

# Frequency and Comparison of Personality Types of Pre-Medical and First-Year Medical Students in Choosing Medicine as a Career Choice and its Association with the Education System and Socioeconomic Status

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## ABSTRACT

**Objective:** To determine the frequency and compare personality types among pre-medical and first-year medical students and their relation to the education system and socioeconomic status.

**Study Design:** Comparative cross-sectional study.

**Place and Duration of Study:** Ayub Medical College, Abbottabad and three Secondary-Level Institutes of Abbottabad, Pakistan, from Jan to Mar 2020.

**Methodology:** Of 384 students, 192 were each included in pre-medical and first-year medical groups. After obtaining written informed consent, data was collected on a questionnaire based on the Myers-Briggs Type Indicator. Socioeconomic status was assessed using a modified Kuppuswamy scale.

**Results:** Common personality types among pre-medical students were extrovert-intuitive-feeling-perceiving 33(17.2%), extrovert-intuitive-feeling-judging 22(11.5%), and introvert-intuitive-feeling-judging 19(9.89%), while among medical students, common types were extrovert-intuitive-feeling-perceiving 34(17.7%), extrovert-intuitive-feeling-judging 25(13%), introvert-intuitive-feeling-perceiving 21(10.9%) and extrovert-sensing-feeling-judging 21(10.9%). Pre-medical and medical students have attitude preferences towards extroverts, intuitive, feeling, and perceiving. A greater inclination for feeling was found among medical students than pre-medical and for perceiving among pre-medical students than medical. For paired personality preferences, both groups have expressed a predilection for intuitive feeling and feeling perceiving. Comparison between groups was statistically insignificant ( $p=0.788$ ). There was a statistically insignificant difference between personality types with the education system in the pre-medical ( $p=0.058$ ) and medical group ( $p=0.916$ ) and with socioeconomic status in the pre-medical ( $p=0.146$ ) and medical group ( $p=0.931$ ).

**Conclusion:** Pre-medical and medical students shared similar personalities. Identifying personalities at the pre-medical level is important so medical students find synchronisation between their personalities and studies. Socioeconomic status should also be considered.

**Keywords:** Myers-Briggs Type Indicator, Medical Students, Personality Trait.

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## INTRODUCTION

Everyone is marked with a different personality type, and this understanding helps determine one's educational and professional career preferences. Unfortunately, most educational institutions in Pakistan do not provide students with career counselling according to their personality types.<sup>1</sup> Though research in health professions education supported non-cognitive factors such as personality to consider while selecting and training students, admissions are still practised simply on a cognitive basis.<sup>2,3</sup> As a result, students have to face numerous challenges to fit into their chosen field. Students are often pressured by their

parents to try to get into medicine. Some of them opt for it without having any vision, and such are the students who remain undecided after graduation about making a speciality choice.<sup>4</sup> When pre-medical students get into medical institutes and find no coherence among course structure, teaching patterns and personality types, they end up with poor academic performance and mental health problems and often drop out of college.<sup>5</sup>

Therefore, to bring forth competent doctors in society, students should be evaluated for their personality traits at all three levels of education: primary, secondary and graduate.<sup>6</sup> There are many tools for personality typing, but the Myers-Briggs Type Indicator (MBTI) is one of the most effective, valid, and reliable tools for medical and other professions. MBTI

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identifies four dichotomies that are Extrovert(E) versus Introvert(I), Sensing(S) versus Intuitive(N), Thinking(T) versus Feeling(F) and Judging(J) versus Perceiving(P). Based on these dichotomies, MBTI has classified 16 different types of personality.<sup>7,8</sup>

In Pakistan, using MBTI for personality typing is new, and little literature is available on this topic. In Pakistan, no study has focused on the personality typing of pre-medical and medical students using the MBTI questionnaire, which compared personality types with the education system and socioeconomic status.<sup>9</sup> The current study aims to focus on personality typing at a pre-medical level that serves to help students at an earlier stage to identify and understand their inclination towards medicine according to their personality type and to find out its association with the education system and socioeconomic status. This will help the students to progress in their medical careers with greater zeal and strength. The objectives of this study were to determine and compare the frequency of personality types between pre-medical and first-year medical students in accordance with the medical profession as their career choice and to find out the association of their personality types with the education system and with the socioeconomic status of the student's parents. This will help decrease the frequency of career dissatisfaction and/or choice of the wrong career among these students.

