

ORIGINAL ARTICLE

Career Choices: Are you the chosen one or the free will really exist?

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ABSTRACT:

Scientists think they can prove that free will is an illusion. Philosophers are urging them to think again. Choosing a medical specialty can be a complicated decision for a medical student to make. Various factors seem to influence the choice: gender, economic status, guardian occupation, and personality traits.

The survey included questions about the socio-demographic details like age, gender, year of education in medical school, choice of specialty and score of five personality traits as assessed by Big five inventory (1) Extroversion (2) Agreeableness (3) Neuroticism (4) Openness (5) Conscientiousness.

A total of 223 participants were included in the study which included 85/223 (38.1%) males and 138/223 (61.9%) females. The ages of participants ranged from 18 to 35 with a mean of 21 years. Most participants (146/223 = 65%) fell in the age group of 21 to 30 years. A nearly equal

number of participants were included from each year of MBBS 44(19.7%) from the first year, 47(21.1%) from the second year, 36(16.1%) from the third year, 38(17.0%) from the fourth year, 47(21.1%) from final year and among graduates 11(4.9%) were doing their internship.

There is no significant association between personality traits and a person's choice of specialty. More powered studies with inclusion of more possible explanatory variables are required to create a better fitting prediction model in this regard. There is nevertheless an association between the choice of Family Medicine and Public Health as a group who scored more in extroversion, openness, neuroticism and less on conscientiousness.

KEYWORDS

Personality traits, Career choices, Medical students, Pakistan

INTRODUCTION

Scientists think they can prove that free will is an illusion. Philosophers are urging them to think again. According to the latest findings of neuroscience about how and when we make “decisions,” and how that bears on philosophical issues of free will, there has been a discovery that a pattern of brain activity seems to predict that decision by as many as seven seconds.⁽¹⁾ Long before the subjects were even aware of making a choice, it seems, their brains had already decided. As humans, we like to think that our decisions are under our conscious control — that we have free will. But how can the will be ours if we do not even know when it occurred and what it had decided?

Choosing a medical specialty can be a complicated decision for a medical student to make. Various factors seem to influence the choice: gender, economic status, guardian occupation, and personality traits. Therefore

a study is needed to establish the correlation between these factors and career choice.

Medical education in Pakistan is based on a five-year-long bachelor's degree and twelve months of internship before one can opt for training in a particular medical specialty. Among the top, selected specialties are General Surgery, Internal Medicine and other sub-specialties i.e. Pediatrics, Dermatology, Obstetrics/ Gynecology in descending order. More than 70% of students chose these fields based on personality traits, time commitments, respect/ prestige, and international opportunities.⁽²⁾ Timings of choosing a medical specialty are under review, however, many students think it is too early for them to choose the medical field of interest and research shows that many students eventually changed their choice from the one they originally preferred in Medical school.^(3,4)

It is quite evident that some specialties are more stressful than others. An Individual's personality is a strong indicator of coping with stressful situations. The personality model most commonly used is the Big Five Inventory personality traits which encompass openness, conscientiousness, extroversion, agreeableness, and neuroticism.⁽⁵⁾ A recent review of the literature shows adaptive traits, as expected, to be more effective in coping with stressful conditions.⁽⁶⁾

According to College of Physicians and Surgeons Pakistan recent statistics report, there are 151852 registered medical practitioners, out of them, 35007 are working as specialists after doing their MBBS. In Pakistan, students have to choose medicine as a career choice after completion of their higher secondary school certification (12th standard). After getting selected in a medical school, they complete five years of medical education and are given an MBBS degree upon completion. The next step is to complete their house job of one year and then choose from a plethora of choices within the medical field as a career choice. Upon selecting Medicine and Allied or Surgery and allied as career choices they are then faced with a further selection of subspecialty choices. At every step, many factors play an important role in helping them decide the chosen specialty.

The study aims to determine the correlation between career choices and personality traits of medical students and interns and to counsel regarding the medical career of people with personality traits as well as to warn about a particular field which is going to be short of doctors in future considering decline in students and interns with personality which choose that particular field.

METHODOLOGY

This was an exploratory survey conducted among 223 medical students with non-probability convenience sampling at a medical school attached to a tertiary care hospital in Islamabad, Pakistan. The data was collected over 1 month from April- May 2016. Students were asked to make a selection regarding their future specialty choice and the personality traits of the respondents were scored using the Big Five Inventory (BFI) personality assessment tool.

They were given an open choice to select all available specialties in Pakistan and abroad. The preferred specialties included medical specialties, surgical specialties, general practice, pediatrics, anesthesia, and intensive care medicine, gynecology, psychiatry, dermatology, endocrinology, genetics, oncology, basic sciences, medical education, pathology, radiology, research, forensic medicine, community medicine, and public health.

