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Stress and Physical Activity Levels of Undergraduates: A Case Study of University of Nigeria, Nsukka

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Abstract

The study examined stress levels and physical activity levels of undergraduate students of University of Nigeria, Nsukka (UNN). Specifically, it compared stress level and physical activity (PA) levels across gender, academic levels, fathers and mothers' education level. Descriptive survey research design was adopted. Population was made up of undergraduate students of University of Nigeria, Nsukka. Perceived stress scale and physical activity questionnaire short form were used for data collection. Descriptive statistics were reported using frequencies, percentages, mean and standard deviation while hypotheses were tested using chi-square test. The result revealed that above one tenth (10.5%), more than two thirds (78.8%) and above one tenth (10.7%) of the participants had low, moderate and high stress. Moreover, less than one third (26%), above two thirds (66.5%) and less than one tenth (7.5%) of the participants had low, moderate, and high physical activity levels. Chi-square test on the stress levels of the undergraduates was significant on gender, X^2 (2, 439) = 10.804, p = .00 but not significant on academic level X^2 (2, 439) =.478, p = .79. With respect to PA levels, chi-square was significant on gender X^2 (2, 439) =17.342, p = .00, but not significant on academic level X^2 (2, 439) .085, p = .96.

Key Words: Undergraduates, Stress, Physical, Activity, Stress, Level, Gender, Case Study

Introduction

Undergraduate students experience stress as a result of academic and socio-economic challenges which impacts their academic performance. Stress is a state of mental or physical strain arising from the culmination of a person's emotional, mental, and physical pressures (Solanky, 2012 & Mahdzar, 2022). Stress is a sensation of mental or physical strain that students experience as they deal with demanding situations and assignments related to their academic endeavors. According to Mehfooz et al., (2017) academics demand is the major source of student's stress. Common stressors among students include academic overload, poor rest, financial constraints and uncertainty about future employment. (Kashif et al, 2013; Kauser, 2015 & Suleyiman & Zewdu, (2018)). Transforming education (2024) reports that over 60% of student's experience stress in the course of their academic

pursuit. Undergraduate students of University of Nigeria, Nsukka (UNN) are expected to experience more stress due to rigorous academic standards that distinguish UNN from other Nigerian universities. In addition, Nigeria's political instability are expected to increase the stress levels of undergraduate students.

According to World Health Organization (WHO 2023), typical signs of stress include fatigue, anxiety, irritability, sleep problem and appetite changes. Students who successfully control their stress may do well academically, while those who do not may experience health issues like anxiety, headaches, upset tummies, hypertension, and insomnia (Oduwaiye et al., 2017). Unmanaged stress can cause physical changes that affect a person's emotional, mental, social, and physical responses. Stress level is measured with a 10 item perceived stress scale (PSS) developed by Cohen, Kamarck and Mermeltein (1983). Research indicates that ongoing stress is linked to poor overall health (Ribeiro et al, 2017). According to Pascoe et al. (2020), high stress levels can lower students' self-esteem, impair performance, and increase dropout and unemployment risks. According to Moylan et al. (2013), ongoing stress can result in more severe mental health conditions including anxiety and depression. Demographic factors such as gender, academic level can make a group more vulnerable to academic stress. For instance, females report more academic stress than males (Barbayannis et al, 2022). Academic level dispose one to stress as it is assumed that academic demand gets tougher as one climbs academic ladder, though students in higher academic level could develop more coping strategy to stress than others. However, students can only succeed academically when an effective intervention is implemented to reduce perceived academic stress. According to WHO (2023) regular engagement in physical activity (PA) is one of the most effective way to avert or manage stress.

