

Facility Related factors Affecting Academic Performance of Medical Student in Human Anatomy in Bahir Dar University, Northwest Ethiopia

Shibabaw Tedla Tiruneh (✉ shibabawtedila@gmail.com)

Bahir Dar University <https://orcid.org/0000-0003-0849-0772>

Belta Asnak Abegaz

Bahir Dar University

Abebe Ayalew Bekel

Bahir Dar University

Yibeltal Wubale Adamu

Bahir Dar University

Mengistu Desalegn Kiros

Bahir Dar University

Dawit Habte W/Eyessus

Bahir Dar University

Research note

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Abstract

Objective: The objective of this study was to identify college facility related factors affecting medical students' academic performance in human anatomy course. **Result:** A total of 120 study participants were included in the study. Of which 81 (67.5%) were male while 39 (32.5%) were females. Dormitory crowdedness (AOR 3.16 (95% CI: 2.01-8.33, $p = 0.011$), large class size (AOR = 2.36; 95%CI: 1.11- 4.64 $p = 0.005$), inadequate classroom facilities (AOR = 1.56; 95%CI: 1.51-4.91, $p = 0.001$), low internet access (AOR = 1.99; 95%CI: 1.07-3.22, $p = 0.015$) and inadequate anatomy teaching model (AOR = 2.63; 95%CI: 1.17 - 6.12, $p = 0.003$) were significantly associated with low performance in human anatomy course exam. However, college library (AOR = 0.23; 95%CI: 0.1-0.48 $p = 0.061$) did not show significant association with academic performance ($p = 0.61$). As a conclusion, dormitory crowdedness, large class size, inadequate classroom facilities, low internet access and inadequate anatomy-teaching models were independent factors, which affect performance of medical students in human anatomy course exam. However, there was no significant association between college library and performance of study participants in human anatomy course exam.

Introduction

Medical student's academic performance plays an important role in producing best quality graduates who will become great practitioners and work forces responsible for the country's health development. Academic achievement is one of the major factors considered by employers in hiring workers specifically for medical students. Thus, preclinical I medical students have to put greatest effort in their human anatomy course study to obtain good grades and to prepare themselves for future opportunity in their career at the same time to fulfill the countries health sector demand. Therefore, Human Anatomy course is the language of medicine and foundation of medical students in their clinical course performances and clinical practices. Investigation of factors related to the academic performance of medical students becomes a topic of growing interests in higher educational circle. Many recent studies were carried out to explore factors affecting medical students' academic performance. Research report showed that students' performance is affected by many factors. Among these factors, facility related factors such as classroom facilities and environment, internet access, overcrowding, dormitory environment, availability of library and reference books are identified. Classroom environment is a combination of physical characteristic of the room. These physical facilities of the classroom are one of the stimulating factors that play a fundamental role in improving academic performance of students in the school system [1]. For example a study done on more than 2,000 classroom in California, Washington and Colorado, students who were exposed to a larger amount of daylight, optimum temperature, and well ventilated classroom in their classroom had higher mathematics and reading test scores than students who were exposed to less daylight, high temperature and less ventilated classroom [2]. The Internet is a very useful medium for quick access to information, especially for students. In particular, social networking sites usage facilitates students in communication, socialization, coordination, collaboration and entertainment, but the use can also cause addiction and lead to time wasting, information overload and

physical isolation from society [3, 4, 5]. In our college, preclinical I medical students scored under in anatomy course for the last three years. This condition needs research. Thus, this study proposed to identify facility related factor affecting academic performance of preclinical I medical students in human anatomy course.

Method And Materials

Study design and period

Cross-sectional study design was carried out from December 2018 to February 2018 at College of Medicine and Health Sciences, Bahir Dar University, Northwest Ethiopia.

Study area and setting

This study was conducted at College of Medicine and Health sciences, Bahir Dar University, Northwest Ethiopia. This college is one of the five colleges found under Bahir Dar University. This college was started in 2007 by teaching 100 medical students. Now a day, the college is organized by 36 under graduate including medicine, six master, six specialization and one PhD programs and teach 3006 students. This college is found at Bahir Dar city administration. Bahir Dar city is the capital of Amhara National Regional State, Ethiopia. It is 570km away from the capital city of Ethiopia, Addis Ababa, in the Northwest direction and situated in the south of Lake Tana, the biggest lake in the country. The altitude ranges from 1799 m to 5902 ft above sea level and the coordinates are 11°35.6184' N latitude and 37°23.4462' E longitude.

Sample size and sampling procedure

One hundred twenty study participants were selected by using systematic random sampling method. In this study, outcome variable (letter grade) was scaled as high ($\geq 70\%$) and low ($< 70\%$) based on the standard of Ethiopian Higher Education Grading system.

