

Aptitude of Medical Students at the Entry Gate of Medical Career: A Cross-Sectional Study at Faisalabad Medical University, Faisalabad

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ABSTRACT

Background: A large number of students aim to seek admission to medical colleges. Motivational factors that drive students towards a medical career and how suitable students are in terms of aptitude for medicine is largely unknown, especially in our setting as little research has been conducted on this topic. **Objective:** Our objectives were to explore the current aptitude of the medical students, and predicting the specialty aptitude of medical students at the time of entry in medical college. **Study Design:** Questionnaire-based cross-sectional study. **Settings:** Faisalabad Medical University, Faisalabad Pakistan. **Duration:** Two months from March 01, 2020 to April 30, 2020. **Methods:** A questionnaire-based cross-sectional study of 1st-year medical students at Faisalabad Medical University was conducted in which they were asked to answer questions pertaining to their current aptitude and future specialty aptitude. The answers were analyzed to get an understanding of current and future aptitudes. **Results:** Substantial numbers of currently enrolled medical students were having aptitudes not matching with the opted medical career. **Conclusion:** A potential new understanding of the relation between local cultural and societal factors to aptitude is needed to devise a better selection procedure for correct allocation of our limited resources to the more suitable and highly motivated students.

Keywords: Medical students, Medical schools, Clinical competence, Aptitude tests, Aptitude, Personality.

INTRODUCTION

In the 2019 MDCAT exam held in Punjab, 72,173 candidates¹ competed for 3022 public MBBS seats², meaning that only 4.18% of applying students could ever secure a public seat. Selecting the most suited candidates lies in two consequences. Firstly, candidates must have the ability to acquire clinical skills and knowledge. Secondly, there is a need that candidates become the type of doctor people want, that is, being people-centred, empathic, and having a holistic approach.

It is said that there is a need for a fit between personality and the career one chooses.³ According to Holland Codes the members of a particular occupation share histories of personal development and hence, personality. Physicians possess characteristics from three distinct personality types: investigative, social, and artistic.³ The Big Five personality traits extraversion, neuroticism, openness to experience, agreeableness, and conscientiousness as dimensions of personality. For future professional collaboration, interpersonal dynamics, and communication skills two dimensions, extraversion, and agreeableness, have shown to be important.⁴

Aptitude tests are usually designed to indicate intrinsic or dispositional fitness for some particular job.⁵ However the definition of aptitude in the context of medicine is very difficult to define and establish as medicine is not a unitary thing. To come up with a comprehensive definition of medical aptitude we need to include dimensions of domain-specific knowledge, cognitive skills, communication skills, and interpersonal understanding.⁶

Academic performance alone at any level is not predictive of aptitudes and does not bear a relation with being a caring physician. Tests such as A-level have long-term predictive validity for undergraduate and postgraduate careers.⁷ However, there is evidence that the cause of unsatisfactory doctors and unsatisfactory medical students lies in the non-cognitive rather than the academic domain.⁸ Lower overall satisfaction level with medicine as a career is also associated with those who do not have strong inner motivations.⁹

In our country, students enter the medical profession at an undergraduate level. Performance of Matric, F.sc, and university entrance exam is taken into account to create an overall aggregate, which serves as the basis for entrance into a medical college. Aptitude testing is usually not done in our setting. Most people hold the view that our selection procedure does not get it right as our selection is solely based on selecting the most academically achieved individuals.

We aimed our study to find the aptitude of students currently enrolled in our medical university. Another goal was to determine the future specialty aptitudes of students as very little information is available on this topic.

METHODS

A cross-sectional study was conducted at Faisalabad Medical University which is located in Faisalabad district of province Punjab, Pakistan. University enrolls a batch 350 students each year for training and clinical skills medical graduation designed as MBBS. Allied Hospital (1350 beds), DHQ Teaching Hospital (850 beds) and General Hospital Ghulam Muhammad Abad (300 beds) are the teaching hospitals presently affiliated with this university. Medical graduates of the University get enrolments in various clinical specialties e.g medicine, surgery and allied disciplines. The duration of the study was two months.

By using convenience sampling technique, total number of 238 questionnaires included for data analysis.

1st- year MBBS students on open merit seats who are permanent residents and nationals of Pakistan was included in the study.

Students who were on leave at the time of the study or did not fill the questionnaire completely was excluded from the study.

