Research Article

Study skills and strategies of the medical students among medical colleges in Mysore district, Karnataka, India

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ABSTRACT

Background: Study skills are discrete techniques that can be learned, usually in a short time, and applied to all or most fields of study. The approach students choose appears to be a central factor in determining both the quality and quantity of their learning. Learning styles influence the maintenance of information and the depth of understanding.

Methods: A prospective interventional study was conducted among the medical students of phase-II, phase-III part-I and part II studying in government and private medical colleges. The data regarding socio-demographic characteristics like age, sex, religion, total family income, locality, phase of MBBS Course, state in India from which the student came and the learning skills were collected on a self-administered pre tested structured questionnaire, which will also include Study Skills Inventory tool. Paired t test for academic performance before and after intervention, Mann Whitney test for difference in mean ranks in study skill scores between Government and private colleges, spearman correlation for academic skills and study skill scores were applied.

Results: The note-taking skills, memory skills and time management skills of private medical college students and their academic performance were correlated significantly. There was a significant improvement in the academic performance of private medical college students by 3.01 and government medical college students by 3.69 after the intervention.

Conclusions: There was a significant improvement in the academic performance of both private and government medical college students after the intervention.

Keywords: Memory, Study skills, Medical College, Students, Concentration

INTRODUCTION

Study skills or study strategies are approaches applied to learning. They are generally critical to success in school, considered essential for acquiring good grades, and useful for learning throughout one's life.¹ Respicus Rwehumbiza in his book "Understanding Examination Techniques and Effective study Strategies" in 2013 asserted that, most students fail in examinations simply because they lack study skills and/or examination taking techniques. There are arrays of study skills, which may tackle the process of organizing and taking in new

information, retaining information, or dealing with assessments.

They include mnemonics, which aid the retention of lists of information, effective reading, and concentration techniques, as well as efficient note taking.^{2,3} More broadly, any skill which boosts a person's ability to study and pass exams can be termed a study skill, and this could include time management and motivational techniques. Study skills are discrete techniques that can be learned, usually in a short time, and applied to all or most fields of study.

Substantive research continuously provides constant evidence that individual differences in how students approach learning exist. These differences in turn have a powerful influence on many aspects of learning and teaching every day. One of the most widely used frameworks for understanding student learning in higher education, from a student learning perspective, is the approaches to learning paradigm.⁴⁻⁷

Approaches to learning may be regarded as a description of acquired intentions, motives and strategies, which are partly determined by the learning context in terms of the students' responses to situational demands.⁸ They have a relational nature and can vary according to learning context.⁹⁻¹¹ Hence, the purpose of this research is to compare the study skills and strategies of the medical students among medical colleges in South India.

METHODS

A Prospective interventional study was conducted among the medical students of phase-II, phase-III part-I and part II studying in two medical colleges (one government + one private) situated in Mysore, Karnataka. All the students studying in the above mentioned phases, which were present on the day of data collection and gave consent included in the study (universal sampling). Students having exams beyond the study period were excluded from the study.

The data regarding socio-demographic characteristics like age (in completed years), sex, religion, total family income, locality (hailing from urban or rural area), phase of MBBS Course, state in India from which the student came and the learning skills were collected on a self-administered pre tested structured questionnaire, which will also include study skills inventory tool.

Ethical clearance for the study was obtained from Institutional ethics committee of the JSS Medical College, Mysore. Written informed consent was obtained from the participant for the questionnaire based Study Skills Inventory tool.

Study skill inventory tool

This questionnaire included general information about the student including their year of study and the Dennis Congo Study Skills Inventory (DCSSI).⁴ The DCSSI is a validated study skills inventory questionnaire. It consists of six domains, namely textbook reading, note taking, memory, test preparation, concentration and time management.

Each of these six domains had 5 to 13 components which were assessed using sentences to compositely indicate each component on a five point rating scale. Academic performance was assessed by collecting the information on percentage of marks secured in previous university examination in college office.

Mode of intervention for improving study skills

After collecting this information, intervention on study skills were given to the students by the faculty of Medical College, two times with minimum gap of a fortnight between two sessions.