The data was collected using a questionnaire that was to be filled by the participant and returned to the investiga-

tor. The participants were told in advance of filling about the nature and design of the study and the confidential nature of their data. They were also given a choice whether to respond to a question or not. The questionnaire was written in the English language and validated among 10 students for understanding before using it in a larger population. Informed consent was taken.

The survey included questions about the socio-demographic details like age, gender and location of the participant. The questionnaire also included a year of education in medical school, level of education of their parents, their first choice of specialty and scored of extroversion, agreeableness, neuroticism, openness, and conscientiousness as in the Big five inventory.

The questionnaire was pre-tested on 25 medical students from each of the medical school years and interns in the medical college to determine the response and applicability of the tool. Changes were made accordingly (Unpublished Data set not included in this survey).

The Big Five Inventory (BFI) is a self-report inventory designed to measure the Big Five dimensions. It is quite brief for a multidimensional personality inventory (44 items total) and consists of short phrases with relatively accessible vocabulary.⁽⁵⁾ The survey items were selected by two authors based on the recent literature review on career choices made by medical students and what influences these choices.

Statistical analysis was done using SPSS version 23. Results were presented as means and interquartile ranges for continuous variables. Multinomial regression analysis was performed with age, sex, year of education and personality traits as predictors and choice of specialty was taken as the response variable. All tests used two-tailed with an alpha of 0.05.

RESULTS

A total of 223 participants were included in the study which included 85/223 (38.1%) males and 138/223 (61.9%) females. The ages of participants ranged from 18 to 35 with a mean of 21 years. Most participants (146/223 = 65%) fell in the age group of 21 to 30 years. A nearly equal number of participants were included from each year of MBBS 44 (19.7%) from the first year, 47 (21.1%) from the second year, 36 (16.1%) from the third year, 38 (17.0%) from the fourth year, 47 (21.1%) from final year and among graduates 11 (4.9%) who were doing their internship.

Some of the interesting gender differences which were observed between genders showed females ($p=0.008$) to have higher neuroticism scores when compared to male medical students as shown in Figure 1.

Personality trait scores were collected from each of the 223 participants which showed a near-normal distribution in each of the five traits. Under the grouped specialties of interest; 104 (46.6%) participants chose Medicine and allied, 65(29.1%) chose surgery and allied, 17 (7.6%) chose pediatrics, 11 (4.9%) chose psychiatry, 10 (4.5%) participants chose basic sciences, 10 (4.5%) chose obstetrics and gynecology, 4 (1.8%) chose radiology, and

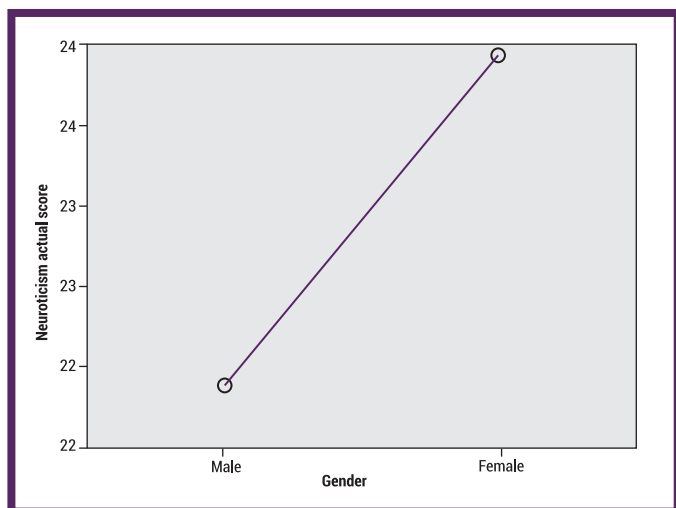


Figure 1. Relationship of neuroticism with gender.

2(0.9%) chose others as shown in (Figure 2).