Physical activity is well known to improve both physical and mental health, including stress reduction. According to WHO (2023) physical activity includes all energy-demanding body movements done at work, transport, domestic, or leisure tasks. Physical activity is classified as low, moderate, or vigorous, depending on intensity (e.g. light walking for low, brisk walking for moderate and jogging for vigorous exercise that greatly elevates the heart rate and breathing). The PA level is measured in Metabolic Equivalent Task (MET) which is the unit used to measure the energy cost of each category of PA intensity. The MET value for low PA is 3.3 METs, for Moderate PA is 4 METs and high PA is 8 METS. Energy consumption volume for each categories is calculated as METS x time spent in the activity x days' activity is done (Craig et al, (2003),). Participation in PA offers several benefits to mental health, it boosts the hypothalamus-pituitary-adrenal (HPA) axis's function, lowers cortisol levels, balances ghrelin and leptin, increases epinephrine and stimulates endorphin production for improved

mood and stress relief (Mahindru, 2023). It also provides opportunity for social interaction and support which help to avert loneliness and isolation associated with stress (Teles et al, 2018; Harvard Health, 2020). Given the rigorous academic intensity at UNN, it is plausible that students de-emphasize physical activity due to limited time and motivation, focusing instead on meeting curriculum requirements. Gender and academic level can exert influences on students PA participation.

Studies have been carried out on perceived academic stress of undergraduate students in the Southern part of Nigeria (Adegboyega, 2019 & Adedamola et al, 2022) but to the best knowledge of the researchers no such study has been conducted in the South-East Geo-political region of Nigeria. Also, none of those studies assessed students PA levels reported in literature as a buffer to stress, hence the need for the present study. In line with above, determining academic stress levels and physical activity levels of UNN undergraduate students is of essence to provide baseline data for intervention to prevent or lower students' academic stress and the need to boost their PA level. The study also adds to existing literature.

Objectives of the Study

The study investigated the stress and physical activity (PA) levels of undergraduates in University of Nigeria, Nsukka. Specifically, it determined:

1. stress levels of undergraduate students of UNN,
2. differences in stress levels of undergraduates based on gender, academic level.
3. physical activity levels of UNN undergraduates,
4. differences in PA levels based on gender, academic levels.

Hypotheses (HOs)

1. There is no significant difference on stress levels of UNN undergraduates based on gender and academic level.
2. There is no significant difference on physical activity levels of UNN undergraduates based on gender and academic levels.

Methodology

***Research design*:** A descriptive cross-sectional survey research design was employed on a population of all the undergraduate students of UNN.

***Area of the study*:** The study was conducted at University of Nigeria. It is a Federal government university located in Nukka, Enugu State, and Eastern part of Nigeria. University of Nigeria has three campuses in Enugu State which includes Nukka, Enugu Ituku-Ozara. The study was conducted in one of the main campuses of the university. The campus has eleven Faculties. Undergraduates of UNN encounter various stressors, such as, rigorous curriculum, financial challenges, environmental factors among others. These stressors are exacerbated by some demographic variables such as gender, academic level etc.

***Population for the Study*:** The population for the study comprised of all the 36,000

regular students registered in the 2023/24 academic session (UNN Academic Planning Unit). The population is made up of male and female students who are in different academic levels pursuing their career choices.

***Sample for the Study*:** Sample for the study was determined using Yamane (1967) formula n = N/(1+N(e)2 on a population of 36,000 undergraduates, which gave 396 participants. To guard against attrition (poor return or non-response rate), a 20 percent of the figure obtained with the formula (i.e. 396 x 20/100 = 79) was added. This gave the final sample size for the study as 475 participants (i.e. 396 + 79 = 475). Multistage sampling technique was used to select a sample of 475 students from the sampled faculties in Nsukka main campus. The first stage involved drawing three faculties from the eleven faculties at Nsukka campus using simple random sampling without replacement technique (Education, Social Sciences and Pharmaceutical Sciences). In the second stage two departments each was drawn from the three selected faculties. In the third stage 20 percent of the student's population in each drawn department was conveniently selected to participate in the study as follows (Education Foundation = 133, Human Kinetics and Health Education = 63, Psychology = 52, Science = 70, Pharmaceutical = 82 and Pharmacology and Toxicology= 75).

***Instrument for Data Collection*:** The study adopted two standardized instrument. Stress was assessed using a 10 item self-report perceived stress scale (PSS) developed by Cohen, Kamarck and Mermeltein (1983) that measures perceived stress on five likert scale, (never, almost never, sometimes, fairly often and very often scored 0, 1, 2, 3, and 4 respectively). Cohen et al (1983) reported Cronbach's α (Alpha) reliability of PSS between .84 – 86 while the present study reliability coefficient is .65.

