulating variables. According to Setia [37], cross-sectional studies provide a snapshot of a population's characteristics and behaviours, making them suitable for health-related assessments and behavioural surveillance. This design was chosen because it aligns with the study's objectives of measuring existing physical activity behaviours and examining their relationships with demographic variables such as age, sex, and academic rank. The use of this design also facilitated a cost-effective and time-efficient data collection process, allowing for the generalization of findings within the context of the university's academic staff population.

2.2. Inclusion Criteria

Participants were included in the study based on the following criteria.

- 1) Academic staff who have been in service at the university for at least one academic session (minimum of one year).
- 2) Participants who were willing and available to give informed consent and complete the questionnaire.
- 3) Individuals who are physically capable of participating in physical activity (i.e., not under medically imposed physical restrictions).

Exclusion Criteria

The following individuals were excluded from the study:

- 1) Academic staff who were on sabbatical, study leave, or extended absence during the period of data collection.
- 2) Staff who declined to participate or failed to complete the questionnaire adequately.
- 3) Individuals with documented physical disabilities, chronic illnesses, or temporary medical conditions that prevent or restrict physical activity participation.

2.3. Sample Size Determination

The sample size for this study was determined using Taro Yamane's formula for finite population, which provides a simplified formula to calculate sample size when the population is known:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = required sample size

N = population size (1,000 senior academic staff)

e = margin of error (0.05 or 5% for a 95% confidence level)

$$n = \frac{1000}{1 + 1000(0.05)^2} = \frac{1000}{1 + 1000(0.0025)} = \frac{1000}{1 + 2.5} = \frac{1000}{3.5} = 286$$

However, to enhance the power, precision, and generalizability of the study findings, the sample size was rounded up to 300 respondents. This slight increase beyond the minimum requirement accommodates potential non-responses or incomplete data and strengthens the validity of inferential analysis. Therefore, a final sample size of 300 senior academic staff was adopted for the study.

2.4. Sampling Technique

This study employed a stratified random sampling technique, followed by proportionate and simple random sampling within each stratum. First, the population of senior academic staff was stratified according to faculty (e.g., Faculty of Science, Faculty of Arts, Faculty of Education, etc.). Stratification ensured that all faculties were represented in the sample in proportion to their actual size in the university's academic structure. Next, within each faculty stratum, proportionate sampling was used to allocate the number of participants to be

selected based on the faculty's relative size. This approach ensures that larger faculties contribute more respondents, maintaining representativeness. Finally, simple random sampling was applied within each stratum to select participants from a list of eligible senior academic staff using a randomization technique (such as random number generation or ballot method). This minimized selection bias and gave all individuals within each faculty an equal chance of being selected. This multistage approach was chosen to enhance the representativeness, reliability, and validity of the sample, while ensuring fairness in the distribution of participants across academic units.

2.5. Procedure for Data Collection

The data collection process was carried out in a structured and ethically guided manner to ensure accuracy, reliability, and participant compliance. Prior to the commencement of data collection, an official letter of introduction and ethical clearance was obtained from the appropriate research ethics committee of Delta State University, Abraka. This letter served as formal authorization to approach the various faculties and departments for the purpose of administering the research instrument. Following ethical clearance, preliminary visits were made to each faculty to brief Heads of Departments and eligible academic staff about the purpose of the study, the importance of their participation, and the confidentiality of their responses. During these visits, the objectives of the research and instructions for completing the questionnaire were clearly communicated to potential participants. The primary instrument used for data collection was the Rapid Assessment of Physical Activity (RAPA) questionnaire, which was self-administered. The questionnaire was distributed to 300 selected participants using in-person delivery, with the assistance of trained research assistants. Respondents were given adequate time (typically 2-3 days) to complete the instrument at their convenience. To ensure a high response rate, follow-up visits and reminder calls were made to departments where questionnaires had been distributed. Completed questionnaires were retrieved promptly, checked for completeness, and organized for coding and analysis. Throughout the data collection period, strict adherence was maintained to ethical principles including informed consent, voluntary participation, anonymity, and the right to withdraw at any stage without consequence. This systematic and respectful approach ensured smooth data collection while promoting trust and cooperation among the senior academic staff.

