Original Article

Assessment of nonscholastic abilities and its associated factors among medical students: An exploratory study

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ABSTRACT

Background: Nonscholastic abilities among medical students are an important area of concern for the health professionals. Very few studies had been conducted in the past with regard to it. **Objective:** This study was an exploratory study aimed to assess the nonscholastic abilities among medical students in a medical institution in coastal South India. **Materials and Methods:** This study assessed three broad domains of nonscholastic abilities namely personal qualities, interpersonal activities, and communication skills among 106 medical students using a structured questionnaire (27 questions with a total score of 27). The data were analyzed by independent *t*-test and linear regression model. **Results:** About 41.5% (44) of the subjects were males and 52.8% (56) of them were belonged to 18–19 years age group. Overall mean score of nonscholastic abilities was found to be 19.40 (standard deviation = 3.27). Percentile distribution of subjects is at score 17 (25th percentile), 20 (50th percentile), and 22 (75th percentile). Mean personal quality domain score was found to be proportionately lesser than other domains of nonscholastic abilities. Nonscholastic ability score was significantly associated with marks obtained in the previous examination ($P = 0.006$). However, linear regression analysis revealed that the presence of family problems ($P = 0.005$) and alcohol use ($P = 0.026$) were associated with low nonscholastic ability score among medical students. **Conclusion:** Nonscholastic abilities are still a required need in medical student's career. Further analytical studies will help in identifying the in-depth evaluation of factors associated with it.

Key words: India, medical students, nonscholastic abilities

INTRODUCTION

In addition to the academic achievement, there is an increased need to seek evidence for the nonscholastic abilities which include the personal qualities of medical students in medical colleges.[1] Medical students should emerge with enthusiastic, compassionate character which will help to treat patients to the best of their ability.[2] A recent study identified up to 87 different personal qualities relevant to the practice of medicine and selecting the most salient of these that can be practically measured is a challenging task. There is a need to operationally define the most important qualities in a cost-effective manner and overcoming cunning adversaries who, with the incentive and resourcefulness, can potentially invalidate such measures.[3]

Senior medical radiation scientists identified certain nonacademic qualities required for excellence in the practice of the professions.[1] This includes both personal and environmental factors which play a major role in physician professionalism. Accordingly, institutions should consider these factors to promote physician professionalism.[4] Medical school curricula may require adaptation to support the personal qualities of those now entering the profession.[5] Limited

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research was reported on the assessment of nonscholastic abilities by the medical students. The range of desirable personal abilities of a doctor varied according to student characteristics including their prior educational experience.[6]

Nonscholastic abilities in the medical profession can be defined as general abilities that are not specific to medicine, and these abilities are needed for effective functioning of any medical professional person. These nonscholastic abilities include personal characteristics, interpersonal activities, and communication skill domains. These personal abilities are more related to the affective domain and are important for overall learning during the undergraduate course when the students function in a group. These abilities also predict the later performance of the students as doctors.[7] Nonscholastic abilities are as important as scholastic abilities. It has been challenging for the medical teachers to capture abilities and outcomes such as critical thinking, communication skills, leadership and team work, and professionalism including ethics, humanistic aspects, which bring about the need to assess nonscholastic abilities in a systematic and comprehensive manner. However, there is a lack of standard instruments or indicators to quantify and measure these abilities. The evaluation of it faces many difficulties since it has many variables which are subjective in nature. With this background, this study was conducted with the following objectives:

1. To assess the nonscholastic abilities among undergraduate medical students that include personal qualities, interpersonal activities, and communication skill domains
2. To find out the association between nonscholastic ability with age, sex, any chronic morbidity, family problems, alcohol use, and marks obtained in the previous examination.

MATERIALS AND METHODS

Setting
This cross-sectional exploratory study was conducted in a medical institution during the period from March 2011 to August 2011. The study subjects included undergraduate 2nd and 3rd year medical students who were posted in community diagnosis posting in the Department of Preventive and Social Medicine during the period. To look for the association of the nonscholastic ability with the previous year's marks obtained, we selected the above target group for our study purpose.

