

A STUDY ON PREDICTING ACADEMIC PERFORMANCE OF THE FIRST YEAR MEDICAL UNDERGRADUATE STUDENTS

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ABSTRACT

Background: Students in many Asian countries are qualified to seek admission to undergraduate medical degree soon after they leave the secondary schools. Selection criteria vary in different countries. In an effort to standardise the admission procedures Medical Council of India(MCI) has introduced National Eligibility Cum Entrance Test (NEET) as the entry requirement for the undergraduate medical course from this year. In addition to the scholastic success guided by cognitive factors, non-cognitive factors could also have a direct positive relationship to student's academic performance.

Materials and Methods: One hundred and fifty-two, first year medical undergraduate students were briefed about this project. The students filled a questionnaire containing 70 items distributed in 3 sections (i) Preliminary interview (ii) Learning strategy survey and (iii) Approaches to study skills inventory (ASSIST). The scores were analysed statistically and any correlation between parameters were identified

Results: Majority of students in this cohort were well motivated. The number of students with inadequate learning strategies were more, compared to those with well equipped strategies. The deep and strategic approach had moderately high scores compared to surface apathetic approach.

Conclusion: Small number of students were not motivated and needed to be guided in this aspect. Many students needed monitoring especially in their learning and test taking strategies. Moreover surface apathetic approach (fear factor) required to be eliminated effectively by faculty members.

KEY WORDS: academic performance, undergraduate medical students, National Eligibility Cum Entrance Test (NEET), cognitive factors, non cognitive factors, learning strategies, deep approach, strategic approach, surface apathetic approach, motivation.

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INTRODUCTION

Students from diverse academic and socio-economic backgrounds seek admission to the medical colleges. The admission qualifications and

entry criteria vary greatly in different countries. However, in many Asian countries, students are qualified to seek admission to undergraduate medical degree course soon after they leave the

secondary schools. Moreover in these countries, there are far too many students competing for limited number of seats [1]. Selection criteria vary greatly, depending upon the country and even within the same country, different entry qualifications and procedures are in vogue [2,3]. In an effort to standardise the admission procedures, Medical Council of India (MCI) has introduced National Eligibility Cum Entrance Test (NEET) as the entry requirement for the undergraduate medical course from the current year 2016. Further, MCI has also suggested that it may be desirable to introduce an exit examination which will screen the academic competencies of the qualifying doctors, who are expected to carry out healthcare activities in the country. These efforts would, address the issue of academic competencies of the incumbent medical graduate.

In most of the cases, faculty members do not play a role in the selection of the students, except in very few select institutions, where a panel of academicians perform this task. However, the responsibility of helping the students to progress in their career rests entirely on the academicians. Authorities have adopted diverse methods to achieve this. Thus, Arabian Gulf University [4] and a medical college in Iran [5] and in Chile [6,7] have set a grade of 80-90% in high school, national university entrance examination (Konkoor) score along with an interview [8] to test their affective [9] and psychomotor skills which have been set as a requirement for admission. There have been reports suggesting various parameters as predictors of academic excellence during the medical graduate course. Medium of instruction during secondary school education posed as an important factor contributing to a successful graduate course education. Hence English medium education has been identified quite often as an enhancing factor for success [10].

It is well known that scholastic success is guided by cognitive factors like pattern of thinking, levels of interaction, adaptation over time. In addition to these, success of a medical graduate is also dependent upon other qualities such as commitment to practice medicine, compassion, empathy, sense of professionalism which are collectively grouped as non-cognitive

factors. These factors may have a direct positive relationship to student's performance and their future outcomes. Moreover all these factors tend to act as variables which could influence the progress of a prospective medical student in his/ her journey of medical graduation and in their future career. Incidentally, these variables act also as significant predictors of academic success in the realm of medical education.

The present study, conducted in a private medical college in Tamilnadu, India is governed by the rules and regulations laid down by MCI and has students entering the undergraduate course in Medicine, based on the secondary school leaving grades in Physics, Chemistry and Biology. Since the literature is scanty regarding the academic attitude of the undergraduate medical students and their competencies, it was planned to interview the students to assess their learning habits in an effort to 'predict' their academic performance, based on their academic record. The aim of this study is to identify the student's motivation to pursue this most coveted course, their learning strategies and the tri-dimensional approaches-deep, strategic and surface apathetic approaches which act as predictors for their academic performance in the first year medical undergraduate students.

MATERIALS AND METHODS

One hundred and fifty-two first year medical undergraduate students belonging to three different batches were registered for this study, after obtaining their consent. The group of students were briefed about the project and instructions were given for them to fill-up the questionnaire. The questionnaire contained 70 items distributed in 3 sections as follows: (i) Preliminary interview (ii) Learning Strategy Survey and (iii) Approaches to study skills inventory for students (ASSIST). Appropriate institutional ethics approval (104/MMCH& RI/ 2016) was obtained for this study.

(i) Preliminary interview: This section contained questions which were designed to find out details of the family background of the student, his/her academic traits, information on personality, motivation for academics and their study habits. Scoring for this section was fixed

such that it gave a range of 0 to 8. Three out of eleven questions were meant to know their study habits, hence were not credited with a score.