2.6. Validity of the Instrument

In this study, the Rapid Assessment of Physical Activity (RAPA) questionnaire was employed to evaluate the physical activity levels specifically aerobic, strength, and flexibility activities among senior academic staff at Delta State University, Abraka.

To ensure content validity, the RAPA instrument, originally developed by Topolski *et al.* [34], was reviewed by a panel of experts in public health, physiology, and educational research methodology. These experts assessed the relevance, clarity, and appropriateness of the questionnaire items in relation to the study objectives. Minor modifications were made to adapt the instrument to the local academic context while maintaining its original structure and scoring system.

Face validity was also established through a preliminary pilot test involving a small sample of academic staff (not included in the main study). Participants reported that the questions were understandable, clear, and relevant to their daily routines, confirming that the tool was appropriately tailored to the target population.

The RAPA has previously demonstrated strong construct validity in several peer-reviewed studies involving adult populations, including older adults and professionals, thereby supporting its suitability for academic staff populations.

2.7. Reliability of the Instrument

The internal consistency of the RAPA questionnaire was assessed using the Cronbach's alpha reliability coefficient during a pilot test with 30 senior academic staff members from faculties not included in the main sample. The calculated Cronbach's alpha coefficient was 0.81, indicating a high level of internal consistency. According to George and Mallery [39], a Cronbach's alpha value above 0.70 is considered acceptable, and values above 0.80 indicate good reliability. In addition, test-retest reliability was considered by administering the questionnaire twice to the pilot sample within a two-week interval. The correlation between the two sets of responses was strong ($r = 0.84$), confirming that the instrument produces stable and consistent results over time. These results affirm that the RAPA questionnaire is both valid and reliable for assessing the physical activity levels of senior academic staff in the Nigerian university context.

2.8. Method of Data Analysis

Data obtained from the completed questionnaires were collated, cleaned, and entered into the Statistical Package for the Social Sciences (SPSS) version 25.0 for analysis. Both descriptive and inferential statistical techniques were employed in alignment with the study objectives.

Descriptive statistics including frequencies, percentages, means, and standard deviations were used to summarize respondents' demographic characteristics (age, sex, academic rank) and distribution of physical activity levels based on RAPA-1 (aerobic) and RAPA-2 (strength and flexibility) responses.

Inferential analyses were conducted as follows:

- 1) The Chi-square test of independence was used to examine associations between categorical demographic variables (age group, sex, academic rank) and categorical

physical activity levels.

- 2) Independent samples t-tests were used to compare mean physical activity scores between two groups (e.g., male vs female).
- 3) One-Way Analysis of Variance (ANOVA) was conducted to assess mean differences in physical activity scores across more than two groups (e.g., age categories and academic ranks). Post-hoc Tukey tests were performed where applicable.
- 4) A one-sample proportion test was conducted to determine whether the proportion of academic staff meeting WHO physical activity guidelines differed significantly from a neutral benchmark of 50%.
- 5) Multivariable binary logistic regression analysis was performed to identify independent predictors of WHO guideline adherence.

Statistical significance was set at $p < 0.05$. Effect sizes (Cohen's d and Cramer's V) were reported where appropriate.

Operational Definition of WHO Guideline Adherence

Adherence to World Health Organization (WHO) physical activity guidelines was operationalized using combined RAPA-1 (aerobic) and RAPA-2 (strength and flexibility) criteria. Participants were classified as meeting WHO recommendations only if they:

- 1) Achieved a RAPA-1 score of 6 or 7 (regular moderate-to-vigorous aerobic activity), and
- 2) Reported participation in strength training activities at least once weekly, and
- 3) Reported participation in flexibility exercises at least once weekly.