Physical activity was measured using the International Physical Activity Questionnaire – Short Form (IPAQ-SF) developed by Craig et al, (2003), which ask questions on the past one week recall of engagement in low, moderate and vigorous PA intensity such as, "about how many minutes and days in a week one spent doing low PA such as walking; moderate PA intensity such as brisk walking that makes one breath harder, vigorous or high PA intensity such as jogging or digging that makes one breath heavily. The overall PA was got by adding scores from the three PA domains (low, moderate and vigorous).

***Data Collection Methods*:** A letter of introduction was given to the Heads of sampled Department, who introduced the researcher to the students and solicited for their co-operation in giving response. The PSS and IPAQ-SF questionnaire were distributed to the sampled respondents and collected immediately after completion. Out of 475 copies distributed 36 copies were lost due to incomplete responses and inability to return the questionnaire. The remaining 439 copies of questionnaire gave a return rate of 92.4 percent.

***Data Analysis Technique*:** SPSS version 25 was used to analyze the data. A criterion mean of 2.5 and above indicates items that constitute stress. The stress level was determined by adding the scores for the 10 items with items 4, 5, 7 and 8 reverse scored in line with the developer's scoring protocol (Cohen, Kamarck and Mermeltein 1983). The PSS has a range of scores between 0 – 40. A higher score indicates more stress. Scores from 0 – 13 indicates low stress, scores from 14 – 26 shows moderate stress while scores from 27 – 40 signifies high stress (Adedamola, 2022). The weekly PA energy expenditure or intensity score for the three domains (low, moderate and high intensity activities) were calculated in units of METs as follows, low PA = (3.3 METs x time x number of days) + moderate PA= (4 METs x time x number of days) + high PA= (8 METs x time x number of days). TO get the PA levels, the total MET values (i.e. low + Moderate + high) were categorized again into three groups as follows; low PA level (< 600 MET-min/week i.e. insufficiently active), moderate PA level (600 MET-min/week to < 3,000 MET-min/week), and high PA (≥3,000 MET-min/week i.e. health enhancing PA). Descriptive statistics were reported in Mean, standard deviation, frequencies and percentages. Chi-square statistics was used to test the null hypotheses at 0.05 level of significance.

Results

Table 1: Mean and Standard Deviation on Overall Responses to Perceived Stress indicators (n = 439)

S/N	Stress Indicators	$\bar{X}$	SD
1	How often have you been upset because of something that happened unexpectedly	2.25	1.42
2	How often have you felt that you were unable to control the important things in your life	2.05	1.27
3	How often have you felt nervous and stressed	2.73	1.18
4	Felt confident about your ability to handle your personal problem	1.44	1.28
5	Felt that things were going your way	1.67	1.16
6	Found that you could not cope with all the things that you had to do	2.16	1.12
7	Been able to control irritations in your life	1.72	1.15
8	Felt that you were on top of things	1.99	1.21
9	Been angered because of things that is outside of your control	2.15	1.24
10	Felt difficulties were piling up so high that you could not overcome them	1.99	1.35
	Overall Mean	**2.02(1.24)**	

$\bar{X}$= Mean; SD = Standard Deviation

Table 1 shows the overall mean indicates moderate perceived stress among students'. Based on Table 1 item 3 contributes most to student's stress followed by items 1, 6, 9 and 2 with means of (2.72, 2.25, 2.16, 2.15 and 2.05).

Table 2: Mean and Standard Deviation on Responses to Perceived Stress indicators by Gender and Academic Level