The intervention was basically with power point presentation and group discussion with the students. Special training sessions were also held for poor performers. The components were,

Textbook reading

The formulation of questions from a chapter before they begin to study, surveying the headings, bold print, italics, questions, etc. looking for main idea and should be able to readily identify clarifying details under each main idea. Textbook reading system such as SQ3R (survey, question, read, recite, review) is an excellent strategy for building comprehension with expository text which improves the reading comprehension and boost content area achievement.

This technique is especially useful when reading textbooks and articles which provide students with a study formula to capture and direct their attention while reading that can easily be transferred to test taking.

Survey

It activates prior knowledge about the topic like titles, subtitles, headings.

Question

It will help students to focus on significant points and monitor their reading. Students generate questions about the topic before they read by turning headings and subheadings into questions. Read: As students read, they relate the selection to what they already know.

Recite

They answer the questions to test what they remember and understand by- Self-talk, class discussions, outlining, note-taking, underlining/ highlighting answers in the text, writing the correct answers below the questions. Review: Students will go back over the reading to build retention for a longer period of time.

Note-taking

Taking notes once they read textbook assignments and in lectures. After taking notes, they review them before going on to something else and rewrite the lecture notes. They compare notes with one or more classmates to check completeness and accuracy.

Memory

Reviewing the notes more than once or twice for exams and quizzes and using mnemonics, visuals in notes such as sketches, mind maps, diagrams, charts, etc. Organizing the details to main ideas into numbered or lettered lists. Converting the text and lecture material into their own words and thinking about the material that could be in exams and quizzes in an logical and meaningful order.

Test preparation

Studying with a classmate or group, if they don't understand something gets help from classmates, tutors, instructors etc. They will do all homework assignments in time and can easily identify what they have learned and what they have not yet learned before taking a test. Before going to the class they will review the notes and assigned material to them. Should eat well balanced meals daily and exercise regularly.

Concentration

Studying in a quite area when trying to learn and remember something and taking a short break after lengthy studying. They should avoid cramming (mugging). All the study equipment should be handy to the study place (pens, paper, calculator, etc.). The larger tasks are broken into smaller segments in order to complete a large assignment. When the subject matter is not naturally interesting, find a ways to learn it anyway. Studying in early morning and avoid studying in the evenings as much as possible.

Time management

Using a calendar book for recording daily and weekly upcoming academic and personal activities and lists such as daily "to do" lists, priority lists, assignment lists, etc. to organize academic and personal activities. They should set up a master schedule of fixed monthly activities such as work, club meetings, etc and write out short-term and long-term academic goals. Start the papers and projects way before they are due. For every hour spent in class should study double of the time.

Study skills effectiveness scores

Textbook Score: A score less than 30 suggest changes in textbook reading skills are likely to increase your grades.

Note-taking Score: A score less than 20 suggest changes in note-taking skills are likely to increase your grades.

Memory Score: A score less than 30 suggest changes in memory skills are likely to increase your grades. Test

Prep Score: A score less than 40 suggest changes in your test preparation skills are likely to increase your grades.

Concentration score: A score less than 35 suggest changes in your concentration skills are likely to increase your grades. Time Management Score: A score less than 20 suggest changes in time management skills are likely to increase your grades.

The data collected was entered in MS Excel 2010 and analysed using SPSS version 22. Descriptive statistical measures like percentage mean and standard deviations were applied. Other inferential statistical tests like chi square test to find out the associations, paired t test for academic performance before and after intervention, Mann Whitney test for difference in mean ranks in study skill scores between Government and private colleges, spearman correlation for academic skills and study skill scores were applied. The differences were interpreted statistically significant at $P < 0.05$. Data was presented as tables and charts as relevant.

RESULTS

Socio- demographic characteristics

Among 377 participants enrolled in the study, majority of the students in both private 171 (61.1%) and Government 91 (93.8%) colleges were aged >21 years. Mean age of students in private college was 20.7 ± 1.3 years and Government College was 21.13 ± 0.513 years. Majority of the participants in both private college 169 (60.4%) and 63 (64.9%) Government College were females.

Majority of participants in both private 246 (87.9%) and government 86 (88.7%) college were Hindus by religion. Majority of the participants in private 246 (87.9%) and government 92 (94.8%) college were hailing from urban areas. Majority 99 (35.4%) of participants in private college were in first year MBBS and 59 (60.8%) participants in Government College were in second year MBBS.