## METHODOLOGY

The comparative cross-sectional study was conducted at Iqra Academy Abbottabad, Government Boys Postgraduate College Abbottabad, and Government Girls Postgraduate College Abbottabad, and Ayub Medical College, Abbottabad Pakistan, from January to March 2020, after obtaining approval from the Medical Ethics Committee. Sample size was estimated through the WHO sample size calculator, taking the anticipated population proportion of pre-medical and first-year medical students as 50%.<sup>10</sup>

**Inclusion Criteria:** The study included pre-medical and first-year medical students of either gender aged 16-23 years.

**Exclusion Criteria:** Absent Students, those who were on antipsychotic drugs, and those who completed incomplete questionnaires were excluded.

Of the 384 students, 192 were selected in pre-medical and first-year medical groups using a convenience sampling technique.

The study was conducted at Iqra Academy Abbottabad, Government Boys Postgraduate College

Abbottabad, and Government Girls Postgraduate College Abbottabad, comprising pre-medical students and Ayub Medical College, Abbottabad Pakistan, comprising first-year medical students. Iqra Academy is a private secondary-level institute; the rest are all public.

A structured self-administered questionnaire was introduced to the students after explaining the purpose of the study and taking verbal and written informed consent from them. The questionnaire had two parts. The first part consisted of written informed consent and demographic details of participants, such as name, age, gender, class, institution name, and education system (studied in whether FSc or A-Levels) and 20 prompts with either option (a) or (b) based on MBTI eight personality preferences. Students were asked to choose only one option that best described their personality. The second part contained a Myers-Briggs score sheet (Table-I).

The socioeconomic status of the head of the family was also assessed by using the modified Kuppuswamy scale<sup>11,12</sup> by asking about educational level, occupation and family income per month after converting into Pakistani Rupees and then scored into the respective socioeconomic class of Upper(26-29), Upper Middle(16-25), Lower Middle(11-15), Upper Lower(05-10), and Lower(<5) class.

Data was analysed using Statistical Package for the Social Sciences (SPSS) version 23.00. Quantitative variables were expressed as Mean±SD and qualitative variables were expressed as frequency and percentages. Chi-square test was applied to explore the inferential statistics. The *p*-value lower than or up to 0.05 was considered as significant.

## RESULTS

There were 192 students in pre-medical and first-year medical groups among 384 participants. The mean age was 18.56±1.166 years. There were 206(53.6%) male and 178(46.4%) female students. Among MBTI four dimensions, each showed varying statistics. Dimension of the flow of energy showed more extroverts (E) 234(60.9%) than introverts (I) 150(39.1%). The dimensions of information-gathering showed more intuitive (N) type 240(62.5%) than sensing (S) type 144(37.5%). The decision-making dimensions showed more feeling (F) type 293(76.3%) than thinking (T) type 91(23.7%). Dimension of complexity preference demonstrated more perceiving (P) type 212(55.2%) than judging (J) type 172(44.8%). Common paired attitudes came out to be in the

Personality Types of Students in Choosing Medicine as a Career

following descending order: NF 190(49.5%) >FP 161(41.9%) >EN 147(38.3%). Of all attitude and function preferences, students with sensing (S) and thinking (T) types were in the lowest number. The above findings are evident in Table-II.

Table-I Myer Briggs Score Sheet

Option A	Option B
Extroverts	Introverts
Expend energy, enjoy groups	Conserve energy, enjoy one-on-one
More outgoing, think out loud	More reserved, think to yourself
Seek many tasks, public activities, interaction with others	Seek private, solitary activities with quiet to concentrate
External, communicative, express yourself	Internal, reticent, keep to yourself
Active, initiate	Reflective, deliberate
Sensing	Intuitive
Interpret literally	Look for meaning and possibilities
Practical, realistic, experiential	Imaginative, innovative, theoretical
Standard, usual, conventional	Different, novel, unique
Focus on here-and-now	Look to the future, global perspective, "big picture"
Facts, things, "what is"	Ideas, dreams, "what could be," philosophical
Thinking	Feeling
Logical, thinking, questioning	Empathetic, feeling, accommodating
Candid, straight forward, frank	Tactful, kind, encouraging
Firm, tend to criticize, hold the line	Gentle, tend to appreciate, conciliate
Tough-minded, just	Tender-hearted, merciful
Matter of fact, issue-oriented	Sensitive, people-oriented, compassionate
Judging	Perceiving
Organized, orderly	Flexible, adaptable
Plan, schedule	Unplanned, spontaneous
Regulated, structured	Easygoing, "live" and "let live"
Preparation, plan ahead	Go with the flow, adapt as you go
Control, govern	Latitude, freedom

