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A study to assess factors affecting the performance of undergraduate medical students in academic examination in community medicine

Venkatashiva Reddy B., Arti Gupta, Amit Kumar Singh*

Department of Community Medicine, Veer Chandra Singh Garhwali Government Medical Sciences and Research Institute, Uttarakhand, India

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*Correspondence: Dr. Amit Kumar Singh,

E-mail: hodpsmvcsg@rediffmail.com

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ABSTRACT

Background: Undergraduate medical education is facing many basic problems in India today. This study aimed to identify and analyze factors that affect the students' academic performance in Community Medicine.

Methods: A cross sectional study was conducted at the Department of Community Medicine, VCSGGMS & RI, Uttarakhand, India among the third and sixth semester medical students from February to July 2016. The questionnaire was used to interview 182 students. The questionnaire covered demographic factors, physical fitness in terms of refractive error, use of technology in the form of smart phones and internet, stress level in the form of sleeping hours before examination, pattern of meals before examination and material used for study and others. The student was scaled based on an achievement marks percentile.

Results: The research population included 182 students (85 male and 97 female). The mean age of the studied students was 21.62 ± 1.61 years. About 48.9% of the students were using spectacles. Over 90% of the students reported using smart phones, computer, and access to the internet. The mean hours of sleep day before the examination were 5.14 ± 1.94 hours. About three fourth of the students, reported consuming meals before the examination. Demographic factors, i.e. age and gender were significantly associated with students' overall academic achievement in multiple linear regression analysis (p<0.05).

Conclusions: Various factors determine the academic performance of students. To understand better about the factors that contribute in the academic performance of students there is need for a qualitative study.

Keywords: Student, Examination, Medical, Performance, Achievement, Grades

INTRODUCTION

In the present century of globalization, students are the crucial element of any nation. The students' performance plays a vital role in the development of quality graduates. This enhances the economic growth of a country. Academic achievement is considered as a first step for hiring fresh graduates. Thus, it is linked with students to increase their productivity and quality of life.¹

The primary aim of undergraduate medical education is to generate competent doctors.² Undergraduate medical

education is facing many basic problems in India today. In spite of the presence of the best teachers in medical universities, yet not many physicians possess the quality of knowledge and skills.³ Examination is an integral part in any area of academic program, to measure a student's progress towards predetermined objectives. There are factors, which create obstacles to the real performance of the student.⁴

These variables that affect students' quality of academic achievement includes academic burden, parental and peer pressure and psychological factors. Known factors affecting the performance of the students in academics

are physical fitness, age, sex, technology, stress, and sleeping hours. 5,6 Studying the quality of the factors affecting students' academic performance can help provide important information to improve educational programs. 7

Few studies have described the factors that affect student success in undergraduate medical education. Besides other factors, student's perception and preferences among different medical specialties contribute towards the academic performance of students.⁷ The medical curriculum comprises three stages: pre-clinical, para clinical and clinical. Majority students are usually obsessed with clinical background subjects.⁸ On the contrary, at undergraduate level; in community medicine we teach primarily working with the community and primary care settings.⁹ This may have a negative effect on the academic performance of students in community medicine because the basic interest and motives of students remain unfulfilled.⁹ This study aimed to identify

and analyze factors that affect the students' academic performance in Community Medicine.

METHODS

A cross sectional study was conducted at the Department of Community Medicine, Veer Chandra Singh Garhwali Government Medical Sciences and Research Institute, Uttarakhand, India among the third and sixth semester medical students from February to July 2016. The questionnaire was administered to 213 of the third and sixth semester regular and supplementary batch medical students. The students were selected based on their presence in the lecture. A copy of the questionnaire, which assessed demographics and factors affecting students' academic performance, was given to all of the selected students by the study team. The students were asked to return the completed questionnaires if consented in participating in the study, to the study team. Of the 213 questionnaires, 182 (85.5%) were returned.

Table 1: Description of study sample (n =182).