Sample size estimation and sampling technique
By considering 1% as standard error and 5% as standard deviation (SD) at 95% confidence interval level, minimum sample size was estimated to be 97. After adding a nonresponse error of 10%, total sample size became 107. We selected 2nd and 3rd year medical students for the study purpose, and there were about 80 and 70 students in the 2nd and 3rd year, respectively. We followed probability proportional to size method to select the subjects from each class. Accordingly, 57 and 50 subjects were considered from 2nd and 3rd year class,

respectively. The subjects were selected by a simple random technique from each class.

Questionnaire
As presently there is no standardized tool to assess nonscholastic abilities among undergraduate medical students, we developed structured questionnaire by taking three broad domains namely personal qualities, interpersonal activities, and communication skills based on the lines of items taken from Association of Indian Universities which included communication skills, social skills, personal qualities, interest, positive attitude, and creativity.[8]

Personal quality domain (regularity, punctuality, hard work and attitude to work, inventiveness, originality and initiative, dependability, and psychological robustness)
a. Are you go regularly to most of the classes/practical sessions?
b. Are you go on time to most of the theory and practical classes?
c. Are you have an interest in most of the classes/practical sessions held?
d. Are you have any problem of having concentrating in class?
e. Do you work regularly and your output and quality of work performance are within acceptable levels?
f. Are you involved in any team work related to your studies?
g. Are you dependable on others in your studies?
h. Do you initiate any new innovative matter related to your study?
i. Are you psychological upset sometimes during studies?
j. Do you take part in sports or any other games?
k. Do you have any extracurricular activities/hobbies? If yes specify
l. Do you involved in any social service activity to the needy in the community?
m. Do you have a fair knowledge of computer and internet?
n. Are you practice currently any spiritual related activity?

Interpersonal activities domain
a. Are you polite most of the time?
b. Do you respond to questions?
c. Are you able to regulate verbal and physical aggression?
d. Are you able to act independently in social interactions?
e. Are you able to maintain a friendship?
f. Do you show physical expression of affection and desire?
g. Do you have any interpersonal problems with other persons?

Communication skill domain (skills in writing and talking) and ability to communicate with peers, teachers, patients, and assertiveness)
a. Do you avoid talking to people?
b. Do you ever visit others?
c. Are you able to start, maintain, and end a conversation?
d. Do you understand body language and emotions of others such as crying and screaming?

e. Do you indulge in reading and writing?
f. Do you encourage others to be more sociable?

At the first step, pilot testing was done where we analyzed the feasibility and response to the questionnaire according to the responder opinion by administering it to 20 medical students, and they were not included in the final analysis. After an expert opinion from the two senior faculties from the Medical Education Department of the institute, minor modifications were done in the questionnaire. The total number of questions in all above parameters is 27 with a score of 0 or 1 for each question, and thus the total score ranges from 0 to 27. Score 1 for each positive response except questions "d," "g," and "i" in personal quality domain, "g" for interpersonal activity domain and "a" for communication skill domain where positive response was given 0 score. The personal quality domain had 14 questions, interpersonal activities had seven questions, and communication skill had six questions.

Informed consent was taken from the medical students. The questionnaire was distributed to the students in the practical session of community diagnosis posting in Preventive and Social Medicine Department to assess nonscholastic abilities and its associated factors. Alcohol use was defined as any subject who consumed alcohol during the last 1 month period. The presence of family problem was assessed based on the subjective reports by the students regarding the presence of family conflicts or financial issues or morbidities or any other matter in their family members.

Statistical analysis
Data collected regarding various nonscholastic abilities and its associated factors were SPSS version 19.0 (IBM PASW Statistics, India Country Office, Bangalore) and analyzed using independent t-test and linear regression analysis.

RESULTS

A total of 106 subjects completed the questionnaire. About 41.5% (44) of the subjects were males, and 58.5% (62) were females. About 52.8% (56) of them were belonged to 18–19 years age group. Overall mean score of nonscholastic abilities was found to be 19.40 (SD = 3.27) with a minimum sore of 8 and a maximum score of 25. Percentile distribution of subjects is at score 17 (25th percentile), 20 (50th percentile), and 22 (75th percentile). Furthermore, mean personal quality score was found to be proportionately lesser than other domains of nonscholastic abilities [Table 1].