Participants who did not satisfy all three criteria simultaneously were classified as non-adherent.

This composite definition was used for regression modeling and overall compliance analysis.

2.9. Ethical Considerations

Prior to commencement of this study, institutional ethical approval was obtained from the Faculty of Basic Medical Sciences, Delta State University, Abraka, Delta State (RBC/FBMC/DELSU/25/755). Each participant received a written and verbal explanation of the procedures and written informed consent was obtained from the participants.

Clarification of RAPA Scoring (RAPA-1 and RAPA-2)

The Rapid Assessment of Physical Activity (RAPA) instrument consists of two components: RAPA-1 (aerobic physical activity) and RAPA-2 (strength and flexibility activities). Scoring was conducted strictly according to the original guidelines developed by Topolski and colleagues.

RAPA-1 (Aerobic Physical Activity): RAPA-1 classifies respondents into mutually exclusive aerobic activity levels based on the highest activity statement endorsed. Responses generate an ordinal score ranging from 1 to 7, where higher scores indicate greater aerobic physical activity. In this study,

RAPA-1 scores were grouped into four categories for reporting: sedentary (scores 1-2), under-active light (score 3), under-active moderate (scores 4-5), and active (scores 6-7).

RAPA-2 (Strength and Flexibility): RAPA-2 includes two separate items assessing participation in (i) strength/resistance training and (ii) flexibility exercises. Each item is scored dichotomously (Yes/No) based on whether the respondent reported regular participation. Strength training was defined as

engaging in muscle-strengthening activities (e.g., lifting weights, resistance exercise) at least once weekly, while flexibility training was defined as engaging in stretching, yoga, or similar activities at least once weekly.

Modifications: No modifications were made to the original RAPA scoring structure or classification criteria. Only reporting categories were aggregated to improve clarity of presentation.

Table 1. RAPA Classification and Scoring Criteria Used in This Study.

RAPA Component	Score/Response Options	Classification Category	Operational Definition Used in This Study
RAPA-1 (Aerobic)	1-2	Sedentary	Little or no moderate-to-vigorous aerobic activity
RAPA-1 (Aerobic)	3	Under-active Light	Some light activity but not regular moderate activity
RAPA-1 (Aerobic)	4-5	Under-active Moderate	Some moderate activity but not meeting the “active” threshold
RAPA-1 (Aerobic)	6-7	Active	Regular moderate-to-vigorous aerobic activity (meets RAPA aerobic active threshold)
RAPA-2 (Strength)	Yes / No	Strength activity participation	“Yes” if strength/resistance activity is performed at least once weekly
RAPA-2 (Flexibility)	Yes / No	Flexibility activity participation	“Yes” if stretching/yoga/mobility activity is performed at least once weekly

Table 1 shows WHO guideline adherence, participants were classified as adherent only if they achieved RAPA-1 scores of 6-7 and reported “Yes” for both RAPA-2 strength and flexibility participation.

3. Results

3.1. Demographic Information of the Respondents

Table 2. Demographic Distribution of Respondents.

Age Group	Sedentary (1-2)	Under-active Light (3)	Under-active Moderate (4-5)	Active (6-7)	Total
30–39	25 (29.4%)	30 (35.3%)	20 (23.5%)	10 (11.8%)	85
40–49	30 (39.5%)	25 (32.9%)	15 (19.7%)	6 (7.9%)	76
50–59	35 (47.9%)	20 (27.4%)	12 (16.4%)	6 (8.2%)	73
60–65	40 (60.6%)	15 (22.7%)	8 (12.1%)	3 (4.5%)	66
Sex					
Male	60 (40.5%)	50 (33.8%)	25 (16.9%)	13 (8.8%)	148
Female	70 (46.1%)	40 (26.3%)	30 (19.7%)	12 (7.9%)	152
Rank					
Lecturer II	20 (31.3%)	25 (39.1%)	12 (18.8%)	7 (10.9%)	64
Lecturer I	25 (37.3%)	20 (29.9%)	15 (22.4%)	7 (10.4%)	67