The frequencies of individual personality types were found almost similar between pre-medical and medical groups. The difference in personality types between pre-medical and medical groups was statistically insignificant ( $p=0.788$ ) (Table-III).

Table-II Individual and Paired Attitude Preferences Between Pre-medical and First year Medical Students (n=384)

Individual And Paired Personality Types (Attitude Preference)	Classes		Total (Premedical and First Year Medical Students) (n=384) n(%)
	PreMedical Students (n=192) n(%)	Medical Students (n=192) n(%)	
E (Extrovert)	118(61.4)	116(60.4)	234(60.9)
I (Introvert)	74(38.5)	76(39.5)	150(39.1)
S (Sensing)	73(38.0)	71(36.9)	144(37.5)
N (Intuitive)	119(61.9)	121(63.0)	240(62.5)
T (Thinking)	54(28.1)	37(19.2)	91(23.7)
F (Feeling)	138(71.8)	155(80.7)	293(76.3)
J (Judging)	79(41.1)	93(48.4)	172(44.8)
P (Perceiving)	113(58.8)	99(51.5)	212(55.2)
IJ (Introvert Judging)	35(18.2)	38(19.7)	73(19.0)
IP (Introvert Perceiving)	39(20.3)	34(17.7)	73(19.0)
EP (Extrovert Perceiving)	74(38.5)	65(33.8)	139(36.2)
EJ (Extrovert Judging)	44(22.9)	55(28.6)	99(25.8)
TJ (Thinking Judging)	21(10.9)	18(9.3)	39(10.2)
TP (Thinking Perceiving)	32(16.6)	18(9.3)	50(13)
FP (Feeling Perceiving)	80(41.6)	81(42.1)	161(41.9)
FJ (Feeling Judging)	59(30.7)	75(39.0)	134(34.9)
IN (Introvert Intuitive)	44(22.9)	48(25)	92(24.0)
EN (Extrovert Intuitive)	75(39.0)	72(37.5)	147(38.3)
IS (Introvert Sensing)	30(15.6)	28(14.5)	58(15.1)
ES (Extrovert Sensing)	43(22.3)	44(22.9)	87(22.6)
ST (Sensing Thinking)	26(13.5)	15(7.8)	41(10.7)
SF (Sensing Feeling)	47(24.4)	56(29.1)	103(26.8)
NF (Intuitive Feeling)	91(47.3)	99(51.5)	190(49.5)
NT (Intuitive Thinking)	28(14.5)	22(11.4)	50(13.0)
SJ (Sensing Judging)	30(15.6)	39(20.3)	69(18.0)
SP (Sensing Perceiving)	43(22.3)	32(16.6)	75(19.5)
NP (Intuitive Perceiving)	70(36.4)	67(34.8)	137(35.7)
NJ (Intuitive Judging)	49(25.5)	54(28.1)	103(26.8)

Table-III: Frequencies of Personality Types (n=384)