Comparison of study skills between Private and Government Colleges

Proportion of students with good text book reading, note taking, memory, test preparation skills was more in government medical college (85.6%, 95.9%, 58.8%, 72.2%) compared to private medical college (80.0%, 93.9%, 52.9%, 68.9%). But this difference was not found to be statistically significant (Table 1).

The mean study skill ranks related to note taking, memory, test preparation and time management were more in private medical college. Whereas text book reading and concentration skill mean ranks were more among the students of government medical college. The differences in mean ranks across the study skills between the medical colleges were not statistically significant (Table 2).

A significant positive correlation was seen between note-taking skills, memory skills and time management skills of private medical college students with their academic performance, whereas there was no statistically significant correlation between study skills and academic performance among government medical college students (Table 3). But there was a significant improvement in the academic performance of private medical college

students and government medical college students after the intervention (Table 4). The Comparison of study skill predictors of academic performance showed memory skill was good in both the medical college students, notes taking skills were good among government college students, and test preparation skill was good among private medical college students (Table 4).

Table 1: Distribution of study participants according to the study skills.

Study skill	Category	College		Total	Chi	P
		Private	Government			
Textbook reading	Good	224 (80.0)	83 (85.6)	307 (81.4)	1.477	0.224
	Poor	56 (20.0)	14 (14.4)	70 (18.6)		
	Total	280 (74.3)	97 (25.7)	377 (100.0)		
Note taking	Good	263 (93.9)	93 (95.9)	356 (94.4)	0.520	0.471
	Poor	17 (6.1)	4 (4.1)	21 (5.6)		
	Total	280 (74.3)	97 (25.7)	377 (100.0)		
Memory	Good	148 (52.9)	57 (58.8)	205 (54.4)	1.013	0.314
	Poor	132 (47.1)	40 (41.2)	172 (45.6)		
	Total	280 (74.3)	97 (25.7)	377 (100.0)		
Test preparation	Good	193 (68.9)	70 (72.2)	263 (69.8)	0.358	0.550
	Poor	87 (31.1)	27 (27.8)	114 (30.2)		
	Total	280 (74.3)	97 (25.7)	377 (100.0)		
Concentration	Good	128 (45.7)	42 (43.3)	170 (45.1)	0.170	0.680
	Poor	152 (54.3)	55 (56.7)	207 (54.9)		
	Total	280 (74.3)	97 (25.7)	377 (100.0)		
Time management	Good	234 (83.6)	81 (83.5)	315 (83.6)	0.011	0.99
	Poor	46 (16.4)	16 (16.5)	62 (16.4)		
	Total	280 (74.3)	97 (25.7)	377 (100.0)		

Table 2: Differences in study skill ranks between students of private and government medical colleges.

Study Skills	Private	Government	Z	P
Textbook Reading	188.5	190.3	0.141	0.888
Note-Taking	192.8	177.9	1.163	0.245
Memory	189.5	187.3	0.178	0.859
Test Preparation	192.5	178.9	1.068	0.289
Concentration	187.0	194.5	0.581	0.561
Time Management	190.2	185.3	0.387	0.699

Table 3: Correlation between study skill scores and academic performance of private and government medical college students.

Study Skills	Private		Government	
	r	P	r	P
Textbook Reading	0.068	0.364	0.100	0.328
Note-Taking	0.299	0.007	0.059	0.567
Memory	0.221	0.003	0.041	0.687
Test Preparation	0.050	0.530	0.147	0.647
Concentration	0.054	0.472	0.196	0.347
Time Management	0.283	0.014	0.051	0.621

Among the various study skills assessed in the study note taking and memory skills were the best independent predictors of academic performance, whereas in private

college, memory and test preparation were the best independent predictors of academic performance. These predictors were statistically significant (Table 5).

Table 4: Comparison of academic performance before and after intervention.

College	Before	After	Mean difference	t	P
Private	63.52 ± 5.41	66.53 ± 6.15	3.01	9.15	0.001
Government	64.45 ± 5.37	68.14 ± 5.62	3.69	13.83	0.001

Table 5: Comparison of study skill predictors of academic performance.