Additionally, this interview also aimed to find out the ability of the students to tackle their concerns while undergoing the training and to master the course content.

(ii) Survey of Learning Strategy: This section had a combination of open and close ended questions seeking students learning habits [11]. In addition it had an undertaking with the responsibility of bringing in changes to his/her learning habits, which was to be signed by the student. It was in the form of a contract to be entered into between the mentor and the student.

(iii) Approaches and Study Skills Inventory for Students (ASSIST): Learning styles included the motivation for learning and the various approaches of the students to the task of learning [12]. In this study the tripartite model, using three learning approaches- deep, strategic and surface apathetic approach based on the inventory developed by Tait. H et al (1998) [13] was used. In the deep approach [14], subscales contained questions to identify whether the student sought the meaning of the learning content, related to ideas, used evidence, and was interested in the ideas (Table 1). There were 12 questions distributed in 4 subscales. This suggests that the student is interested in understanding the deeper meaning of the content. Strategic approach [15] contained 12 questions in the following 4 subscales: the level of their ability to organize themselves, time management, achieving their goals, alertness to assessment demands and monitoring their effectiveness continuously (Table 1). This approach suggests students have the desire to succeed. However, their understanding of the subject was patchy and variable. Surface apathetic approach also contained 12 questions in 5 subscales. These questions were posed to identify if there was a lack of purpose, unrelated memorising, tendency to be bound to the syllabus and the fear of failure. (Table 1). In this approach the students relied on rote learning and focussed only on particular tasks. These questions were scored according to Likert scale. The scores were

documented and analysed using SPSS windows version 2.1 to check for correlation between the parameters, if any.

Table 1:
Distribution of ASSIST Items according to the scale and subscales.

Scale/Sub-scale	
(i) Deep scale	
(a)	Seeking meanings
(b)	Relating ideas
(c)	Use of evidence
(d)	Interest in ideas
(ii) Strategic scale	
(a)	organized study
(b)	time management
(c)	achieving
(d)	alertness to assessment demands
(e)	monitoring effectiveness
(iii) Surface apathetic scale	
(a)	lack of purpose
(b)	unrelated memorizing
(c)	syllabus boundness
(d)	fear of failure

Table 2: Results of Descriptive statistics showing the minimum, maximum, mean and standard deviation in ASSIST study.

Different approaches	Number of students	Minimum	Maximum	Mean	Standard deviation
Deep	152	38	92	65	0.913
Strategic	152	31	100	65	1.067
Surface apathetic	152	13	96	50	1.543

Fig. 1: Results of the preliminary interview showing frequency of motivated students.

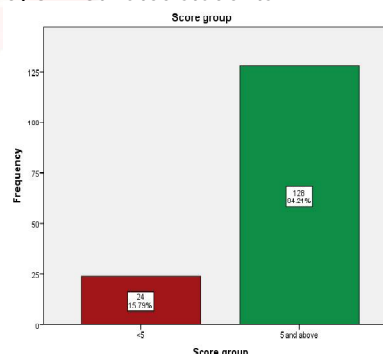


Fig. 2: Results showing frequency of effective Learning and Test taking strategies. Positive score- percentage of students with effective learning strategies and Negative score- percentage of students with non effective learning strategies.

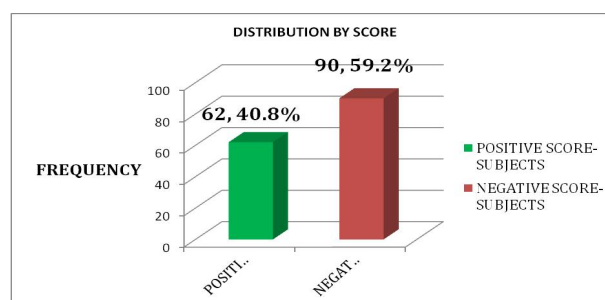


Fig. 3: Results regarding approaches to learning. Fig. 3a Frequency distribution of deep approach. Fig. 3b. Frequency distribution of strategic approach Fig. 3c. Frequency distribution of surface apathetic approach.