Personality Types		SENSING TYPES [n (%)]		INTUITIVE TYPES [n (%)]		p-value		
		Thinking (T)	Feeling (F)	Feeling (F)	Thinking (T)			
INTROVERTS TYPES (I) N (%)	JUDGING (J)	ISTJ (Introvert-Sensing-Thinking-Judging)	ISFJ (Introvert-Sensing-Feeling-Judging)	INFJ (Introvert-Intuitive-Feeling-Judging)	INTJ (Introvert-Intuitive-Thinking-Judging)	p=0.938		
		Pre-medical=5(2.6%)	Pre-medical=7(3.64%)	Premedical=19(9.89%)	Pre-medical=5(2.6%)			
		Medical=5(2.6%)	Medical=10(5.2%)	Medical=19(9.89%)	Medical=5(2.6%)			
	Total=10(2.6%)		Total=17(4.43%)		Total=38(9.89%)		Total=10(2.6%)	
	PERCEIVING (P)	ISTP (Introvert-Sensing-Thinking-Perceiving)	ISFP (Introvert-Sensing-Feeling-Perceiving)	INFP (Introvert-Intuitive-Feeling-Perceiving)	INTP (Introvert-Intuitive-Thinking-Perceiving)	p=0.705		
		Pre-medical=5(2.6%)	Premedical=13(6.77%)	Premedical=17(8.85%)	Premedical=4(2.08)			
Medical=3(1.56%)		Medical=10(5.2%)	Medical=21(10.9%)	Medical=3(1.56%)				
Total=8(2.08%)		Total=23(5.98%)		Total=38(9.89%)		Total=7(1.82%)		
EXTROVERTS TYPES (E) N (%)	PERCEIVING (P)	ESTP (Extrovert-Sensing-Thinking-Perceiving)	ESFP (Extrovert-Sensing-Feeling-Perceiving)	ENFP (Extrovert-Intuitive-Feeling-Perceiving)	ENTP (Extrovert-Intuitive-Thinking-Perceiving)	p=0.543		
		Pre-medical=9(4.6%)	Premedical=16(8.33%)	Premedical=33(17.2%)	Premedical=15(7.8%)			
		Medical=4(2.08%)	Medical=15(7.81%)	Medical=34(17.7%)	Medical=9(4.68%)			
	Total=12(3.12%)		Total=31(8.07%)		Total=67(17.4%)		Total=24(6.25%)	
	JUDGING (J)	ESTJ (Extrovert-Sensing-Thinking-Judging)	ESFJ (Extrovert-Sensing-Feeling-Judging)	ENFJ (Extrovert-Intuitive-Feeling-Judging)	ENTJ (Extrovert-Intuitive-Thinking-Judging)	p=0.256		
		Premedical=7(3.64%)	Premedical=11(5.72%)	Premedical=22(11.5%)	Premedical=4(2.08)			
Medical=3(1.56%)		Medical=21(10.9%)	Medical=25(13%)	Medical=5(2.6%)				
Total=10(2.6%)		Total=32(8.33%)		Total=47(12.2%)		Total=9(2.34%)		
p-value		p=0.802	p=0.345	p=0.962	p=0.789			
Pre-medical and medical groups comparative p-value=0.788								

The frequencies and percentages of the FSc education system in pre-medical and first-year medical students were 138(71.8%) and 181(94.2%), respectively. The frequencies and percentages of the Levels of the education system in pre-medical and first-year medical students were 54(28.1%) and 11(5.7%), respectively. There was a statistically insignificant difference between personality types and the education system in the pre-medical ( $p=0.058$ ) and first-year-medical students ( $p=0.916$ ) (Table-IV).

The frequencies and percentages of upper social class in pre-medical and 1<sup>st</sup>-year medical students were 22(11.4%) and 22(11.4%), respectively. The frequencies and percentages of upper middle social class pre-medical and 1<sup>st</sup>-year medical students were 53(27.6%) and 64(33.3%), respectively. The frequencies and percentages of lower middle social class in pre-medical and 1<sup>st</sup>-year medical students were 73(38%) and 86(44.7%), respectively. The frequencies and percentages of upper-lower social class in pre-medical and 1<sup>st</sup>-year medical students

were 36(18.7%) and 15(7.8%), respectively. The frequencies and percentages of lower social class in pre-medical and 1<sup>st</sup>-year medical students were 8(4.16%) and 5(2.6%), respectively. There was a statistically insignificant difference between personality types and socioeconomic status in the pre-medical students ( $p=0.146$ ) and 1<sup>st</sup>-year medical students ( $p=0.931$ ) (Table-V).

