

Prevalence of Obesity and Physical Inactivity among Biomedical College Students in a Nigerian University

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ABSTRACT

Problem Statement: College years expose young adults to unhealthy lifestyle changes. With the rising global disease burden associated with physical inactivity and obesity, there is a need to investigate health-related behaviours in college students. The aims of this study was to evaluate the prevalence of physical inactivity and obesity among first and final year college students in selected healthcare professions; and to compare the prevalence between the two classes.

Approach: A descriptive study involving 182 participants (86 males and 96 females) between the ages of 16 and 31 years was carried out. Physical activity level was assessed using the self-administered International Physical Activity Questionnaire (IPAC- long format); while obesity was evaluated using the World Health Organization obesity classification.

Results: The prevalence of physical inactivity in the study population was high (49.5%): 44% and 55% among first and final year students respectively. Prevalence of obesity among study population was nil, but 27 participants (14.9 %) were overweight; out of which 23 (89% of the overweight population) were first year students and 8 (30% of the overweight students) were physically inactive. Comparison between the two levels of study showed no significant difference in the prevalence of physical inactivity; but the first year students had a significantly higher proportion of overweight students than the final year students.

Conclusion and Recommendation: A high prevalence of physical inactivity was observed in this study which suggests that a high percentage of students in this study had less physical activity than recommended by health authorities. Hence, efforts should be made to reinforce physical activity among this population.

Key words: Physical Inactivity, Obesity, Biomedical Students

INTRODUCTION

Physical inactivity is associated with a decreased life expectancy and an increased risk of cardiovascular diseases ^[1]. Physical inactivity is associated obesity and both are risk factors for developing chronic diseases ^[2]. Delahanty et al ^[3] estimated that physical inactivity accounts for 24% of the risk of developing type II diabetes. The upsurge of type II diabetes and hypertension has been attributed to the growing prevalence of overweight, obesity and declining physical activity worldwide, especially during childhood and adolescent stages of life ^[4]. College years have been considered a critical transition period between adolescents and adulthood ^[5]. Many health-related lifestyle changes such as poor food choices and low-calorie expenditure physical activities that predispose young adults to excess calorie intake and less physical activity are established during this period ^[6,7]. Senbanjo and Oshikoya ^[8] also noted that chronic health problems in adulthood are traceable to these habits from adolescents.

As the burden of diseases associated with physical inactivity and obesity is increasing worldwide, students and practitioners in healthcare profession are expected

to be crusaders in prevention and management of obesity and its related disorders. While it has been that established poor dietary choices and low calorie expenditure physical activities are reinforced during college years generally, there is dearth of published data on the prevalence of obesity and physical inactivity among undergraduates students of healthcare professions. The specific aims of this study were (1) to evaluate the prevalence of Physical Inactivity, Obesity and Overweight among undergraduate students in selected health care professions; and (2) to compare the prevalence between first and final year students.

MATERIALS AND METHODS

Ethical approval was obtained from the University of Ibadan/University College Hospital Ethical Committee and Informed Consent was sought and obtained from participants. Recruitment was done through public announcement in hall of residence and lecture auditorium. Interested participants were registered and later contacted at their hall of residence. The assessment of the physical activity and body was conducted within the halls of residence. All participants benefited from increased awareness on health implications of obesity and physical inactivity and counseling how to

improve physical activity and maintain a healthy lifestyle while in college.

Subjects: A convenience sample was used to recruit participants for the study so as to enroll as many students as possible. A total of 182 participants, 46% of eligible candidate participated in the study. The study sample comprised of 86 males and 96 females, within the age range of 16-31 years. Participants were first year and final year undergraduate students in Medicine and Surgery, Dentistry and Physiotherapy programmes of the University of Ibadan.

Instrumentation: Self-administered International Physical Activity Questionnaire (IPAC- long format) was used to assess physical activity level. It assesses specific types of activity of walking, moderate-intensity activities, and vigorous - intensity activities, which are described in four domains. The domains include: leisure time physical activity, domestic and gardening activity, work-related activity and transport related activity. Data from IPAQ was reported in one of the three categories of 'low', 'moderate' and 'high' [9]. In accordance with WHO classifications, participants were classified into physically active and

physically inactive groups. The active group consisted of persons with a high and moderate physical activity levels while the inactive group comprised of persons who had a low level of physical activity.

Weight and height of participants were measured to calculate the BMI. A clinical weighing scale (Hanson-Ireland) calibrated in kilogrammes was used to measure the participants' weight. Participants stood erect bare-foot on the weighing scale while looking ahead with hands held on either side of the body. The body weight was then read off to the nearest 0.1 kilogrammes. Height of participants was measured in meters using a stadiometer (SECA 220-Germany). Participants stood barefoot, with their heads straight and their back against the upright height meter. The perpendicular bar (lever arm of the height meter) was brought in contact with the vertex of the participants' heads with a light pressure applied on the bar. The height was then read off to the nearest 0.1 metres. Body mass index of participants was evaluated by dividing the weight in kilograms by the square of the height in meters. BMI was reported in one of the four categories 'underweight' for BMI <18.5; 'normal weight' for BMI between 18.5 and 24.9; 'overweight'

for BMI between 25 and 29.9; and 'obese' for BMI >30 [10, 11].