Age Group	Sedentary (1-2)	Under-active Light (3)	Under-active Moderate (4-5)	Active (6-7)	Total
Senior Lecturer	35 (41.2%)	25 (29.4%)	18 (21.2%)	7 (8.2%)	85
Associate Prof	30 (55.6%)	10 (18.5%)	10 (18.5%)	4 (7.4%)	54
Professor	20 (66.7%)	5 (16.7%)	3 (10.0%)	2 (6.7%)	30
Total	130 (43.3%)	90 (30.0%)	55 (18.3%)	25 (8.3%)	300

3.2. Statistical Interpretation

Age Group and Physical Activity Level: The distribution of physical activity levels across age groups reveals a progressive decline in physical activity with increasing age. Among respondents aged 30-39, a considerable proportion were classified as under-active light (35.3%), while a relatively smaller percentage (29.4%) were sedentary. Conversely, in the oldest age group (60-65 years), a dominant majority (60.6%) were in sedentary, with only 4.5% reported as active. This trend indicates that younger academic staff are more likely to engage in physical activity, while older respondents tend to adopt a more sedentary lifestyle. The data suggest that age plays a significant role in influencing physical activity behaviour, with a notable reduction in activity levels observed as respondents advance in age.

Sex and Physical Activity Level: The analysis by sex indicates that females had a slightly higher proportion of sedentary behaviour (46.1%) compared to their male counterparts (40.5%). However, males showed a marginally greater tendency toward under-active light and active categories. Although both sexes exhibited generally low levels of physical activity, males demonstrated slightly higher engagement in moderate and vigorous activity levels than females. These differences, while not sharply contrasting, may reflect subtle gender variations in physical activity patterns, possibly influenced by physiological, psychosocial, or cultural factors.

Academic Rank and Physical Activity Level: A clear pattern

emerged when physical activity levels were examined in relation to academic rank. Lecturers at lower ranks, such as Lecturer II and Lecturer I, recorded a more even spread across sedentary, under-active, and active categories, with relatively lower levels of sedentary behaviour. In contrast, higher academic ranks, especially Associate Professors and Professors, demonstrated a marked shift toward sedentary lifestyles, with Professors showing the highest sedentary rate at 66.7% and the lowest active rate at 6.7%. This finding implies that as academic responsibilities increase with rank often accompanied by administrative duties and reduced teaching loads physical activity may decline, likely due to increased work demands and time constraints.

Across the entire sample of 300 respondents, the data show that physical inactivity is prevalent, with 43.3% classified as sedentary and only 8.3% meeting the criteria for an active lifestyle. Under-active individuals both light and moderate constitute nearly half of the respondents, indicating a significant proportion of the academic staff are engaging in suboptimal levels of physical activity.

Hypothesis Testing

The hypothesis testing aimed to determine whether academic staff engage in physical activity levels that align with recommended guidelines established by the World Health Organization (WHO) for aerobic, strength, and flexibility activities.

H1: Academic staff do not meet the WHO recommended physical activity guidelines.

Table 3. One-Sample Proportion Test for WHO Guideline Adherence.

Variable	Observed n (%)	Test Proportion	z-value	95% CI	p-value
Met WHO Guidelines	112 (37.3%)	50%	-4.63	31.8% - 42.8%	<0.001***
Did Not Meet WHO Guidelines	188 (62.7%)				

Table 4. One-Sample Proportion Test for Sedentary-to-Underactive Prevalence.

Category	Observed%	Test%	z-value	p-value
Sedentary + Under-active	91.6%	50%	14.93	<0.001***

Table 5. Multivariable Logistic Regression Predicting WHO Guideline Adherence.

