Original article

Do studying resources impact academic grades of medical students? A study from a private institute in Karachi, Pakistan

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ABSTRACT

Background: Medical education has undergone drastic changes by including new teaching methodologies with the inclusion of online reading portals along with textbooks. This study aimed to assess the studying resources opted by undergraduate medical students and the impact on their academic grades.

Subjects and methods: This cross sectional survey was conducted at Liaquat National Hospital and Medical College, Karachi, Pakistan from April to July, 2018. A total of 299 undergraduate medical students were recruited through purposive sampling technique. A self-administered structured questionnaire was developed for data collection. The grades obtained by the students during recent module exams were utilized for this study. These grades were then correlated with independent factors like studying resources opted by the students. SPSS version 22 was used for data entry and analysis.

Results: The students used textbooks and the internet for their studies, instead of one resource alone. YouTube was the most commonly accessed website. There were significant associations between the combined use of textbooks as well as internet and higher academic grades. Females and junior students were also significant predictors of better exam grades, although there was no difference in their studying resources.

Conclusion: The study highlighted the importance of the combined use of textbooks and internet as most useful in the attainment of better exam grades in medical education. Further experimental studies are required in order to study in detail regarding the various other factors impacting the grades of a student, apart from reading resources.

Keywords:

Medical Education, Academic Grades, Studying Resources

INTRODUCTION

The medical education system has undergone massive changes in the past few years in several countries.[1] Information and Communication Technology (ICT) has transformed almost every aspect of human life and education is not an exception. Compared to the traditional textbook, the internet has the power to make information processing and management quicker, more resourceful, extensive and interactive.[2] The visual impact of educational sessions is long lasting and students tend to recall better when they study from visual sources. Multiple studies have been published and the data suggest that students learn considerably more from a blend of both words and images (in the form of technology) compared to learning from mere words or textbooks.[3]

Online teaching resources and methods are still in their early stages in developing countries, where very few studies have been conducted on the academic impacts of reading through textbooks compared to studying through internet resources. A study from South Korea showed that the students who read through textbooks had a higher score in comprehension compared to those who studied only through online resources.[4] Apart from the studying resource, research suggests a number of other factors, interplay of which, have an impact on the academic grades of a student. These include but are not limited to; the number of hours a student devotes exclusively to study[5], free internet access and the years since internet use [6] and the gender of the student.[7] Such factors impacting academic performance of students have not been researched in developing countries like Pakistan. Therefore the current study aimed to assess the impact of different resources for studies on the academic performance of undergraduate students studying for Bachelors of Medicine and Bachelor of Surgery (MBBS).

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SUBJECTS AND METHODS

This cross-sectional survey was conducted at Liaquat National Hospital and Medical College, Karachi, Pakistan from April to July, 2018. The study participants were recruited through purposive sampling technique. Liaquat National Hospital and Medical College is a private institute, where students are provided with training in medicine and surgery through academics as well as patient management at the hospital side. The curriculum from 1st to 4th professional year MBBS comprises of 8 semesters and various modules within the semesters. The first two years of medical education is entirely classroom based, where the students go through a series of lectures and tutorials. In the third year onwards, students are expected to bring the knowledge into clinical practice, where they rotate into various clinical specialties like Medicine, Gynaecology and Surgery. The 5th year of MBBS is entirely reserved for the application of theory in clinical skills and patient care.

Ethical approval prior to start of this study was obtained from the Ethical Review Board of Liaquat National Hospital. The students were informed about the study and invited to participate in it. Written informed consent was obtained from those willing to participate. They were also informed prior to recruitment that they would be required to provide their class roll numbers so that their grades could be assessed later.

A questionnaire for the study was developed by using questions derived from various studies published online on the subject similar to this research. Public Health experts were contacted to review the final version of the questionnaire, in order to assess the validity of the questions. Each question was pre-tested by administering the questionnaire on students who were not part of the study. The changes suggested by the reviewers were then incorporated in the final version of the questionnaire (available as supplementary file at www.JFJMU.com).

Data was collected from a total of 299 undergraduate MBBS students (1st year to 4th year). The questionnaires were distributed at the end of the lectures, while the students were in their classrooms. As the students completed and handed over the questionnaire, it was assessed for completion. At the end of survey, incompletely filled questionnaires were excluded from the study. Further, students unwilling to share their information were also excluded from the study. The grades obtained by the students in recent module exams were utilized. The grades included the total marks obtained by each student, including those of Objectively Structured Practical Examination (OSPE) as well as theory. The marks were out of the grand total, i.e. 260 marks (100 for theory and 160 for OSPE). These grades were then correlated with independent factors like studying resources opted by the students.