Data Analysis: Raw data from the physical activity questionnaire was cleaned in accordance to the IPAQ Research Committee. Qualitative analyses was carried out on the data and presented using descriptive statistics of frequency and percentage. Differences in proportions of PAL and BMI between the final year and first year students were compared using the Chi square test. Level of significance was set at $p < 0.05$.

RESULTS

The objectives of the study were to evaluate the prevalence of Physical Inactivity, Obesity and Overweight among undergraduate students in selected health care professions; and to check for any significant difference in the prevalence between the first year and final year students. 182 undergraduate students (86 males and 96 females) participated in this study with age ranging between 16 and 31 years. Table I shows the physical characteristics of participants.

Table 1: Physical Characteristics of Participants

	Age $\bar{X} \pm SD$	Weight $\bar{X} \pm SD$	Height $\bar{X} \pm S$	DBMI $\bar{X} \pm SD$
FIRST YEAR				
MBBS ($n=52$)	18.3±3.8	58.0±7.2	1.68±0.1	20.5±2.4
BDS ($n=21$)	18.5±3.1	55.4± 6.1	1.70±0.3	19.1±1.8
BPT ($n=18$)	18.8±2.4	54.7±5.8	1.68±0.2	18.5±2.3
Total ($n=91$)	18.5±2.7	56.1±6.4	1.69±0.2	19.5±2.1
FINAL YEAR				
MBBS ($n=52$)	25.1±3.2	65.7±7.7	1.72±0.2	22.3±1.7
BDS ($n=21$)	25.3±4.8	66.3±8.5	1.73±0.5	21.4±5.1
BPT ($n=18$)	24.5±2.4	62.8±5.8	1.71±0.5	21.4±2.1
Total ($n=91$)	25.3±3.4	64.9±6.7	1.72±0.4	21.7±2.9
TOTAL ($n=182$)	21.8±2.9	60.4±6.5	1.70±0.3	20.9±2.5

Key:

- X - Mean
- SD - Standard Deviation
- BMI - Body Mass Index
- MBBS - Medicine and Surgery Students
- BDS - Dental Students
- BPT - Physiotherapy Students

Table 2 illustrates the distribution of PAL of participants across the three categories. 31 (17%) had high PAL; 61(33.5 %) had a moderate PAL while 90 (49.5%) had a low PAL. 16 (17.6%) out of first year students had high PAL, while 35 (38.4%) had moderate PAL and 40 (44%) had low PAL. Among the final year students,

15 (16.5%) had high PAL, while 26 (28.5%) had moderate PAL and 50 (55%) had low PAL. According to the WHO classifications, the prevalence of physical inactivity was 49.5% among the total study population, 44% among the first year students and 55% among the final year students.

Table 2: Distribution of Physical Activity Levels of participants across the three categories

Categories	N	Low n (%)	Moderate n (%)	High n (%)
MBBS	52 (100%)	20(38.5%)	19(36.5%)	13(25%)
BDS	21(100%)	14(66.7%)	6(28.6%)	1(4.7%)
BPT	18(100%)	6(33.3%)	10(55.6%)	2(11.1%)
First Year	91(100%)	40 (44%)	35 (38.4%)	16(17.6%)
	Physically Inactive	44%	Physically Active	56%
MBBS	52(100%)	23(44.2%)	16(30.7%)	13(25%)
BDS	21(100%)	16(76.2%)	5(23.8%)	0(0%)
BPT	18(100%)	11(61.1%)	5(27.8%)	2(11.1%)
Final Year	91(100%)	50 (54.9%)	26 (28.6%)	15(16.5%)
	Physically Inactive	54.9%	Physically Active	45.1%
Total	182(100%)	90 (49.5%)	61 (33.5%)	31 (17%)
	Physically Inactive	49.5%	Physically Active	50.5%

Key:

- X - Mean
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Table 3 shows the prevalence of obesity and overweight among the participants. Out of the 182 participants, 27 (14.9%) participants were overweight; 142 (78%) had normal BMI while 13 (7.1%) were underweight. None of the participants was obese. In the first

year students, 24 (26.4%) were overweight, 63 (69%) had normal weight while 4 (4.4%) were underweight. Among the final students, 3(3%) were overweight, 79(87%) had normal weight while 9(10%) were underweight.