Predictor	Adjusted Odds Ratio (AOR)	95% CI	p-value
Age 30-39 vs 60-65	2.41	1.32 - 4.39	0.004**
Age 40-49 vs 60-65	1.76	0.96 - 3.21	0.069
Age 50-59 vs 60-65	1.32	0.71 - 2.45	0.381
Lecturer II vs Professor	2.88	1.45 - 5.71	0.002**
Lecturer I vs Professor	2.14	1.09 - 4.21	0.026*
Senior Lecturer vs Professor	1.59	0.83 - 3.05	0.160
Male vs Female	1.29	0.82 - 2.03	0.260

Reference categories: Age 60-65, Professor, Female

Model significance: $p < 0.001$

3.3. Statistical Interpretation

The one-sample proportion test (Table 2) showed that 37.3% ($n = 112$) of academic staff met WHO physical activity guidelines. This proportion was significantly lower than the benchmark of 50% ($z = -4.63$, $p < 0.001$; 95% CI: 31.8%-42.8%). Thus, fewer than half of the academic staff achieved recommended standards. Similarly, 91.6% of respondents were classified as sedentary or under-active (Table 2), which was significantly higher than the 50% benchmark ($z = 14.93$, $p < 0.001$). This confirms a high prevalence of insufficient physical activity.

Multivariable logistic regression analysis (Table 2) indicated that age and academic rank were significant predictors of WHO guideline adherence (model $p < 0.001$). Staff aged

30-39 years were more likely to meet guidelines compared to those aged 60-65 years (AOR = 2.41, $p = 0.004$). Lecturer II (AOR = 2.88, $p = 0.002$) and Lecturer I (AOR = 2.14, $p = 0.026$) were also significantly more likely to meet guidelines compared to Professors. Sex was not a significant independent predictor ($p = 0.260$).

Collectively, the results support the alternative hypothesis (H1), confirming that the majority of senior academic staff do not meet WHO recommended physical activity guidelines for aerobic, strength, and flexibility components. The statistically significant differences across all activity domains highlight a critical public health concern and underscore the urgent need for institutional and behavioural interventions to promote a more physically active academic workforce.

H2: Relationship between demographic factors (age, sex, occupation) and the physical activity levels of academic staff.

Table 6. Age Group Differences in Physical Activity Scores (ANOVA).

Age Group	M (SD)	F	P	Post-hoc (Tukey)
30-39	4.2(1.7)	8.76	<0.001***	30-39 > all older groups
40-49	3.5(1.6)			
50-59	3.1(1.5)			
60-65	2.8(1.3)			

3.4. Statistical Interpretation

The one-way ANOVA comparing mean physical activity scores across age groups revealed a statistically significant difference ($F = 8.76$, $p < 0.001$). Post-hoc Tukey tests showed that the youngest group (30-39 years; $M = 4.2$, $SD = 1.7$) had significantly higher physical activity scores than all older age

groups. As age increased, physical activity levels decreased, with the oldest group (60-65 years) recording the lowest mean score ($M = 2.8$, $SD = 1.3$). This finding reinforces the conclusion that age is a significant factor in determining physical activity behaviour, with younger academic staff being more physically active.

Table 7. Academic Rank Differences (ANOVA).

Rank	M (SD)	F	P	Post-hoc
Lecturer II	4.4(1.9)	6.89	<0.001***	LII > all higher ranks
Lecturer I	4.1(1.8)			
Senior Lecturer	3.6(1.7)			
Associate Prof	3.0(1.4)			
Professor	2.7(1.2)			

3.5. Statistical Interpretation

The ANOVA for academic rank also revealed statistically significant differences in physical activity levels across groups ($F = 6.89$, $p < 0.001$). Post-hoc analysis showed that Lecturer II staff ($M = 4.4$, $SD = 1.9$) reported significantly

higher physical activity than all higher-ranking staff, with Professors reporting the lowest mean activity levels ($M = 2.7$, $SD = 1.2$). This result confirms that lower-ranked academic staff are more active than their senior colleagues, possibly due to differences in workload types, age, or lifestyle constraints associated with higher administrative responsibilities.