						Academic Level 100/200		400/Above	
S/N	**Indicators**	$\bar{X}_1$	**SD₁**	$\bar{X}_2$	**SD₂**	$\bar{X}_3$	**SD₃**	$\bar{X}_4$	**SD₄**
1	How often have you been upset because of something that happened unexpectedly	1.99	1.33	2.41	1.46	2.41	1.25	2.12	1.53
2	How often have you felt that you were unable to control the important things in your life	1.91	1.25	2.14	1.28	2.17	1.30	1.95	1.24
3	How often have you felt nervous and stressed	2.49	1.09	2.90	1.21	2.73	1.17	2.74	1.18
4	Felt confident about your ability to handle your personal problem	2.61	1.24	2.52	1.30	2.70	1.32	2.45	1.24
5	Felt that things were going your way	2.50	1.20	2.23	1.12	2.39	1.18	2.30	1.15
6	Found that you could not cope with all the things that you had to do	2.01	1.19	2.27	1.07	2.07	1.12	2.23	1.12
7	Been able to control irritations in your life	2.16	1.20	2.35	1.11	2.32	1.18	2.24	1.13
8	Felt that you were on top of things	1.85	1.29	2.12	1.14	2.07	1.21	1.96	1.21
9	Been angered because of things that is outside of your control	1.91	1.32	2.31	1.16	2.33	1.22	2.02	1.24
10	Felt difficulties were piling up so high that you could not overcome them	1.71	1.31	2.17	1.40	2.09	1.28	1.92	1.40
	Total	**2.11**	**1.24**	**2.34**	**1.23**	**2.33**	**1.22**	**2.19**	**1.24**

$\bar{X}_1$ = Mean responses of males; SD_1 = Standard deviation of male; $\bar{X}_2$ = Mean responses of female; SD_2 = Standard deviation of female; $\bar{X}_3$ = Mean responses of 100/200 level students; SD_3 = Standard deviation of 100/200 level students; $\bar{X}_4$ = Mean responses of 400/above level students; SD_4 = Standard deviation of 400/above level students.

Table 2 shows that all the groups had moderate stress. However, females (M= 2.34, SD = 1.23) had more stress than males (M =2.11, SD =1.24). In academic level 100/200 levels (M= 2.33, SD = 1.22) had more stress than academic level 400 and above (M = 2.19, SD = 1.24). Item 3 constitute a source of stress to all the groups.

Table 3: Frequencies and Percentages of Responses on Categories of Perceived Stress

Variable	N	Low f(%)	Moderate f(%)	High f(%)	X^2	df	*p-val*
Overall Stress level	439	46(10.5)	346(78.8)	47(10.7)			
Gender							
Male	173	25(14.5)	138(79.8)	10(5.8)	10.804[a]	2	.00
Female	266	21(7.9)	208(78.2)	37(13.9)			
Academic Level							
100-200	189	22(11.6)	147(77.8)	20(10.6)	.478[a]	2	.79
300 and Above	250	24(9.6)	199(79.6)	27(10.6)			

X^2 = chi-square, N number of participants, df = degree of freedom, p-val = p-value

Table 3 shows that 10.5%, 78.8% and 10.7% respectively of the participants had low, moderate and high perceived academic stress. In terms of gender more males 14.5% and 7.9% of females experienced low stress. Almost equal proportion 79.8% and 78.2% of males and females experienced moderate stress. However, more 13.9% of the females as against 5.8% of the males experienced high tress. The chi-square test indicated statistical significant difference between gender X^2 (2, 439) = 10.804[a], p = .00. In terms of academic level 11.6% and 9.6% of those in academic levels 100-200 and 300 and above had low stress. More 79.6% of 300-Above academic levels and 77.8% of 100-200 academic levels experienced moderate stress. Equal proportion, 10.6% and 10.6% of all the academic levels experience high stress. The chi-square test revealed no statistically significant difference between academic levels, X^2 (2, 439) = .478[a], p = .79.

Table 4: Frequencies and Percentages of Physical Activity Levels

Variable	N	Low f(%)	Moderate f(%)	High f(%)	X^2	df	p-val
Overall PA Level	439	114(26.0)	292(66.5)	33(7.5)			
Gender							
Male	173	38(22.0)	111(64.2)	24(13.9)	17.342[a]	2	.00
Female	266	76(28.6)	181(68.0)	9(3.4)			
Academic level							
100-200	189	49(25.9)	125(66.1)	15(7.9)	.085[a]	2	.96
300 and Above	250	65(26.0)	167(66.8)	18(7.2)			

X^2 = chi-square, N number of participants, df = degree of freedom, p-val = p-value

Table 4 indicates that 26%, 66.5% and 7.5% of the participants respectively had low, moderate and high PA levels. With regards to gender, variations exist in low,

moderate and high PA levels between male and female students. The variation resulted in a statistical significant difference in gender X^2 (2, 439) = 17.342, p = .00. In academic level, differences in proportion of low, moderate and high PA levels exist but they were not statistically significant, academic levels, X^2 (2. 439) = .085[a], p = .96 (Table 3).