The questionnaire (supplement) was constructed with 3 parts in addition to a section on demographic details. The two parts were label as Pro Forma A, B and C. Pro Forma A pertained to social determinants underlying career selection and was used for separate research. Pro Forma B was taken from the online source 'Truity',¹⁰ which provides personality and career assessment. Pro Forma C was taken from the online source of 'The DO'.¹¹ The questionnaire was reviewed by faculty members for content. We invited medical students (n=10) from the institution to fill the questionnaire as part of pre-testing and asked them to rate it for general readability and comprehension. Pro Forma B and C obtained from online sources were not modified and included as such. We were not trying to produce a score-able instrument for selection or other purposes.

Demographic details collected include gender, age, seat (open/quota), residence (urban/rural), nationality and merit aggregate (%). Pro Forma B included 60 individual questions and data was obtained using a 5-point Likert scale (ranging from like to dislike). Questions in Pro Forma B were based on Holland Code and Big Five personality systems to assess current career aptitude. Pro Forma C included 11 individual questions related to specialty preference and students had to choose the most suitable option so that prediction regarding their future specialty aptitude could be made.

A session with students was conducted in a lecture hall in which a copy of the questionnaire was distributed amongst the students. Before the survey, we briefed the students about the purpose of the study and cleared any of the queries. No definitions were provided to students rather interpretation was left to the students. Participants were required to complete the paper questionnaire by hand and the filled questionnaires were collected at the end of the session. Participants who missed the contact session were sent questionnaire copies via their class representative. One reminder was sent and those who did not respond were not pursued any further. Only those participants were included which were from Pakistan and had secured a public seat in the college through MDCAT conducted by the University of Health Sciences. Participants from abroad and those on quota seats were excluded.

Out of 350 students enrolled in 1st year at Faisalabad Medical University, 281 completed and handed over the responses (figure 1). The response rate was 80.29%. After excluding non-Pakistani nationals, quota seats, and incomplete forms (n=43), the total number of filled questionnaires included for data analysis was 238.

All statistical analysis for this study was done using SPSS version 26. The data in Pro Forma B was filled online for each individual to get 6 career options most suited according to the individual's personality and aptitude. The total career options were 36. These were divided into 3 separate 'levels' (supplement). 'Level 1' included doctors and dentists. Level 2 included nurses and allied health professionals (the inclusion criteria of allied health professions used was the one specified by ASAHP¹²). 'Level 3' included all non-medical professions. An individual was placed in 'level 1' even if 1 of 6 recommended careers included a doctor or dentist. An individual was placed in 'level 2' even if 1 of 6 recommended careers included nurse or any allied health career. Rest were placed in 'level 3'. 'Level' 1 and 2 were defined as 'having a suitable aptitude' and level 3 was defined as 'not having a suitable aptitude'. The data in Pro Forma C was filled online for each individual. The website predicted the future specialty aptitude of an individual out of 6 specialty options. The frequencies of those having suitable aptitude and not having a suitable aptitude were calculated. The frequencies of predicted specialties were computed.

RESULTS

Mean \pm SD age of participants was 18.95 \pm 1 year. 58% were females (138) & 42% males (100). 79.8% (190) were Urban residents and 20.2% (48) rural residents. (Table 1)

Table 1: Age and Merit characteristics of study participants

Characteristic	Frequency (%)	Maximum	Minimum	Range	Mean	S.D
Age						
17	5 (2.1)	22	17	5	19	1
18	71 (29.8)					
19	101 (42.4)					
20	55 (23.1)					
21	5 (2.1)					
22	1 (0.4)					
Merit						
91.98%-93.83%	228 (95.8)	95.68	91.98	3.70	92.59	0.57
93.84%-95.68%	10 (4.2)					

Table 2: Frequency of suited and unsuited participants according to the study

Category	Level	Frequency (%)
Suited	Level 1	106 (44.5%)
	Level 2	30 (12.6%)
Not suited	Level 3	102 (42.9%)

According to the aptitude analysis by the website 'Truity' which uses the Holland codes system of careers and vocational choice based upon personality type, out of 238 respondents, 44.6% (106) students were labelled as 'level 1', 12.6% (30) students were labelled as 'level 2' and 42.9% (102) students were labelled as 'level 3' (Table 2).

57.1% (136) of students were found to have a suitable aptitude for a medical career in contrast to 42.9% (102) of students who were found to have an aptitude less suited for a medical career. Considering future aptitude, it was found that most students were more suited for a specialty rather than family medicine (Table 3).

The specialty found to be in line with the aptitude of the largest number of students was Internal Medicine (78, 32.8%) and the specialty found to be consistent with the aptitude of the least number of students was Pediatrics (12, 5%). (Figure 3).

Greater numbers of candidates having a suitable medical aptitude were found to be having an aptitude for a specific specialty than candidates not having a suitable medical aptitude (Table 4).