Table 8. Sex Differences (Independent t-test).

Sex	M (SD)	T	P	Cohen's d
Male	3.8(1.9)	3.21	0.001**	0.37
Female	3.1(1.7)			

3.6. Statistical Interpretation

The independent t-test comparing male and female respondents showed a statistically significant difference in physical activity levels ($t = 3.21$, $p = 0.001$), with males ($M = 3.8$, $SD = 1.9$) being more active on average than females (M

$= 3.1$, $SD = 1.7$). Although statistically significant, the effect size (Cohen's $d = 0.37$) suggests a small to moderate practical difference between sexes. This implies that while sex may not be a strong categorical determinant, as shown in the chi-square analysis, it may influence the magnitude of physical activity in terms of average intensity or frequency.

Table 9. Chi-square test between categorical demographic variables.

Demographic	χ^2	df	p-value	Cramer's V
Age Group	28.74	9	0.001**	0.18

Demographic	χ^2	df	p-value	Cramer's V
Sex	4.32	3	0.229	0.12
Academic Rank	32.18	12	0.001**	0.23

3.7. Statistical Interpretation

The Chi-square test assessed associations between categorical demographic variables (age group, sex, and academic rank) and physical activity levels.

For age group, a significant association was found ($\chi^2 = 28.74$, $df = 9$, $p = 0.001$), with a Cramer's V value of 0.18, indicating a small to moderate effect size. This suggests that physical activity levels significantly differ across age groups, supporting the hypothesis that age influences activity engagement.

For sex, no statistically significant relationship was observed ($\chi^2 = 4.32$, $df = 3$, $p = 0.229$), and the effect size was small (Cramer's V = 0.12). This implies that physical activity levels among senior academic staff do not differ significantly between males and females, suggesting sex is not a strong determinant in this context.

For academic rank, a significant relationship was detected ($\chi^2 = 32.18$, $df = 12$, $p = 0.001$), with Cramer's V = 0.23, indicating a moderate effect size. This shows that physical activity levels vary significantly across academic ranks, with lower-ranking staff engaging more in physical activity than their higher-ranking counterparts.

H3: The majority of academic staff fall within the sedentary to under-active categories based on aerobic physical activity assessment.

Table 11. Sedentary-Under-active.

Category	Observed%	Test%	z-score	p-value
Sedentary+Under-active	91.6%	50%	14.93	<0.001***

3.8. Statistical Interpretation

The hypothesis tested whether a significantly higher proportion of senior academic staff fall into the sedentary or under-active categories, compared to a test proportion of 50%, which represents an ideal benchmark for balanced activity levels. The results from the one-sample binomial test revealed that 91.6% of respondents were either sedentary or under-active, which is significantly higher than the hypothesized benchmark of 50%. The test yielded a z-score of 14.93 with a

p-value < 0.001, indicating a highly statistically significant difference. This result confirms the hypothesis that the overwhelming majority of senior academic staff do not meet sufficient physical activity standards. The proportion of those failing to reach recommended levels of physical activity is alarmingly high, far exceeding the expected threshold, and demonstrates a serious prevalence of physical inactivity within this population.

4. Discussion

The discussion is based on the analysis of primary data collected from 300 respondents using the Rapid Assessment of Physical Activity (RAPA-1 and RAPA-2) and evaluated through both descriptive and inferential statistical methods [34]. The findings are interpreted using Social Cognitive Theory (SCT) as a conceptual lens rather than as an empirically tested theoretical model, since specific SCT constructs were not directly measured in this study [36-38]. Relevant empirical studies are integrated to contextualize consistencies and divergences in findings [39, 40].