There was no statistically significant association between personal qualities and its associated factors that include age group, sex, alcohol use, family problems, chronic morbid conditions, and marks obtained in the previous examination in independent t-test, but linear regression analysis showed that family problems ($P = 0.021$) and alcohol use ($P = 0.003$) were found to be significantly associated with personal quality [Table 2]. For interpersonal activities and communication skill, mark obtained in the previous examination was found to be significant ($P < 0.01$) [Tables 3 and 4]. For overall nonscholastic ability, it was found that marks obtained in the previous examination were found to be a significant factor ($P = 0.006$) [Table 5].

Linear regression analysis revealed that family problems and alcohol use were significantly associated with personal qualities and overall nonscholastic abilities among medical students [Tables 6 and 7].

DISCUSSION

The study highlights about the nonscholastic abilities among medical students and its associated factors in the domains of personal qualities, interpersonal activities, and communication skills. It is important for the medical teachers to capture these abilities in a comprehensive manner as there is a paucity of data and related instruments with regard to it.

This study found that personal quality domain score was average among medical students which is a matter of concern. Various studies showed that personal quality among the medical students is an important character that

Table 1: Nonscholastic ability scores of study population ($n=106$)

Domains (maximum score)	Mean score (SD)
Personal qualities (14)	8.68 (2.02)
Interpersonal activities (7)	5.72 (1.17)
Communication skill (6)	5.0 (1.17)
Final score (27)	19.40 (3.27)

SD=Standard deviation

Table 2: Personal qualities score according to associated factors ($n=106$)

Associated factors	Number of subjects	Mean (SD) score	P
Age (in years)			
18-19	56	8.57 (2.23)	0.110
20-22	50	8.80 (1.77)	
Sex			
Male	44	8.52 (2.14)	0.482
Female	62	8.79 (1.94)	
Alcohol use			
Yes	6	6.33 (2.16)	0.829
No	100	8.82 (1.93)	
Family problems			
Yes	24	7.83 (2.22)	0.770
No	82	8.93 (1.90)	
Chronic morbid conditions			
Yes	4	7.75 (0.957)	0.133
No	102	8.72 (2.05)	
Marks in previous exam (%)			
<50	5	7.60 (1.95)	0.642
≥50	101	8.73 (2.02)	

SD=Standard deviation

Table 3: Interpersonal activities score according to associated factors (n=106)

Associated factors	Number of subjects	Mean (SD) score	P
Age (in years)			
18-19	56	5.87 (1.09)	0.502
20-22	50	5.54 (1.23)	
Sex			
Male	44	5.57 (1.26)	0.137
Female	62	5.82 (1.09)	
Alcohol use			
Yes	6	5.33 (1.86)	0.143
No	100	5.74 (1.12)	
Family problems			
Yes	24	5.33 (1.37)	0.116
No	82	5.83 (1.09)	
Chronic morbid conditions			
Yes	4	5.50 (1.29)	0.834
No	102	5.73 (1.17)	
Marks in previous exam (%)			
<50	5	4.60 (2.41)	<0.001*
≥50	101	5.77 (1.07)	

*P<0.05 is considered as significant. SD=Standard deviation

Table 4: Communication skill score according to associated factors (n=106)

Associated factors	Number of subjects	Mean (SD) score	P
Age (in years)			
18-19	56	4.89 (1.20)	0.280
20-22	50	5.12 (1.14)	
Sex			
Male	44	4.86 (1.27)	0.080
Female	62	5.09 (1.09)	
Alcohol use			
Yes	6	4.83 (0.98)	0.391
No	100	5.01 (1.18)	
Family problems			
Yes	24	4.62 (1.47)	0.155
No	82	5.11 (1.05)	
Chronic morbid conditions			
Yes	4	5.0 (0.82)	0.34
No	102	5.0 (1.19)	
Marks in previous exam (%)			
<50	5	3.80 (2.49)	0.002*
≥50	101	5.06 (1.06)	

*P<0.05 is considered as significant. SD=Standard deviation

helps in a better doctor-patient relationship.[1,3,5,9] However, the results of our study may not be compared with other studies due to the difference in the methodology adopted, instruments used, study group taken, analysis, and regional difference because of different sociocultural factors affecting it. It was also found in our study that the presence of family problems and alcohol use was associated with the lower personal quality score. In view of the above finding, it is suggested that screening and counseling on these aspects may help in improving the personal qualities among the medical students.