Data collection

Self-administered structured questionnaires were used to collect socio-demographic character of participants and facility related factors after clear orientation about the purpose of the study.

Data Analysis

Data were entered and analyzed using Statistical Package for Social Sciences 22. Descriptive statistics was used to describe demographic characteristic of the participants. Bi-variable logistic regression was used to identify factors associated with academic performance. Multivariable logistic regression was used to assess the impact of independent variables on the outcome variables. Odds ratio was used to measure the strength of the association and p value ≤ 0.05 was considered statistically significant.

Result

One hundred twenty students were participated in the study. Among study participants, 12(10%) were age 20 years and below while 108 (90%) were above 20 years. In this study, 81 (67.5%) and 39 (32.5%) were male and female participants, respectively. Forty-two (35%) students were coming from rural areas while 78 (65%) students were from urban. Nineteen (15.83%), 28 (23.33%) and 73 (60.8%) students were from families who unable to read and write, able to read and write and complete primary school and above. Among 120 study participants 48(48.3%) were got B and above in their anatomy course while 62(51.7%) of students score below "B" (table 1).

In this study, those students who said there is crowdedness in the dormitory (AOR 3.16 (95% CI: 2.01-.83) were scored 3.16 times less grade than those who said no any crowdedness in the dormitory. Those students who said dormitory crowdedness affect their performances (AOR = 2.20; 95%CI: 0.95- 4.74) were more likely to have less score on human anatomy exam than those who said that dormitory crowdedness did not affect their grade performances. Large class size (AOR = 2.36; 95%CI: 1.11- 4.64) was independent factors that decrease students grade performance in human anatomy course. Similarly, study participants who said the class contain inadequate necessary facilities (AOR = 1.56; 95%CI: 1.51 – 4.91) were scored less in human anatomy exam than those participants who said that the class contain the necessary facilities. In this study, the presence of separate and well-furnished libraries for medical students (AOR = 0.23; 95%CI: 0.1, 0.48) was not independent factors that affect students grade performance in human anatomy course. Those students who said that there were not enough anatomy references in both quality and quantity (AOR = 1.26; 95%CI: 1.21, 4.76) were scored less in anatomy course exam than those who said there were enough anatomy reference books in both quantity and quality. Study participants who said there was low internet access for searching reference books (AOR = 1.99; 95%CI: 1.07, 3.22) were scored less grade than those who said there were internet access for searching reference books. In this study, those students participate in the study who said there were not enough and quality anatomy model in the laboratory room (AOR = 2.63; 95%CI: 1.17, 6.12) were scored less grade in anatomy course exam than those who said there were enough and quality models in anatomy laboratory (table 2).

Discussion

In this study those students who said there was dormitory crowdedness were score 3.16 time less grade than those who said there was not dormitory crowdedness ($p = 0.011$). This study agrees with study done in Ghana which described that study participants who said there was university students dormitory

crowdedness (more than 4 students in a single room) were scored 2.10 times less grade than those who said there was not dormitory crowdedness in their campus[6]. On the contrary, study done in India demonstrated that there was not any significant deference in academic performance between participants who said there was dormitory crowdedness and those who said there was not any dormitory crowdedness in their campus [7]. This deference may be due to small sample size included in the study or economical disparity and University standards between the two countries.

Class size is defined as the number of students in a single classroom. Smaller class size increase teacher-student interaction; make students to participate in classroom activities; foster greater interaction among students and helping them understand one another and increase their desire to assist one another [8]. But study done by Adeyela found out large class size was not conducive for serious academic work [9]. In our university, 100 preclinical students were attended anatomy course in a single class. Thus, Study participants who said there was large class size were about two times more likely to score less in anatomy course exam than those who said there was not large class size ($p = 0.005$). This study was consistence with research reports noted in USA which stated that students in smaller classes scored higher on standardized tests than did those in large classes, smaller classes had fewer behavioral problems and a teacher felt more productive in smaller classes [10]. However, study done in Nigeria demonstrated that no significant relationship among class size and students learning outcomes [8, 11, 12]. In this study, study participants who said classrooms seat, seat arrangement, color of classroom, light, temperature, ventilation, acoustics, site and number of window were not comfortable or inadequate for learning were about one times lower odds of scoring in anatomy course exam than those participants who said the classroom contained the necessary facilities ($p = 0.001$). This study was in contrast with findings from previous study where they found classroom environment and physical conditions had insignificant influence on academic performance of students [13]. However, study done in Pakistan demonstrated that students attended their class in well equipped class room with physical facilities had a significant positive effect on the academic performance of students than those who attended their class in unequipped class room [1].