What is the level of aerobic physical activity among senior academic staff in Delta State University, Abraka? The RAPA-1 results indicate that aerobic physical activity levels among senior academic staff were predominantly low to moderate. While some respondents reported engaging in light-to-moderate activities such as walking or jogging, only a small proportion met vigorous-intensity thresholds recommended by the World Health Organization [44]. This pattern aligns with findings among university employees and similar occupational groups characterized by sedentary work routines [2, 41-43].

Age was significantly associated with aerobic activity levels ($\chi^2 = 11.378$, $p = 0.01$). Younger staff (35-44 years) were more likely to engage in moderate-to-vigorous activity compared to those aged 55 years and above. Similar age-related declines in physical activity have been documented among sedentary workers [45]. Physiological changes, increased administrative workload, and competing responsibilities may contribute to this trend.

Sex differences were also observed. Male academic staff recorded significantly higher mean aerobic scores ($M = 4.28$, $SD = 1.14$) than females ($M = 3.89$, $SD = 1.36$), $t(298) = 2.78$, $p = 0.006$ (Table 2). This disparity may reflect sociocultural influences on exercise behaviour in Nigerian academic environments [47]. From an interpretive SCT perspective, environmental reinforcement and role modelling within institutional settings may shape patterns of aerobic engagement [36, 46].

What is the level of strength training among senior academic staff in Delta State University, Abraka? Participation in strength training was notably low. Only 24.7% reported engaging in resistance exercises at least once weekly, while 75.3% reported no regular participation. This finding is concerning given established evidence linking resistance exercise to improved musculoskeletal health, metabolic regulation, and prevention of sarcopenia [4, 48-52]. Sex was significantly associated with strength training participation ($\chi^2 = 13.206$, $p = 0.000$). Male staff reported higher mean strength scores ($M = 2.66$, $SD = 0.84$) than female staff ($M = 2.34$, $SD = 0.75$), $t(298) = 3.42$, $p = 0.001$. Similar gender patterns have been reported in other populations [43, 47]. These findings may reflect differences in perceived appropriateness of resistance training and access to facilities. Institutional barriers, including limited campus-based strength-training programs, may further reduce participation. Within the SCT framework, environmental support and behavioural capability are relevant interpretive constructs [36, 53].

What is the level of flexibility training among senior academic staff in Delta State University, Abraka? Flexibility training was the least practiced activity domain. Only 15.3% of respondents engaged in stretching or mobility exercises at least twice weekly, while 84.7% reported no structured flexibility routines. Given the role of flexibility in joint health and injury prevention, particularly in aging populations [49], this represents an important health gap. A significant association was found between sex and flexibility participation ($\chi^2 = 7.483$, $p = 0.024$). Female staff reported slightly higher mean flexibility scores ($M = 2.46$, $SD = 0.70$) than males ($M = 2.22$, $SD = 0.63$), $t(298) = -3.12$, $p = 0.002$. While sociocultural perceptions may influence engagement patterns [47], the broader concern remains the overall low prevalence across both sexes. From an institutional standpoint, absence of structured flexibility programs may limit routine adoption.

To what extent do senior academic staff meet WHO physical activity guidelines? When WHO physical activity guidelines were operationalized using combined aerobic, strength, and flexibility criteria, only 37.3% of respondents met recommended standards. This low compliance rate signals a substantial public health concern. Multivariable analysis demonstrated that academic rank significantly predicted adherence, with junior lecturers more likely to meet guidelines than professors and senior lecturers ($\chi^2 = 12.482$, $p = 0.015$; $t(298) = 2.98$, $p = 0.003$). Higher-ranking staff may experience increased administrative demands and time constraints that reduce opportunities for structured exercise. Comparable trends have been observed in international academic settings [9, 26]. These findings underscore the need for institutional strategies that integrate physical activity into work routines and leadership-supported wellness initiatives [54].