Variables	Characteristics	Sample statistics
Demographic factors		
A co (in vocas)	Min-Max	19-29
Age (in years)	Mean ± SD	21.62(1.61)
Gender	Male: n(%)	85(46.7)
Gender	Female: n(%)	97(53.3)
Biological factors		
Dominant hand	Right: n(%)	178(97.8)
Dominant nand	Left: n(%)	4(2.2)
Lice of apostoples	Yes: n(%)	89(48.9)
Use of spectacles	No: n(%)	93(51.1)
Technology factors		
Use Smart Phone	Yes: n(%)	168(92.3)
Use Smart Fhone	No: n(%)	14(7.7)
A cooss to commutan/lenten	Yes: n(%)	164(90.1)
Access to computer/laptop	No: n(%)	18(9.9)
Use computer/laptop	Personal: n(%)	81(44.5)
Ose computer/taptop	Shared: n(%)	101(55.5)
Access to internet	Yes: n(%)	178(97.8)
Access to internet	No: n(%)	4(2.2)
Use internet	Personal: n(%)	23(12.6)
Ose internet	Shared: n(%)	159(87.4)
Personal factors		
Communication and Indian the comming tion	Yes: n(%)	141(77.5)
Consumption meals before the examination	No: n(%)	41(22.5)
TT	Min-Max	0-10
Hours of sleep day before the examination	Mean ± SD	5.14(1.94)
	Lecture notes:n(%)	98(53.8)
Material was used for preparation of examination*	Books: n(%)	177(97.3)
	Internet: n(%)	25(13.7)

^{*}multiple answer

Table 2: Extent of factors that affect academic performance of respondents.

Variable	Category	percentile (percentile of students according to marks n(%)			- Statistics	P
		76-100	51-75	26-50	≤25	Statistics	value
Demographic factor	s						
Age (in years) (Mean	± SD)	21.3(1.15)	21.24(1.34)	21.53(1.24)	22.37(2.25)	5.02*	.002
Gender	Male	15(17.6)	16(18.8)	20(23.5)	34(40.0)	19.63**	< 0.001
	Female	30(30.9)	30(30.9)	25(25.8)	12(12.4)	19.05	
Biological factors							
Dominant hand	Right	45(25.3)	46(25.8)	42(23.6)	45(25.3)	6.23***	0.101
Dominant nand	Left	0(0)	0(0)	3(75)	1(25)	0.23	0.101
Use of spectacles	Present	25(28.1)	23(25.8)	26(29.2)	15(16.9)	7.125**	0.068
Ose of speciacies	Absent	20(21.5)	23(24.7)	19(20.4)	31(33.3)	7.123	
Technology factors							
Use Smart Phone	Present	42(25)	41(24.4)	45(26.8)	40(23.8)	6.32***	0.097
Use Smart Phone	Absent	3(21.4)	5(35.7)	0(0)	6(42.9)	0.52****	
Access to computer/ laptop	Present	42(25.6)	44(26.8)	41(25.0)	37(22.6)		0.072
	Absent	3(16.7)	2(11.1)	4(22.2)	9(50.0)	6.99***	
Use computer/ laptop	Personal	18(22.2)	23(28.4)	19(23.5)	21(25.9)	1.05**	0.789
	Shared	27(26.7)	23(22.8)	26(25.7)	25(24.8)	1.05	
	Present	44(24.7)	45(25.3)	43(24.2)	46(25.8)	2.00***	0.554
Access to internet	Absent	1(25)	1(25)	2(50)	0(0)	2.09***	
Use internet	Personal	4(17.4)	5(21.7)	5(21.7)	9(39.1)	2.79***	0.424
	Shared	41(25.8)	41(25.8)	40(25.2)	37(23.3)		
Personal factors							
Consumption meals before the examination	Present	36(25.5)	36(25.5)	34(24.1)	35(24.8)		0.95
	Absent	9(22.0)	10(24.4)	11(26.8)	11(26.8)	0.326**	
Hours of sleep day be examination (mean±		4.92(2.01)	4.87(1.82)	5.31(1.82)	5.45(2.12)	0.98*	0.403
Total		45(24.7)	46(25.3)	45(24.7)	46(25.3)		

^{*}F Statistics ** Chi Square *** Fischer Exact.

The questionnaire covered demographics and factors affecting students' academic performance. Likely factors were selected on the basis of review of literature and discussions. Demographic factors included the student's age, and gender. Factors affecting students' academic performance included physical fitness in terms of refractive error, Use of technology in the form of smart phones and internet, Stress level in form of sleeping hours before examination, pattern of meals before examination and material used for study and others. These were broadly divided in three groups, biological, technological and personal factors. The quality of academic performance of students in community medicine was measured by their achievement marks of the end semester examination retrieved from the department records after obtaining all necessary permissions from the department. The student was scaled in poor, average, good and excellent based on an achievement marks percentile.

Ethical clearance was obtained from the Veer Chandra Singh Garhwali Government Medical Sciences and Research Institute, Uttarakhand, India. Analyses of the data were completed using SPSS version 17.0 (SPSS Inc., Chicago, IL, USA). The differences in proportions were analyzed using Chi square and Fischer exact test. The differences in means were analyzed using the independent sample t test. A P value of less than 0.05 was considered statistically significant. The final multivariate linear regression model was built with demographics and factors affecting students' academic performance.