### DISCUSSION

Personality typing is important to perform in students for their satisfaction with medicine as a career choice. The present study showed no significant difference in personality types between pre-medical and first-year medical students. There were more extroverts, perceivers and students with feeling type compared to introverts, judging, and thinking. Extroverts enjoy group discussions; perceivers are easygoing, while the feeling type considers values and harmony. These findings are consistent with Jafrani *et al.* work on the choice of

medical speciality among Karachi students.<sup>11</sup> However, in the present study, the intuitive type was more than the sensing one. Students of the intuitive type rely on their insights to carry out their tasks. Saleem *et al.* found the same result in study on summer science research students.<sup>12</sup> On the other hand, Fan *et al.*<sup>13</sup> Tharp *et al.*<sup>14</sup> and Jiloha *et al.*<sup>15</sup> found high-achievement students to be more introverts, judging, sensing and thinking type, in physiology and pharmacy courses, respectively, which is in contrast to the current study. Introverts prefer individual work, judging types are more organised in their study habits, sensing types favour operating on facts and concrete details, while thinking types have logical and reasoning skills.

**Table-IV Association Between Personality Types and Educational System Among Pre-Medical and Medical Students (n=384)**

Personality Types	Education System Pre-Medical Students (n=192)		p-value	
	FSc, n(%)	A Levels n(%)		
ESTJ	3(1.6)	4(2.1)	0.058	
ESTP	4(2.1)	5(2.6)		
ESFJ	9(4.6)	2(1.04)		
ESFP	14(7.3)	2(1.04)		
ENTP	11(5.7)	4(2.1)		
ENTJ	3(1.6)	1(0.52)		
ENFP	25(13)	8(4.1)		
ENFJ	13(6.8)	9(4.6)		
ISTJ	2(1.04)	3(1.6)		
ISTP	2(1.04)	3(1.6)		
ISFJ	5(2.6)	2(1.04)		
ISFP	9(4.6)	4(2.1)		
INTJ	3(1.5)	2(1.04)		
INTP	4(2.1)	0(0)		
INFP	17(8.8)	0(0)		
INFJ	14(7.2)	5(2.6)		
<b>Medical Students (n=192)</b>				0.916
ESTJ	3(1.6)	0(0%)		
ESTP	4(2.1)	0(0)		
ESFJ	19(9.8)	2(1.04)		
ESFP	14(7.3)	1(0.52)		
ENTP	9(4.6)	0(0)		
ENTJ	5(2.6)	0(0)		
ENFP	31 (16)	3(1.6)		
ENFJ	24(12.5)	1(0.52)		
ISTJ	4(2.1)	1(0.52)		
ISTP	3(1.6)	0(0)		
ISFJ	9(4.6)	1(0.52)		
ISFP	10(5.2)	0(0)		
INTJ	5(2.6)	0(0)		
INTP	3(1.6)	0(0)		
INFP	21(10.9)	0(0)		
INFJ	17(8.8)	2(1.04)		

**Table-V: Association Between Personality Types and Socioeconomic Status Among Pre-Medical and Medical Students (n=384)**