Only 14.7% (20) of candidates who were label as having a suitable medical aptitude were found to have a future aptitude for Family Medicine whereas 24.5% (25) of candidates labelled as not having a suitable medical aptitude were found to have a future aptitude suitable for Family Medicine.

Table 3: Frequency of specialties

No.	Specialty	Frequency (%)
1	Internal Medicine	78 (32.8%)
2	Family Medicine	45 (18.9%)
3	OMM/NMM	35 (14.7%)
4	OB/GYN	31 (13%)
5	Surgery	25 (10.5%)
6	Emergency Medicine	12 (5%)
7	Pediatrics	12 (5%)

Table 4: Specialty results of study participants with suitable and unsuitable aptitudes for medical career

Category	Current Aptitude	Specialty						
		Emergency Medicine	Internal Medicine	OB/ GYN	OMM/ NMM	Pediatrics	Surgery	Family Medicine
		f (%)	f (%)	f (%)	f (%)	f (%)	f (%)	f (%)
Suitable Aptitude	Level 1	4 (3.8)	33 (31.1)	18 (17)	16 (15.1)	6 (5.7)	12 (11.3)	17 (16)
	Level 2	0 (0)	15 (50)	2 (6.7)	6 (20)	0 (0)	4 (13.3)	3 (10)
Not Suitable Aptitude	Level 3	8 (7.8)	30 (29.4)	11 (10.8)	13 (12.7)	6 (5.9)	9 (8.8)	25 (24.5)

Figure 1: The flow of participants in the study

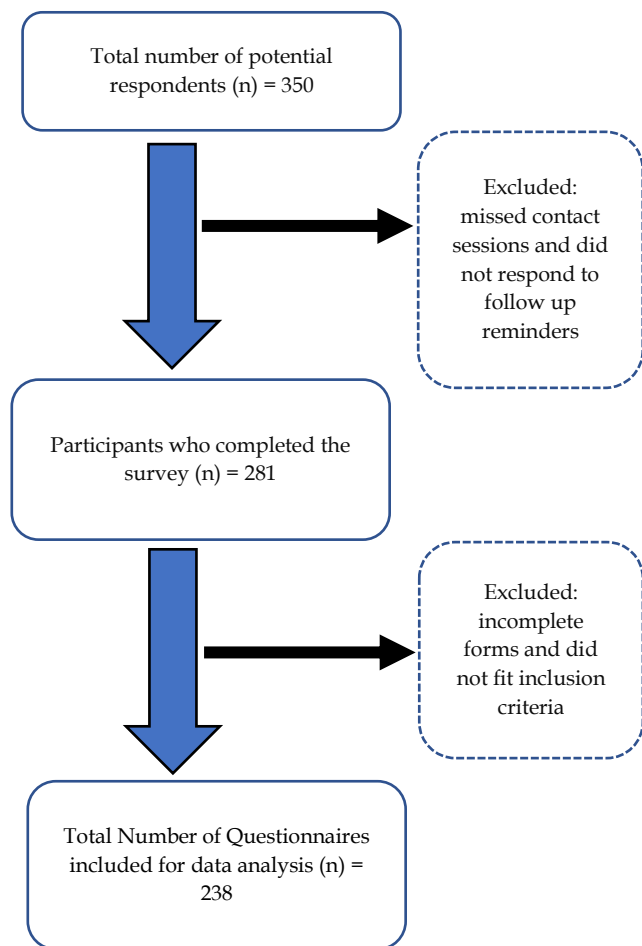


Figure 2: Aptitude of participants according to the study

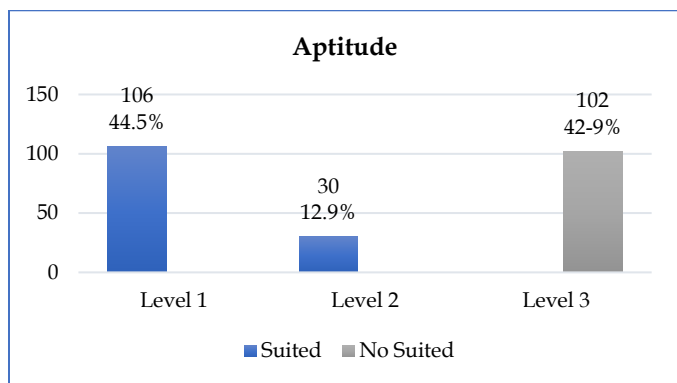
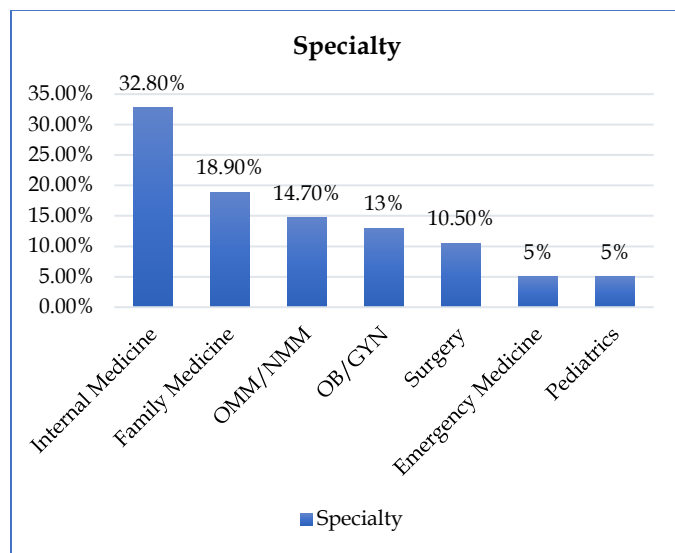