Discussion

The study aimed to assess undergraduates' stress and PA levels and how regular PA contributes to stress reduction. In Table 1 item 3 contributes most to student's stress followed by items 1, 6, 9 and 2 with means of (2.72, 2.25, 2.16, 2.15 and 2.05). Table 3 shows that about one-tenth, over two-thirds, and slightly above one-tenth of participants experienced low, moderate, and high stress levels, respectively. Stress levels differed by gender and academic level, with a significant difference by gender (Table 3, P = .00) but not by academic level. The proportion of stressed students in this study was lower than the 84.4% reported among Aialkot University undergraduates by Asif et al. (2020).

The findings align with Bryant and Welding (2024), who reported 76% of college students with moderate to severe stress, and Transforming Education (2024), which found 60%. However, the findings are not surprising given Nigeria's economic crisis, which likely strained students' finances and increased stress. For instance, many students struggle to afford two meals daily or meet basic academic expenses like books and printing of assignments, to name a few. Such academic stress may reduce motivation, hinder performance, and increase dropout rates among undergraduates (Pascoe et al., 2020). Such academic stress can cause mental health issues like anxiety and depression and lower quality of life (Moylan et al., 2013; Green et al., 2022; Ribeiro et al., 2017). Since physical activity reduces perceived stress, the study urges university administrators to promote regular student participation in it (Baruth, 2011). PA reduces levels of the body's stress hormones such as adrenaline and cortiscol as well as stimulates the production of endorphins, chemicals in the brain that are body's natural painkillers and mood enhancers (Harvard Health, 2020).

For research question 3, results showed that most students (66.5%) had moderate PA levels, 7.5% high (health-enhancing), and 26.0% low. The result was unexpected, as most were expected to have low PA levels. The 26.0% with low PA aligns with Oladejo et al. (2023), who reported 26.9% at the University of the Witwatersrand, South Africa. The majority's moderate PA level may explain the low rate of high stress, supporting findings that PA enhances stress coping (Hubbs et al., 2012). Economic hardship and rising fuel prices in Nigeria may have compelled students to rely more on active transportation than motorized transportation. This probably led to the notable improvement in PA levels. Physical activity aids stress recovery by releasing endorphins and other chemicals

that offset negative effects of stress (Mayo Clinic, n.d.). However, since economic hardship likely influenced PA levels, students may not sustain engagement once conditions improve, as participation was not self-motivated.

For research question 4, results showed a significant gender difference in PA levels, aligning with studies that males are more active than females (Bergier et al., 2016; McCarthy & Warne, 2022). The low proportion of participants who attained high PA level (the health enhancing level) is a concern, thus requires proactive strategies such as awareness creation, counseling by the university administration to promote mass engagement of students in regular PA to avert academic stress. This is very crucial as Oladejo et al (2023) reported that a high level of PA is a predictor of health-related quality of life among the student.

Conclusion

The findings of the study show that a good proportion of the undergraduate students of UNN experience different levels of stress. Gender is a significant factor in the perceived levels of stress among the students. Also majority of the participants attained moderate PA level with significant difference in PA levels by gender. It follows that the stress and physical activity levels of the undergraduates need to be given some appropriate attention. Stress levels need to be reduced and physical activities enhanced.

Recommendations

Base on the findings university administration should:

1. Create forum to educate the students to manage stress effectively to avoid adverse effect of stress on their health and academic performance.
2. Create free lecture intervals and include physical activity breaks during lengthy lecture sessions that do not interfere with undergraduate students' academic work.
3. Provide students with unrestricted use of the school fitness centers or arrange group exercise sessions through student organizations or clubs.
4. Mainstream gender into interventions on stress reduction and physical activity engagements.

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