Medical College	Criteria	B	95.0% Confidence Interval for B		P
			Lower Bound	Upper Bound	
Government	(Constant)	823.672	732.510	914.834	0.000
	Note-taking	2.126	-2.071	6.323	0.320
	Memory	3.432	0.588	6.277	0.018
	Test Prep	0.148	-2.268	2.564	0.904
	Concentration	-1.627	-4.607	1.352	0.283
	Time Management	0.246	-2.596	3.088	0.865
Private	(Constant)	885.207	782.955	987.459	0.000
	Note-taking	-0.800	-5.542	3.941	0.738
	Memory	2.726	-0.180	5.632	0.066
	Test Prep	1.303	-1.292	3.899	0.321
	Concentration	-1.108	-3.901	1.684	0.432
	Time Management	-0.612	-4.162	2.938	0.733

Note: Linear regression

DISCUSSION

The present study was conducted to compare the study skills and strategies of the medical students among the medical colleges in Mysore, Karnataka, India. The results are discussed in the following headings.

Socio-demographic characteristics of study subjects

In the present study 115 (30.5%) of study participants are aged ≤ 20 years and 262 (69.5%) are aged ≥ 21 years. Mean age of students in private college was 20.7 ± 1.3 years and Government College was 21.13 ± 0.513 years. Among them 145 (38.5%) were males and 232 (61.5%) were females in both the medical colleges. In a study done by Alireza Didarloo et-al showed that 66.5% of the subjects were male (226) and 33.5%, females (114).¹² The mean and SD of the students' age were 22.56 ± 3.9 , and ranged from 18 to 41 years. Our study showed that majority 332 (88.1%) are Hindu by religion, 28 (7.4%) are Muslims 12 (3.2) are Christians and 5 (1.3%) are in other religion. Majority 338 (89.7%) of the students are from urban areas and only 39 (10.3%) are from rural areas. In state wise distribution of students majority 258 (68.4%) of the students are from Karnataka and 119 (31.6%) students are from outside Karnataka in India.

Study skills in medical colleges

The present study showed that majority of the students are having good study skills scores in textbook reading 307 (81.4%), note taking 356 (94.4%), memory skills 205 (54.4%), test preparation 263 (69.8%) and time management 315 (83.6%). Only 207 (54.9%) students are having poor concentration skills.

In a study done by Chitra Nagaraj et-al taking notes while reading, rewriting lecture notes and reviewing lecture notes were associated with good performance.¹³ Quantifying the odds of good performance, this study revealed that for every unit increase in note taking skills the odds of good performance increased by 9%, taking notes while reading textbooks and rewriting lecture notes increases the odds of good performance by 36% and 45% respectively. Memorizing notes and failure to organize main ideas and details were associated with bad performance. Memorizing notes and failure to organize main ideas and details into logical and meaningful order reduced the odds of success by 36% and 30% respectively.

Note taking skills were significantly associated with good performance of medical students. Nourian et-al evaluated the study habits and skills in medical students and interns

using a general information questionnaire and a specific researcher developed validated questionnaire on study skills and found that medical students had a problem with time management, concentration, reading speed, note taking, study habits and comprehension.⁵

Comparison of Study Skills among Government and Private Medical Colleges

The present study showed that the mean study skills scores of textbook reading (190.3) and concentration (194.5) are more in government medical college students when compared to private medical college students. But the mean study skills scores of note-taking (192.8), memory (189.5), test preparation (192.5) and time management (190.2) are more in private medical college students compared to government medical college students. McManus et-al, studied the clinical experience, performance in final examinations and the study habits and learning style in medical students using Biggs validated study skills questionnaires prospectively.⁶

The Biggs questionnaire tests the learning process and considers the study habits to be a superficial or a deep approach to learning. Their important finding was a success in the final examination was related to a strategic or deep study habits in the final year, although not at the time of entry to medical school, thus highlighting that study habits are an important factor for predicting success.

Correlation between academic performance and study skill scores among the students studying in Government and Private Medical Colleges

This present study showed the correlation between the study skill scores and academic performance of private and government medical college students. The note-taking skills, memory skills and time management skills of private medical college students and their academic performance were correlated significantly.