Multinomial regression analysis as shown in (Table 2) was performed taking age, sex, year of graduation and personality traits as predictors while the choice of specialty was taken to be the response variable. The analysis showed insignificance for the model fitness and significance for the goodness of fit. The model itself showed no significant associations between any of the predictors and

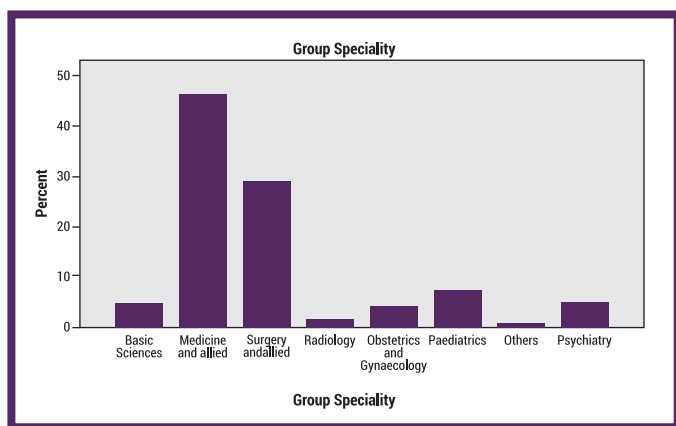


Figure 2. Percentage of Career choices among Grouped specialties.

the choice of specialty. A similar multinomial analysis using an arithmetic average of all personality traits and log of the product of all personality traits as predictor variables also showed no significant association with the

choice of specialty. This analysis aimed to compute a single variable from all the individual personality traits and see its association in total with a choice of specialty. Moreover, binomial regression analysis with the same predictor variables for each of the specialty choices (Medicine, Surgery, Cardiology, Neurology, and Psychiatry) also showed insignificant results.

The most frequent single choice was Internal Medicine 30/223 (13.5%) followed by General Surgery 27/223 (12.1%) and Cardiology 24/223 (10.8%). Fields like Community Medicine, Medical Education, Endocrinology, Genetics, and Nutritionist were chosen by a single participant only (0.4%) as shown in Table 1.

Specialties	Frequency & Percentage (%) N=223
Internal Medicine	30 (13.5%)
Surgery	27 (12.1%)
Cardiology	24 (10.8%)
Pediatrics	17 (7.6%)
Dermatology	16 (7.2%)
Neurology	13 (5.8%)
Ophthalmology	13 (5.8%)
Psychiatry	11 (4.9%)
Gynecology	10 (4.5%)
Gastroenterology	8 (3.6%)
Orthopedics	7 (3.1%)
Plastic Surgery	6 (2.7%)
Pathology	5 (2.2%)
Cardiothoracic Surgery	4 (1.8%)
Radiology	4 (1.8%)
Anesthesiology	4 (1.8%)
Family Medicine	3 (1.3%)
Neurosurgery	3 (1.3%)
Oncology	3 (1.3%)
Pulmonology	3 (1.3%)
Public Health	2 (0.9%)
Research	2 (0.9%)
Emergency Medicine	1 (0.4%)
Endocrinology	1 (0.4%)
Forensic Medicine	1 (0.4%)
Genetics	1 (0.4%)
Nutritionist	1 (0.4%)
Surgical Oncology	1 (0.4%)
Community Medicine	1 (0.4%)
Educationist	1 (0.4%)

Table 1. Frequency of Medical Specialty choices by Medical student and Interns

When a specialty choice was treated as a predictor for a specific personality trait, some interesting results were obtained. In these linear models, even though the information criterion (AIC) was high (829) suggesting a low accuracy (17.4%), specialty choice was the single most important predictor having a significant association with all of the five personality traits. People who choose Family Medicine and Public Health as a group for their specialties were found more likely to have a higher score on

Extroversion ($p < 0.05$), Openness ($p < 0.05$) and Neuroticism ($p < 0.05$) than those who do not. People who choose Family Medicine and Public Health as their specialties are more likely to have lower conscientiousness ($p = 0.017$) scores than those who do not. People at the extremes of medical educational careers have more extraversion and openness scores than those in the 2nd and 3rd year of medical school. On the other hand, they also have a less agreeableness ($p = 0.012$) score than the others.