RESULTS

The research population included 182 students (85 male and 97 female). The mean (\pm SD) age of the studied students was 21.62 ± 1.61 years. Only four students were left hand dominant. About half (48.9%) of the students was using spectacles. A total of 168 (92.3%) students reported using smart phones, 164(90.1%) students had access to a computer, and 81(44.5%) of them had personal computer or laptop. Of total 178(97.8%) students had access to the internet, and 23 (12.6%) of them had a personal internet connection. The mean hours of sleep day before the examination were 5.14 ± 1.94 hours. About three fourth (77.5%) of the students, reported consuming meals before the examination as shown in Table 1.

Males had lower percentiles than females in the examination with P value <0.001. Age had a significant effect on students' overall academic achievement at the 0.05 level of significance. That was no significant difference in percentile of students by the use of smart

phone, computer/laptops, and internet. Higher percentile was found among the students who reported consumed meals before the examination and with lesser hours of sleep a day before the examination as shown in Table 2.

Table 3: Results of hierarchical stepwise multiple linear regression analyses.

Analysis Block	Adjusted R-square	Independent Variable	В	95%CI of B		β	P				
			Unstandardized Coefficients	Lower Bound	Upper Bound	Standardized Coefficients	value				
Dependant varia	Dependant variable= percentile of students in examination										
Block 1											
Demographic	aphic 0.115	Age	0.103	.001	.206	.148	0.049				
factors	0.113	Gender	-0.557	917	197	249	0.003				
Block 2											
Biological	0.124	Dominant Hand	-0.847	-1.91	0.224	-0.111	0.120				
factors		Use of Spectacles	0.232	089	0.552	0.104	0.155				
Block 3											
Technology factors	0.124	Use Smart Phone	-0.013	623	0.596	-0.003	0.966				
		Access to computer/ laptop	0.476	087	1.040	0.127	0.097				
		Use computer/laptop	0.111	249	0.470	0.049	0.544				
		Access to internet	-0.204	-1.33	0.923	-0.027	0.722				
		Use internet	-0.352	862	0.159	-0.104	0.176				
Block 4											
Personal choice factors	0.12	Consumption meals before the examination	0.207	180	0.594	0.077	0.292				
		Hours of sleep one day before the examination	0.022	065	0.109	0.038	0.620				

In the hierarchical stepwise multiple linear regression analysis, Demographic factors (Block 1, table 3) explained 11.5% of the variance on students' overall academic achievement when none of the other factors were controlled for. Biological, technology and personal choice variables (Block 2,3,4 table 3) explained an additional nearly 1% of the variance on students' overall academic achievement. Altogether, the final model explained 12% of the variance in students' overall academic achievement as shown in Table 3. Demographic factors, i.e. age and gender were significantly associated with students' overall academic achievement in multiple linear regression analysis.

DISCUSSION

Discovering methods to improve students' knowledge and skill is a challenge. The present study identified factors that affect the students' academic performance in Community Medicine. Females constituted more than half of the total sample in the present study. Similarly the female predominance was found among undergraduate dental students in Egypt. Statistically significant differences existed between female and male students in

academic performance. On contrary, a study stated female student academic performance in biostatistics course was the same as that of the male students. ¹¹ The primary reason for this difference could the difference of study subject. Statistically significant association was observed between achievement marks and age of the student. As the age progress, the percentile marks achieved tends to fall. Comparably a study found that age predicted performance of students in a psychology statistics course. ¹²

The presence of refractive error in the student did not affect percentile academic scores. Similar were the finding from another study from Alabama, a southeastern U.S. State and China The easy availability of smart phones and computers had brought unprecedented learning opportunities to students. ^{13,14} However, the manner internet is used by the students is a major concern. ^{15,16} Though the students in having higher percentile reported the use of smart phone and computers and access to internet, nevertheless no significant association was found between the student's academic performance and these technological factors. Comparably, a study conducted in northern Taiwan

among 8th grade students documented that online search for subject helps to improve the scores, while social media, contributes to poorer student's examination performance.¹⁷

In the present study, consumption of meals before the examination and less hours of sleep a day before the examination was associated with higher percentile in academic examination. By contrast, a study conducted among fifth grade students found sleeping more than 9 hours/night was associated with better grades. ¹⁸ This difference could be due to the difference in course standards. A study carried out in Malaysia, among 9-10 years old primary school children documented academic performance was significantly correlated with consuming breakfast. ¹⁹ Similar were the results of other studies on behavior and academic performance. ^{20,21} The major limitation of the study is only academic performance in Community Medicine is assessed. Therefore, it cannot be generalized to the entire MBBS course.

CONCLUSION

Various factors determine the academic performance of students. The present study only focused on some of those factors. To understand better about the factors that contribute in the academic performance of students there is need for a qualitative study.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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