Libraries are essential for generating and seeking knowledge, provide place students and faculty members to do research and advanced their knowledge; has roles to collect, process, store, disseminate and utilize information [14]. In our university, there is one separate medical library for both medical and other health science students with limited reference books. In this study, there was no significant difference between participants who said there was no well-equipped library with anatomy reference books and those who said there was well-equipped library with anatomy reference books ($p = 0.061$). However, research findings showed that those study participants who said there was well-furnished library with adequate reference were got higher grade than those participants who said there was no any easy accessible library [14]. This may be due to variations in utilization of limited library service between the two populations in this study.

Internet is an essential part of our society, which provides easy access to social, political economical and academic information's across the world without leaving their place of residence. However, there are

drawbacks such as impaired academic performance, health problems, personal relationship problems and social dysfunctions when it is used in a wrong and uncontrolled way [15]. In our university, the problems of internet service are limited access, low speed, frequent disruption, low maintenance and low coverage. Thus, students have no access to internet when they need for academic work activities. This study results showed that participants who said there was no internet connection to access books and references were about one times more likely to score less grade than those who said there was an internet connection to access books and references. Similar studies done in Uhanda showed that study participants who said there was internet connection access without limitation were score high grade than those who had no access for internet [16]. Another study done in Ecuador demonstrated that those students who accessed and used internet for academic coursework scored higher as compared to students who did not accessed internet connection [17, 18].

Human teaching models are important tools to teach anatomy course for medical students. This study findings demonstrated that those students participate in the study who said there was no appropriate teaching model were scored 2.63 times less grade than those who said there was enough and appropriate models ($p = 0.003$).

Conclusions

Dormitory crowdedness, large class size, classroom facilities, internet access and anatomy teaching models are independent risk factors for low academic performance in human anatomy course exam. However, there was no significant association between college library with academic performance of preclinical I students.

Limitations

- Data was taken from small sample. As a result, generalization was compromised.
- Second, data was extracted from single batch of students
- Finally, this study focus only facility related factors.

Declarations

Author contribution

ST conceived the idea, participated in the data collection, data analysis and drafted the manuscript. BA, AA, YW, MD and DH participated in the data collection, data analysis, reviewed and approved the manuscript. All authors read and approved the final manuscript for publication.

Author Details

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Competing Interests

The authors declare that they have no competing interests

Availability of data and materials

The data and materials used in this study are available from the corresponding author on reasonable request

Consent for publication

Written informed consent was obtained from study participants for publication of this paper.

Ethics approval and consent to participate

This study was approved by College of Medicine and Health Sciences Research Review committee. Written informed consent was taken from each study participants before administration of questionnaires and data collection. In addition, support letter was obtained from biomedical department. Personal identifiers were not used. Data were retrieved for only study purpose to insure confidentiality. The results of this study have been submitted to College of Medicine and Health Sciences Academic Director Office and biomedical department and recommended them to fulfill college facilities important for learning.

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Tables

Tables

Table 1: Analysis of demographic characteristics of study subjects

Parameters		Frequency	Percent (%)
Age	= < 20 years	12	10
	> 20 years	108	90
Sex	Male	81	67.5
	Female	39	32.5
Address	Rural	42	35
	Urban	78	65
Family educational status	Unable to read and read	19	15.8
	Able to read and write	28	23.3
	Primary school and above	73	60.8
Preclinical one student		48	40
Clinical one students		72	60
Grade performance	Get "B" and above	58	48.5
	Get below "B"	62	51.7

Table 2: Analysis of facility related factors affecting academic performance of premedical I and clinical one medical students in Anatomy

Variables		Grade performance		COR (95%CI)	P value	AOR (95% CI)	P value
		High	Low				
Is there any Crowdedness in the dormitory	Yes	49	48	3.52(1.2-10.25)	0.021	3.16(2.01-.83)	0.011
	No	18	5	1		1	
Is there dormitory crowdness affect your performance	yes	33	44	2.25(1.04-4.83)	0.038	2.20(0.95-4.74)	0.021
	No	27	16	1			
Was the class size comfortable for teaching learning?	Yes	22	35	2.41(1.16-5.05)	0.018	2.36(1.11-4.64)	0.005
	No	38	25	1		1	
Did the classes have the necessary facilities?	Yes	51	3	1		1	
	No	7	49	2.65(1.20-5.81)	0.015	1.56(1.51-4.91)	0.001
Was there library with anatomy reference books in both quality and quantity?	Yes	38	27	1		1	
	No	20	35	0.41(0.19-0.85)	0.017	0.23(0.1-0.48)	0.061
Did you get internet connection to access books/references?	Yes	46	31	1		1	
	No	16	26	2.41(1.12-5.21)	0.025	1.99(1.07-3.22)	0.015
Were there appropriate models for Anatomy	Yes	24	10	1		1	
	No	38	48	3.03(1.29-7.11)	0.011	2.63(1.17-6.12)	0.003