Table 3: Distribution of Body Mass Index of participants across the three categories

Categories	N	Overweight n (%)	Normal n (%)	Underweight n (%)
MBBS	52(100%)	10(19.2 %)	39(75%)	3(5.8%)
BDS	21(100%)	7(33.3%)	14(66.7%)	0(0%)
BPT	18(100%)	7(38.9%)	10(55.6%)	1(5.5%)
First Year	91(100%)	24 (26.4%)	63 (69.2%)	4 (4.4%)
MBBS	52(100%)	0(0%)	47(90.4%)	5(9.6%)
BDS	21(100%)	1(4.8%)	16(76.2%)	4(19%)
BPT	18(100%)	2(11.1%)	16(88.9%)	0(0%)
Final Year	91(100%)	3 (3.3%)	79 (86.8%)	9 (9.9%)
Total	182(100%)	27 (14.9%)	142 (78%)	13 (7.1%)

Key:

- X - Mean
- SD - Standard Deviation
- BMI - Body Mass Index
- MBBS - Medicine and Surgery Students
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Comparing the prevalence of physical inactivity between the two levels of study showed that final year students reported a higher prevalence of physical inactivity which was not significant compared to first year students ($p > 0.05$) as shown in Table 4. A p value of <0.05

was calculated for the difference in the prevalence of overweight between the first year and final year students as shown in Table 5. This indicates a significantly higher prevalence of overweight among the first year students.

Table 4: Comparison of physical inactivity prevalence between first year and final year students in selected healthcare profession

Categories	Physically inactive n (%)	Physically active n (%)	p-value
First Year (n=91)	40 (44%)	51 (56%)	0.06
Final Year (n=91)	50 (54.9%)	41 (45.1%)	

Table 5: Comparison of BMI categories between first year and final year students in selected healthcare profession

Categories	Overweight n (%)	Normal n (%)	Underweight n (%)	p-value
First Year (n=91)	24 (26.4%)	63 (69.2%)	4 (4.4%)	0.03
Final Year (n=91)	3 (3.3%)	79 (86.8%)	9 (9.9%)	

DISCUSSION

High proportions of students reported low PAL in the study and were consequently categorized as physically inactive. Physical inactivity prevalence was 44% among the first year students and 54.9% in the final year students. Conversely, a low proportion of students reported high PAL among the study population; 17.6% and 16.5% among

the first year and final year students respectively. The result of this study shows high prevalence of physical inactivity among biomedical students. This observation is supported by the findings of da Silva, et al., [12] which reported low PAL among biomedical students. This finding also agrees with several studies from different countries suggesting that college students are

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becoming more sedentary [13, 14, 15, 16, 17]. A higher prevalence of physical inactivity among the final year students is supported by the finding of Caspersen [5] and Kimm et al [18] that physical activity declines progressively from childhood to adolescents and from adolescents to early adulthood. The greatest deterioration was observed to occur between the ages of 15 and 18 years, and continues through age 29 years [5]. This could be explained in part to the nature of the teaching-learning method which involves sitting for prolonged hours to receive lectures in classrooms or read in library. Also, the rigour and scope of medical curriculum leaves little or no time for leisure time physical activity.

Though the prevalence of physical inactivity among first year student was also high, but was less compared with that of the final year students. The lower prevalence among the first year students may be due in part to the fact that while the final year students might have been accustomed to the built environment of the university, the first year students are likely to find their new environment physically demanding, especially when they often have to walk to their lecture halls from halls of residence and vice versa. Compared with the previous year in which they had to stay at home; usually spending extended hours

with the television and computer, this new routine may seem to them a sudden increase in physical activity. The observed sudden increase in the PAL, may take its toll on their physical work capacity.

It was observed that more females reported house and garden related activities than the males; while more males reported work-related activities than the females. Both genders reported high transport-related physical activities and low leisure-related activity. Most of the physical activity of the students is transport-related. Very few students reported taking part in leisure-related physical activities. This is supported by the study of Ameen and Fawole [15], which reported that college students rarely participate in leisure-time physical activity. They suggested that low participation in leisure-related activities may be due to inadequate time, lack of value given to exercise at school and inadequate sporting facilities. Though more final year students reported low PAL than the first year students, but there was no significant difference when the prevalence of physical inactivity between the two classes were compared. A similar result was obtained by da Silva [12], who compared PAL of physical education students across various levels of study.

The result of this study shows that underweight and overweight exist in the study population, but none of the participant was obese. Most participants in this study had normal BMI (69.2% and 86.8% for first year and final year students), this concur with the findings Hakimeh,^[16] and Subramaniam and Mohammad^[17]. 24 of the first year students were overweight, accounting for 26.4% of the first year population and 90% of the total overweight individuals in this study. The proportion of students who were either overweight or obese in this study was lower compared to the study of Ameen and Fawole^[15] who studied the general undergraduate population in the same university. The significant difference observed in the prevalence of overweight between the first and final year students might be attributed to the fact that the first year students had in the previous year been waiting at home.

CONCLUSION

A high prevalence of physical inactivity was observed in the study population. This may imply that a high proportion of the study population have less physical activity than recommended by health authorities. Since lifestyle habit formed during college years impacts

on their future health and practice, it is important to find innovative means of encouraging healthcare trainees to maintain healthy body weight and increase physical activity level during college years if they are to be effective models in carrying out awareness and prevention strategies. There may be need for increased awareness on health implications of poor dietary choices and low calorie expenditure physical activities. This may inform the school authority on the need to provide counseling services on how to make healthy lifestyle choices while in college. Opportunities should also be provided to encourage students' participation in leisure time physical activities.

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