Interpersonal activities and communication skill score were comparatively good and associated with marks obtained in the previous examination in our study. A recent study highlighted the comparison of medical students' and residents' conceptual structures of empathy with respect to a qualitative difference. Residents show more empathy to their patients by a cognitive decision as clinicians than medical students do.[10] A study showed that although medical students seem to have realized the importance of communication skills training for the practice of medicine, a significant minority has reservations on attending such sessions.[11] Training to medical students on these aspects can be strengthened based on the skill required. Formal courses for these skills during the clinical years and training sessions for the faculty along with further studies across different semesters will elicit the correct situation analysis of various aspects of communication.[12]

Nonscholastic abilities will differ according to the demographic and sociocultural characteristics of the subject. The Medical Council of India recommends the assessment of following nonscholastic abilities during internship of medical students which include responsibility; punctuality; workup of case; capacity to work in a team; behavior with colleagues and nursing staff; relationship with paramedicals and initiative; and participation in discussions and research activities.[13] In view of the above and based on its importance, it is insisted that the assessment may be expanded to graduate and postgraduate medical students and paramedical staff so that appropriate interventional measures may be adopted.

It was found that overall nonscholastic ability is above average. Among those with low abilities, certain factors were found to be more such as family problems and alcohol use. This may be because of the psychological impact of these factors which may influence their learning.

Limitations
This study has got its own limitations due to cross-sectional nature of the study. It cannot be generalized to other medical students because of smaller sample size, lesser age group variation, and regional variation due to training and learning processes. Besides, subjective and recall bias were also the limitations of the study. Furthermore, there is a need for assessment of the validity of questionnaire as it is subjective in nature. By applying psychological tests or observations over a period of time will reduce the subjectivity and increase the validity of the study.

CONCLUSION

Nonscholastic abilities are still a required need in medical student's career. Medical teachers need to be aware of the importance of nonscholastic abilities of their students, and its influence on learning and later practice of medicine.

Table 5: Overall nonscholastic ability score according to associated factors (*n*=106)

Associated factors	Number of subjects	Mean (SD) score	*P*
Age (in years)			
18-19	56	19.38 (3.22)	0.325
20-22	50	19.42 (3.34)	
Sex			
Male	44	18.95 (3.60)	0.221
Female	62	19.71 (3.01)	
Alcohol use			
Yes	6	16.50 (3.27)	0.750
No	100	19.57 (3.20)	
Family problems			
Yes	24	17.71 (3.96)	0.078
No	82	19.89 (2.88)	
Chronic morbid conditions			
Yes	4	17.75 (2.22)	0.444
No	102	19.46 (3.29)	
Marks in previous exam (%)			
<50	5	16.0 (5.70)	0.006*
≥50	101	19.56 (3.05)	

*$P<0.05$ is considered as significant. SD=Standard deviation

Table 6: Association of personal qualities: Linear regression analysis

Associated factors	Standardized B coefficient	*P*
Age (in years)	0.022	0.816
Sex	0.014	0.882
Alcohol use	−0.286	0.003*
Family problems	−0.220	0.021*
Chronic morbid conditions	−0.065	0.499
Marks in previous exam (%)	0.085	0.382

*$P<0.05$ is considered as significant. $R^2=0.151$

Table 7: Association of nonscholastic abilities: Linear regression analysis

Associated factors	Standardized B coefficient	*P*
Age (in years)	−0.008	0.935
Sex	0.068	0.478
Alcohol use	−0.210	0.026*
Family problems	−0.270	0.005*
Chronic morbid conditions	0.143	0.141
Marks in previous exam (%)	−0.045	0.632

*$P<0.05$ is considered as significant. $R^2=0.164$

Conflicts of interest

There are no conflicts of interest.

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