Subsequent to data collection, data forms were edited and coded. The data were entered and analyzed using the software Statistical Package for the Social Sciences (IBM SPSS Statistics version 22). Descriptive statistics of demographic variables of the students along with the study-related variables were computed as frequency with percentages and mean with standard deviation, for continuous variables such as age of the students. All variables with p-value <0.25 and all biologically plausible variables were included in the multivariable model through Enter method. Variables with a p-value <0.05 were considered significant.

RESULTS

The mean age of the students was 20.5 years. There were 87 males (29.1%) and 212 female students (70.9%). Majority (81.6%) of the students were day scholars. Regarding study resources, none of the students used textbooks alone for studies. Around 93.6% of students used textbooks as well as internet sources for regular study purposes and only 5% of students informed that they use internet only on regular basis for study purposes. When asked about the attention span of the students while studying through either resource (textbooks *vs.* internet) during exams, 29% of the students reading through textbooks were able to maintain their attention for 1-2 hours, while 30.4% of students were able to maintain their attention for 0.5-1 hour while studying through internet sources. Table 1 shows the demographics and study-related characteristics of medical students.

Majority of the students had been using the internet for 5-10 years (43.1%) and most of the students had access to the internet at their homes (75.6%). Smartphone was the most commonly (77.3%) used device by the students. They accessed YouTube most commonly (35.5%), followed by PowerPoint presentations (34.1%), Wikipedia (16.1%) and Google Scholar (7.7%). Figure 1 shows the websites most commonly used by the Medical students. Most of the students (57.20%) stated staying in touch with friends through emails or social media, while 22.40% students spent their time watching online soaps or movies. Figure 2 reflects the other purposes for which the students use the internet while they are studying.

Table 1. Demographic and study related characteristics of medical students in Karachi (n = 299)

Characteristics	Frequency n (%)
Age (years [Mean (SD])	20.48 (1.33)
Gender	
Male	87 (29.1)
Female	212 (70.9)
Place of residence	
Home	244 (81.6)
Hostel	55 (18.4)
Students' preferred resource for regular study purposes	
Textbook and internet	280 (93.6)
Internet only	19 (6.4)
Longest attention span while studying for exam	
1-2 hours while using textbook	87 (28.7)
0.5-1 hour while using internet	93 (30.4)
Years since using internet	
<1 year	21 (7.0)
1-5 years	85 (28.4)
5-10 years	129 (43.1)
>10 years	64 (21.4)
Place of internet access	
College computer lab	17 (5.7)
College hostel	44 (14.7)
At home	226 (75.6)
Everywhere	12 (4.0)
Device most commonly used	
Laptop	64 (21.4)
Desktop	4 (1.3)
Smartphone	231 (77.3)

On univariate linear regression analysis, strong associations between student academic grades and use of internet as well as textbook as a studying resource, female gender, years of education and students living at home were observed. In the multivariate analysis, the students who used internet and textbooks as studying resource had 14.2 points higher scores than those who used only internet, indicating a positive impact of the combined use of internet and textbook as resources on examination grades of the students. Apart from this, gender and years of education remained significant predictors of academic grades; however the place of residence showed no significant association. We also assessed possible difference in preferences for studying resources with regards to gender and years of education of the students. However, there were no significant differences observed between male and female students or junior and senior students with regards to preference for studying resources. Table 2 shows the univariate and multivariate association of examination grades with use of studying resource and other independent variables like gender, years of education and place of residence of students

DISCUSSION

We quantitatively assessed the associations of grades of students with their studying resources. The findings of this study suggest that the students who used textbooks as well as internet as studying resource were better scorers in exams compared to the students who accessed only internet. A global study from the Organization for Economic Co-operation and Development (OECD) shared its recent report stating that the institutes where there is heavy investment in computers and classroom technology, the performance of students was not much improved as anticipated.[8] The report also suggested that despite the excessive infiltration of internet and communication technology (ICT) in our lives, formal education system has not yet been able to benefit from them. Despite availability of numerous learning tools, textbooks continue to be a dominant resource for students and faculty.[9] Internet use alone cannot improve the performance of a student, owing to the fact that there are chances that the student may get indulged into sites other than those strictly meant for exams and studies. Similarly, in this study most of the students used social media, during their studies. Social media has gained popularity, but could also result in distraction of a student's attention while studying, which is considered to be one of the greatest drawbacks of social media.[10] A good number of students used social media (57%) and watched online soaps (22.4%) while studying. These websites have often become a source of addiction especially among young adults.