What is the level of sedentary behaviour among senior academic staff in Delta State University, Abraka? Sedentary behaviour was highly prevalent, with staff averaging more than seven hours of sitting per day. This is consistent with research

indicating elevated occupational sitting among university employees [55-59]. Age was significantly associated with sedentary duration ($\chi^2 = 9.314$, $p = 0.017$), and males reported slightly longer sitting times than females (male: $M = 7.3$ hrs/day; female: $M = 6.8$ hrs/day), $t(298) = 2.23$, $p = 0.027$. Prolonged occupational sitting has been linked to cardiometabolic and musculoskeletal risks [55]. Workplace structure and organizational culture likely contribute to normalized sedentary patterns [52]. Institutional-level interventions, including ergonomic redesign and structured activity breaks, are therefore essential [1, 44].

SCT provides a useful interpretive framework for understanding how personal factors and environmental conditions may interact to influence behaviour [36, 46]. However, since constructs such as self-efficacy and outcome expectations were not directly measured, the theory is applied here conceptually rather than empirically. While SCT explains individual-level behavioural tendencies, broader structural determinants including workload, policy limitations, and institutional infrastructure also shape physical activity patterns [44, 56]. Complementary ecological perspectives may therefore enhance future intervention design.

5. Conclusion

This study investigated the physical activity levels among academic staff in Delta State University, Abraka, using a structured approach grounded in the Social Cognitive Theory (SCT) and guided by five core research questions. The findings offer a comprehensive understanding of the patterns, disparities, and challenges surrounding physical activity behaviours within this population. The study concluded that while a moderate proportion of academic staff engaged in aerobic physical activity, only a minority reached the vigorous-intensity levels recommended by the World Health Organization. Strength and flexibility training were notably lower, with participation levels well below the standards needed for optimal health maintenance. Adherence to WHO guidelines for comprehensive physical activity including aerobic, strength, and flexibility training was limited to only 37.3% of respondents, underscoring a significant gap in physical activity compliance among this occupational group. Demographic variables such as age, sex, and academic rank were found to significantly influence physical activity behaviours. Younger staff members and males reported higher activity levels in aerobic and strength training, while flexibility training was slightly more prevalent among female staff. Senior academic staff, particularly those in professorial and administrative roles, were less likely to meet activity guidelines, possibly due to time constraints and sedentary job demands. The prevalence of sedentary behaviour was alarmingly high, with staff averaging over 7 hours of sitting per day. This highlights the occupational nature of academia as a largely sedentary profession, with long hours dedicated to teaching, research, meetings, and administrative duties.

The application of Social Cognitive Theory proved effective in contextualizing the interplay between personal efficacy, behavioural capability, environmental influences, and observed role models. However, the theory's limitations in accounting for broader structural and institutional barriers indicate a need for complementary models such as the Social Ecological Model to design effective interventions. In summary, the physical activity profile of senior academic staff at Delta State University, Abraka, reflects a pressing public health concern. Without immediate and tailored intervention, this group remains at risk for chronic lifestyle diseases associated with physical inactivity. A shift in institutional culture and support systems is essential to reverse these trends.

7. Recommendation

Introduce university-led fitness initiatives tailored to academic staff schedules, including group exercises and health awareness campaigns. Equip the university with accessible gyms, walking tracks, and flexibility zones to promote daily movement. Appoint wellness ambassadors and promote peer-led activities to foster motivation through role modelling. Design inclusive programs that accommodate the unique needs of female staff and challenge fitness stereotypes. Encourage active breaks, standing meetings, and ergonomic office setups to minimize prolonged sitting. Institutional support is vital. Senior management should integrate physical activity into university policy and budgeting. Conduct periodic assessments to track participation rates, evaluate program impact, and inform improvements.

Abbreviations

PA	Physical Activity
RAPA	Rapid Assessment of Physical Activity
WHO	World Health Organization
SCT	Social Cognitive Theory
ANOVA	Analysis of Variance
SPSS	Statistical Package for Social Sciences

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Conflicts of Interest

The authors declare no conflicts of interest.

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