Figure 3: Percentage result of specialties



DISCUSSION

The medical profession demands that those entering it are doing so for the right reasons and aid in helping the ailing humanity. However, many physicians show attitudes that lack empathy and display unacceptable workplace professional behaviors.⁸ Physicians who are dissatisfied with their profession may be less inclined to address health policy issues, embrace charity care, or practice cost containment.¹³ Researchers have indicated problems that can arise when the assessment of motives, personality, and aptitude testing is not included in the selection of medical students.^{8,9,14,15,16} We used Holland Codes and Big Five personality theories to estimate how many currently enrolled students had an aptitude suited for the medical profession. 42.9% (102) of students were found to have an aptitude not suitable for a medical career.

Most students that enter medical school eventually qualify and have successful careers. However, some show a range of problems as evidenced by the fact that many fail during their courses, have motivational problems, face professional burnout¹⁷, exhibit signs of depression¹⁸, drop out to opt for another career, or have low levels of long term satisfaction.^{8,9} A perspective is brought into the discussion that these issues might be related to personality, and non-suitable aptitudes and that

interventional programs at institutional levels are needed to support those with a less suitable aptitude for the medical profession but are currently enrolled here.

42.9% (102) of the students not having suitable aptitude demands that we need to revisit our selection procedures and assume a more multi-dimensional approach.^{4, 5, 6, 7, 8} Our study adds to the discussion of the need for testing of cognitive skills, communication skills, interpersonal understanding, and personality for determining proper aptitude in addition to academic performance. However, addressing motives in the student selection is not easy as currently there is a lack of a suitable selection tool.

Different fields and specialties in medicine demand different characteristics and a personality and aptitude suited to that specialty. Most medical students prefer specialization even at the time of joining MBBS and their preference at the time they begin medical school is significantly associated with their ultimate choice.¹⁹ These preferences become more diverse in the later stage of studies.²⁰ We anticipated that students might not be aware of the available specialties at the time of the survey so we did not include a question about which specialty they would want to pursue rather their aptitude among the 6 specialties was estimated. Literature from other countries shows a declining trend of preferring family medicine.^{18, 19} Our findings supported this with the bulk of students having an aptitude for a particular specialty. However, a greater number of students in the cohort with a less suitable aptitude for a medical career were found suitable for family medicine. Keeping in view the changing demography of the medical profession, the latest information concerning the career choices of medical students and that majority of students would prefer to work after specialization, workforce planning is a central issue in providing quality healthcare to all and to prevent an oversupply of doctors in certain specialties and prevent undersupply of family medicine practitioners.

CONCLUSION

A potential new understanding of the relation between local cultural and societal factors to aptitude is needed to devise a better selection procedure for correct allocation of our limited resources to the more suitable and highly motivated students.

LIMITATIONS

It needs to be acknowledged that when respondents self-report on questionnaires they might fill the questionnaires a bit differently as some answers might be more socially acceptable than others, thus serving as a source of bias. Limitations of this study are that this was conducted in only one medical college and the findings may not be able to be generalized. Studies from other

colleges across the county are needed to make generalizations. It must also be acknowledged that internet tools were utilized and people with certain traits may tend to gravitate toward specific aptitudes but that doesn't mean a person won't excel in this field.

SUGGESTIONS / RECOMMENDATIONS

Our study provides a basis for robust longitudinal studies that are needed to follow aptitude trends. It would also be worthwhile to investigate what specialties students choose and what changes in specialty trends take place with time.

CONFLICT OF INTEREST / DISCLOSURE

The authors have no conflicts of interest to declare.

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