There was a significant improvement in the academic performance of private medical college students by 3.01 and government medical college students by 3.69 after the intervention. Nourian et-al did not relate their results to the term end University examinations, whereas in the present study the study skills were correlated with the term end University examinations.⁵ Academic achievement of students in Kerman University of Medical Sciences used a researcher made questionnaire of study skills containing 18 items on note taking along with other parameters.⁷ The mean scores of students for note taking was 46.43 ± 13.8 (range 18-90). The major defects in the study skills of the students were planning and time management followed by concentration and note taking skills. Study skills had a significant correlation with educational achievement ($r=0.101$, $P<0.05$).

Chitra Nagaraj et-al evaluated the performance of the students by using the marks obtained by them in the university, which showed that poor study skills being an important cause of poor performance.¹³

Frank way back in 1977, studied the effects of four 2 hour study skills seminars for a treatment and control group at York College, Pennsylvania which showed that those who attended the study skills workshop, had significantly improved in all the three study skills areas or study techniques, study organization survey and study motivation survey and they made the recommendation of an ongoing campus wide developmental course in study skills be established and also continue further research on study skills.⁹

CONCLUSION

When the cut-off values were taken into account, students with good text book reading, note taking, memory and test preparation skills were more from Government medical college, where as students with good concentration and time management skills were more from private medical college.

The mean study skill ranks related to note taking, memory, test preparation and time management were more in private medical college. Whereas text book reading and concentration skill mean ranks were more among the students of government medical college. It can be observed that, there was a significant positive correlation between note-taking, memory and time management skills of private medical college students with their academic performance.

But there was a significant improvement in the academic performance of both private and government medical college students after the intervention, which concentrated more on where they are lagging behind.

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REFERENCES

1. Contributions of Study Skills to Academic Competence. ISSN-0279-6015. Educational Resources Information Center. N/A. Retrieved 2009-02-01.

2. Bremer, Rod. The Manual - A guide to the Ultimate Study Method. (USM); Amazon Digital Services. Retrieved 2010-03-01
3. Bhagat V, Nayak RD. Exploring the Changes in Learning Approaches Before and After the Study Skill Training Programme among Medical Students. *International Journal of Humanities and Social Science Invention*. 2013;2(4):32-5.
4. Biggs JB Learning Process Questionnaire (LPQ): Manual. Hawthorn, Vic.: Australian Council for Educational Research. URL available from http://www.johnbiggs.com.au/pdf/ex_2factor_spq.pdf
5. Biggs JB. Student Approaches to Learning and Studying. Camberwell, Vic: Australian Council for Educational Research. URL available from http://www.johnbiggs.com.au/pdf/ex_2factor_spq.pdf
6. Biggs JB. Student learning in science: a longitudinal study using the Biggs SPQ. In: HERDSA Annual International Conference. Melbourne, 12-15 July 1999. URL available from <http://www.aeee.com.au/conferences/2011/papers/AAEE2011/PDF/AUTHOR/AE110138.PDF>.
7. Marton F, Saljo R. Symposium: Learning processes and strategies: II. On qualitative differences in learning: II. Outcome as a function of the learner's conception of the task. *British Journal of Educational Psychology*. 1976;46:115-27.
8. Entwistle N. Styles of Learning and Teaching: An Integrated Outline of Educational Psychology for Students, Teachers, and Lecturers. New York, NY: Joh Wiley and Sons.
9. Garcia R, Perez F, Talaya I. New university students' instructional preferences and how these relate to learning styles and motivational strategies. *Electronic Journal of Research in Educational Psychology*. 2008;6:547-70.
10. Kember D, Leung DYP, McNaught, C. A workshop activity to demonstrate that approaches to learning are influenced by the teaching and learning environment. *Active Learning in Higher Education*. 2008;9:43-56.
11. Leung, DYP, Ginns, P, Kember, D. Examining the cultural specificity of approaches to learning in universities in Hong Kong and Sydney. *Journal of Cross-Cultural Psychology*. 2008;39:251-66.
12. Didarloo A, Khalkhali HR. Assessing study skills among university students: an Iranian survey. *J EducEval Health Prof*. 2014;11:8.
13. Nagaraj C, Pradeep BS. Why do medical students under-perform? A cross-sectional study from Kempe Gowda Institute of Medical Sciences, Bangalore. *J NTR Univ Health Sci*. 2014;3:92-6.

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