Opted Specialty 1 ^a		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Cardiology	Intercept*	31.271	26.311	1.413	1	0.235			
	EXTO	0.08	0.078	1.062	1	0.303	1.084	0.93	1.262
	AGRABL	-0.225	0.199	1.272	1	0.259	0.799	0.541	1.18
	CNST	-0.005	0.058	0.009	1	0.924	0.995	0.888	1.114
	NURO	-0.06	0.082	0.532	1	0.466	0.942	0.802	1.106
	OPN	-0.134	0.143	0.878	1	0.349	0.874	0.66	1.158
Family Medicine	Intercept	14.498	27.391	0.28	1	0.597			
	EXTO	0.222	0.097	5.205	1	0.023	1.249	1.032	1.512
	AGRABL	-0.211	0.208	1.029	1	0.31	0.81	0.538	1.218
	CNST	-0.029	0.078	0.138	1	0.71	0.971	0.833	1.132
	NURO	-0.059	0.091	0.424	1	0.515	0.942	0.789	1.126
	OPN	-0.07	0.154	0.209	1	0.647	0.932	0.69	1.26
Neurology	Intercept	28.87	26.41	1.195	1	0.274			
	EXTO	0.115	0.079	2.105	1	0.147	1.122	0.96	1.311
	AGRABL	-0.282	0.201	1.983	1	0.159	0.754	0.509	1.117
	CNST	-0.003	0.061	0.003	1	0.959	0.997	0.885	1.123
	NURO	-0.062	0.083	0.548	1	0.459	0.94	0.798	1.107
	OPN	-0.081	0.144	0.319	1	0.572	0.922	0.695	1.223
Psychiatry	Intercept	21.649	26.492	0.668	1	0.414			
	EXTO	0.071	0.079	0.81	1	0.368	1.073	0.92	1.252
	AGRABL	-0.203	0.2	1.022	1	0.312	0.817	0.551	1.209
	CNST	-0.009	0.06	0.021	1	0.885	0.991	0.882	1.114
	NURO	-0.023	0.083	0.074	1	0.785	0.978	0.83	1.151
	OPN	-0.055	0.145	0.143	1	0.705	0.947	0.713	1.257
Surgery	Intercept	23.13	26.308	0.773	1	0.379			
	EXTO	0.119	0.078	2.315	1	0.128	1.126	0.966	1.313
	AGRABL	-0.208	0.199	1.09	1	0.296	0.812	0.55	1.2
	CNST	-0.011	0.058	0.039	1	0.844	0.989	0.882	1.108
	NURO	-0.03	0.082	0.139	1	0.71	0.97	0.826	1.139
	OPN	-0.09	0.143	0.392	1	0.531	0.914	0.691	1.21

Table 2. Multinomial regression analysis between Career choices and personality trait scores

DISCUSSION

This study which included 223 participants in total was unable to show any significant association between personality traits as predictors and choice of a particular specialty as the response. This can be explained as many other factors that can play their role in influencing the choice of someone's career.⁽⁷⁾ These include the socio-economic background, the exposure duration, and quality of a particular specialty rotation, availability of a particular specialty, a teacher's influence on a person's mind, academic intelligence and IQ of a person, possession of a certain skill set and several other factors that might help in predicting a person's choice.^(8, 9) This calls for a bigger study with a wide range of explanatory variables as mentioned above to help explain someone's choice to produce a better prediction model.

This study, however, bridges the gap between making a better prediction model in ascertaining personality traits and their relative inclinations to different specialties.

On the other hand, the secondary analysis, taking a person's choice of specialty as predictor showed that those who opted for Family Medicine and Public health as a group for their specialties of choice were more likely to be extraverted, open and had more scores for neuroticism compared to those who opted for other specialties. The same group of people had lower scores for conscientiousness also. It was also interesting to find that medical students who are either at the beginning of the ends of their graduation tend to be more extraverted and open but less agreeable than those who are in the middle years of medical school. This may be due to the carefree nature of the very young and the very experienced both. On the other hand, more seriousness in education, thus a more conservative personality can be explained for those in the middle years of medical school. Females, in general, scored more on the neurotic domain than the male students on the BFI.

The results of this study are in contrast to an earlier study by Kwon et al. which showed some association between Agreeableness and Openness to Medicine as a specialty choice.⁽¹⁰⁾ This study nevertheless had a small sample size than this survey.

LIMITATIONS

This was an observational study with a sample size of 223 participants. Greater sample size would have increased the power of the study to detect any difference even better. Also, the sample mostly included medical students and medical professionals from a single province in Pakistan. For better external validity, a wider sampling could have been conducted all over Pakistan. Females (61.9%) were slightly represented more in the sample thus any conclusions based on sex difference may represent the

male population. Personality is a dynamic entity. It never stays the same after a few years. This can be compensated for with a cohort study design and adjusting for any changes in personality traits over time. A multitude of other possible predictors that can influence a person's choice as mentioned above can also be included in the analysis to achieve a better fitting prediction model. One important aspect to bear in mind is these were all medical students or recent graduates who participated in the survey the outcomes whether they chose the specialty choice which they made is unknown.

CONCLUSION

There is no significant association between personality traits and a person's choice of specialty. More powered studies with inclusion of more possible explanatory variables are required to create a better fitting prediction model in this regard. There is nevertheless an association between the choice of Family Medicine and Public Health as a group and being extraverted, open, more neuroticism and less conscientiousness. Young and senior medical students were more open and extraverted but less agreeable while females were more anxious and neurotic than their counterparts.

COMPLIANCE WITH ETHICAL STANDARDS

Conflict of Interest: Authors declare no conflict of interest or any funding source received for this study
Ethical approval: All procedures performed in studies involving human participants were by the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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