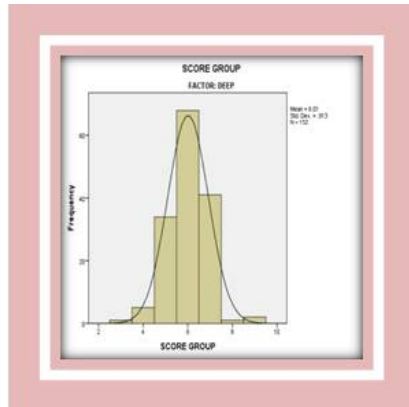


Fig: 3a

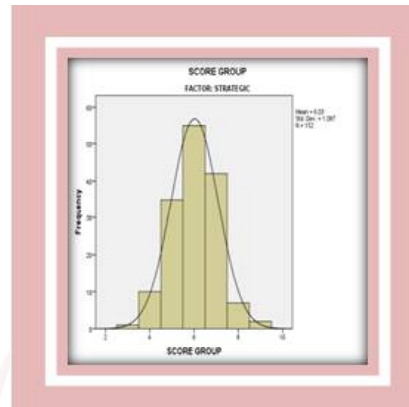


Fig: 3b

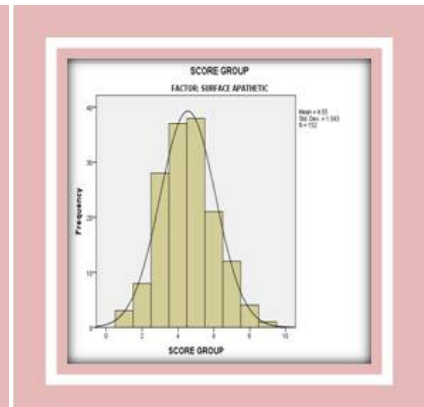


Fig: 3c

RESULTS

Preliminary interview: Out of 152 students 84.21% (128 students) were motivated, understood the importance of having to undergo an intensive training and were focussed. Whereas, 15.79% (24 students) lacked the initiative and were compelled to take up a course in medicine against their wish (Figure 1). Many students failed to appreciate the importance of a medical career.

Survey of Learning Strategy: Results revealed that 40.8% (62 students) possessed effective learning strategies to study, competently prepare, face the stressful examinations and progress satisfactorily in all 3 subjects of the first year medical course. It was observed that 59.2% (90 students) were inadequately prepared to understand the prolonged working hours which is consistently required to assimilate scientific evidence, study, reflect, and evaluate their learning skills (Figure 2).

Approaches and Study Skills Inventory for students (ASSIST): The deep and strategic approach had moderately high scores compared to surface apathetic approach (Table 2). Yet all three had a perfect normal curve with high frequencies seen in the centre and low frequencies are seen in both extremities (Figure 3a to 3c).

DISCUSSION

Combination of many variables are chosen to predict the academic performance of medical students [16, 17, 18, 19]. Various cognitive factors have been identified as contributory to the learning outcome of medical students in the

past. In recent years, various non-cognitive factors also have been attributed to the performance of the medical students [20]. These factors significantly contribute to the success of a medical practitioner in the making. This research is a pilot study to analyze the impact of motivation, learning strategies and approaches to learning as predictors of academic performance in the first year of undergraduate medical curriculum.

There have been many studies which include variables like high school grades, admission interview, entrance exam score, personality traits as significant predictors of academic success [6, 7, 21]. A possibility of employing the predictive power of personal statements and evaluations to improve the academic performance has not been explored fully. This forms an important part of current selection process in developed countries such as United Kingdom [12]. A few similar studies have been reported from medical schools in other countries as well, out of which many are from countries in the Middle East. Studies focussing on these attributes in Indian medical students are scanty. Present study is a preliminary attempt to utilise the personal statements of the first year medical undergraduate students in the form of responses to questionnaire and personal interview to predict their academic achievement.

There are studies which identify students at risk of failure, based on the cognitive factors like the previous performance and current performance [22, 23, 24]. This study tries to identify a combination of factors like learning strategies, motivation and approaches to learning as predictors

of progress in medical curriculum. Medical curriculum involves intense training, dedication of time and effort by students. Medical education is supported also by heavy funding and non-completion of the course can be a burden to the society [22]. To avert this problem it becomes important to identify the students who require remedial measures and implement early intervention [23, 25]. These students who lack motivation require a support system, if they were to continue the course. If it is possible to predict students who might have trouble in achieving the required academic competencies, it should be possible to help these students by way of tutoring or mentoring, thereby ensuring continued progress of the students and avoid failures. Nottingham studies suggest that 10-15% of the medical student intake face crucial problems academically [26]. Though these students have been selected to undergo the medical studies by stringent cognitive screening procedures, it shows that non-cognitive factors could also contribute significantly in completing this course successfully. This study has used these non-cognitive factors as well in attempting to predict their academic success.

Most of the students who participated were well motivated which showed they were determined to complete their medical studies in right earnest. Small number of students who were not motivated and took this course on account of some pressure need to be guided to pursue the course or other options should be sought early.

Many students in this cohort required guidance on learning and test taking strategies in order to accomplish success in completing their curriculum within stipulated time. To assess this, monitoring the program needs to be implemented.

Students in this study had a satisfactory deep and strategic approach but it also showed that surface apathetic (fear factor) approach has to be effectively eliminated with constant reinforcement by the faculty, thereby providing additional guidance and appropriate mentoring [27]. The students with low surface apathetic approach (fear factor) had to be addressed as rote learning may not be helpful to complete this professional course and this deficit can be easily corrected with appropriate measures.

CONCLUSION

This programme has brought out the role of the non-cognitive factors in predicting the academic performance of the preclinical students. It is highly desirable to use these effective tools to assess the academic performance of the preclinical students, in order for them to continue their course without much interruption and the students will be able to look forward, enjoy and pursue their clinical years with confidence.

Conflicts of Interests: None

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