Table 2. Association of students' academic grades with studying resources

Variable	Univariate		Multivariate	
	B (95% CI)	p-value	B (95% CI)	p-value
Studying resource				
Internet only	1		1	
Textbook and internet	16.40 (1.5 –31.3)	0.032	14.2 (1.2 –27.3)	0.033
Gender				
Male	1		1	
Female	21.73 (14.0 – 29.4)	<0.001	20.8 (13.8 – 27.9)	<0.001
Years of education	-11.67 (-14.7 – -8.6)	<0.001	-11.43 (-14.5 – -8.4)	<0.001
Place of residence				
Hostel	1			
Home	11.03 (1.6 – 20.4)	0.021	-1.18 (-9.8 – 7.5)	0.789

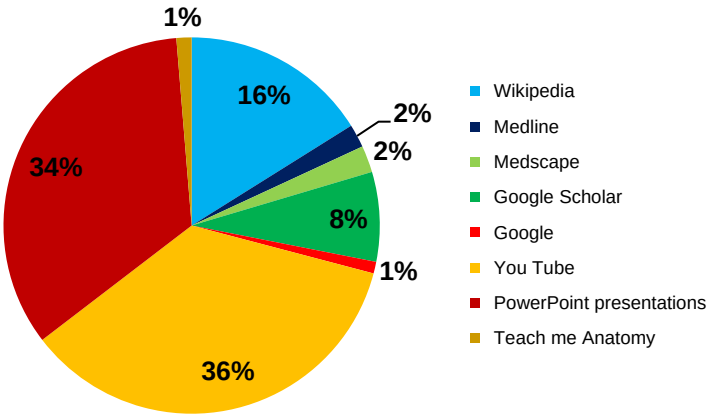

Figure 1. Frequency of websites and internet sources most commonly used by medical students for study purposes, Karachi, Pakistan (*n* = 299)

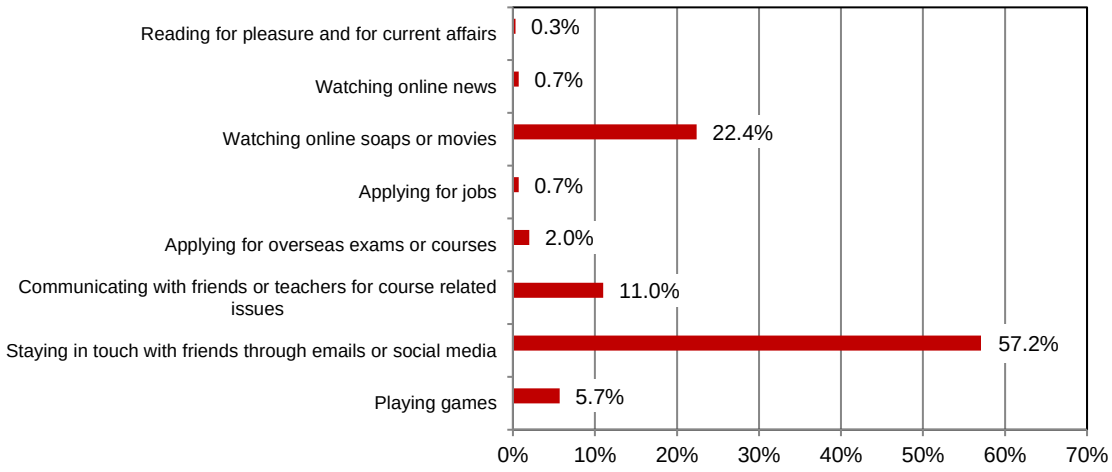

Figure 2. Purpose of using internet by students during studies, Karachi, Pakistan (*n* = 299)

Results indicate that female students obtained higher academic grades. Similarly previous studies showed that females were better in some learning aspects compared to their male counterparts.[11] Senior students had poorer grades compared to students in the earlier years of medical education in this study. This may be attributed to the fact that in the initial 2 years, students only have to focus on their academics, and later on, they are exposed to the task of clinical rotations in the hospital side, due to which they do not have enough time to focus on their course work, given the long hours of clinical attachments. However, when the data were analyzed, no differences were noted in the preference of studying resources among the males and females despite the gender-wise differences in their academic grades.

This study is among few studies in Pakistan which quantitatively assessed the association between studying methods and academic grades. Limitations of this study included respondent bias as the students were aware that their grades would be assessed, which may have prompted them to provide answers to potential questions that might not be true, such as studying resources. Although the students were assured that their information would be kept confidential, but still there is a possibility that many students may have shared partial information. Also since we assessed the grades of only the recent exam modules, there could be a possibility that the students did not perform to their optimum, due to any reason not captured in the study. Their previous grades may have been better or even worse than the ones used in this research. A better approach was to use the annual grades of these students, but currently the students have a semester system of education, where they have an assessment of every subject, hence it was

not possible to get the accumulated grades of the students.

CONCLUSION

The current study highlights the importance of the combined use of textbooks and internet in the achievement of good examination grades. The active learning of medical students needs to be focused by the administration, educational policy makers and families, so that there is maximum benefit to the medical students, who would be responsible for the lives of millions of patients in the future.

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