	Socioeconomic Status of Premedical Students (n=192)					p-value	
	Upper Class (N) (%)	Upper Middle Class (n)(%)	Lower Middle Class (n)(%)	Upper Lower Class (n)(%)	Lower Class (n) (%)		
ESTJ	1(0.5)	6(3.1)	0(0)	0(0)	0(0)	0.058	
ESTP	3(1.6)	3(1.6)	2(1.04)	1(0.5)	0(0)		
ESFJ	1(0.5)	3(1.6)	4(2.1)	1(0.5)	2(1.04)		
ESFP	2(1.04)	3(1.6)	5(2.6)	4(2.1)	5(2.6)		
ENTP	2(1.04)	4(2.1)	8(4.16)	0(0)	1(0.5)		
ENTJ	0(0)	1(0.5)	3(1.6)	0(0)	0(0)		
ENFP	4(2.1)	6(3.12)	14(7.3)	9(4.7)	0(0)		
ENFJ	3(1.6)	8(4.16)	7(3.64)	4(2.1)	0(0)		
ISTJ	1(0.5)	3(1.6)	0(0)	1(0.5)	0(0)		
ISTP	0(0)	3(1.6)	0(0)	2(1.04)	0(0)		
ISFJ	0(0)	2(1.04)	4(2.1)	1(0.5)	0(0)		
ISFP	1(0.5)	4(2.1)	6(3.12)	2(1.04)	0(0)		
INTJ	0(0)	3(1.6)	1(0.5)	1(0.5)	0(0)		
INTP	1(0.5)	0(0)	1(0.5)	2(1.04)	0(0)		
INFP	0(0)	1(0.5)	10(5.2)	5(2.6)	1(0.5)		
INFJ	3(1.6)	3(1.6)	8(4.16)	3(1.6)	2(1.04)		
<b>Socioeconomic Status of Medical Students (n=192)</b>							0.916
ESTJ	0(0)	1(0.5)	2(1.04)	0(0)	0(0)		
ESTP	0(0)	0(0)	4(2.1)	0(0)	0(0)		
ESFJ	2(1.04)	5(2.6)	13(6.8)	0(0)	1(0.5)		
ESFP	1(0.5)	5(2.6)	6(3.12)	2(1.04)	1(0.5)		
ENTP	1(0.5)	1(0.5)	5(2.6)	1(0.5)	1(0.5)		
ENTJ	1(0.5)	1(0.5)	3(1.6)	0(0)	0(0)		
ENFP	5(2.6)	13(6.8)	15(7.8)	1(0.5)	0(0)		
ENFJ	3(1.6)	7(3.64)	11(5.7)	4(2.1)	0(0)		
ISTJ	2(1.04)	2(1.04)	1(0.5)	0(0)	0(0)		
ISTP	0(0)	2(1.04)	1(0.5)	0(0)	0(0)		
ISFJ	2(1.04)	4(2.1)	3(1.6)	1(0.5)	0(0)		
ISFP	0(0)	5(2.6)	5(2.6)	0(0)	0(0)		
INTJ	0(0)	2(1.04)	2(1.04)	1(0.5)	0(0)		
INTP	0(0)	2(1.04)	1(0.5)	0(0)	0(0)		
INFP	2(1.04)	7(3.6)	7(3.6)	3(1.6)	2(1.04)		
INFJ	3(1.6)	7(3.6)	7(3.6)	2(1.04)	0(0)		

In this study, the most common paired combinations of attitude preferences in ascending order were NF >FP >EN, and the most common personality type was ENFP. ENFP was also the most common type in the study conducted by Kulkarni *et al.*<sup>16</sup> on first-year medical students of Belgaum, India. In contrast to this study, a study by Jessee *et al.*<sup>17</sup> showed SJ> ST >IS and ISTJ, ESFJ, ESTJ and ISFJ as the most common types in matching personality types with learning preferences. Similarly, studies by Melear *et al.*<sup>18</sup> and Tharp *et al.*<sup>14</sup> found EP students to be low achievers. Chang *et al.*<sup>19</sup> found ESTJ, INTP and ISFJ to

be the most predominant types. A study carried out by Syakurah *et al.*<sup>20</sup> at the University of Texas showed that the INFJ, ISFP, ENFJ, ESFJ and ESFP personalities were more inclined towards choosing medicine as a career.

Though all the personality types are of equal importance at their place, there are factors like learning environment, teaching styles of teachers, students' background, and course structure favouring one type over another. There is no denying the fact that every student prefers one of the four dichotomies presented by MBTI, but everyone still uses all eight preferences every day.<sup>21</sup>

The strengths of this study were that it was a comparative cross-sectional study and that MBTI is a standardised personality test used in this study. This study determined personality types at the pre-medical level, unlike other studies focusing on determining them only among medical students. This study had some limitations, too. MBTI topic is novel, and there needed to be more literature that could otherwise help find consistency with the study objectives and analyse the study outcomes.

### LIMITATION OF STUDY

Because of convenience sampling, the results were not generalizable. Data collection was difficult for pre-medical students during this period in Abbottabad due to winter vacations and examination preparation leaves. There may be information bias because a self-administered technique was used for data collection. In this study, private medical institutes were not considered.

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### CONCLUSION

Pre-medical and medical students shared similar personalities. Identifying personalities at the pre-medical level is important so medical students find synchronisation between their personalities and studies. Socioeconomic status should also be considered.

**Conflict of Interest:** None.

### Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

AR & AS: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

NSK & AR: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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## Personality Types of Students in Choosing Medicine as a Career

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