ORIGINAL ARTICLE

Specialty choice preference of medical students according to personality traits by Five-Factor Model

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Purpose: The purpose of this study was to determine the relationship between personality traits, using the Five-Factor Model, and characteristics and motivational factors affecting specialty choice in Korean medical students.

Methods: A questionnaire survey of Year 4 medical students (n=110) in July 2015 was administered. We evaluated the personality traits of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness by using the Korean version of Big Five Inventory. Questions about general characteristics, medical specialties most preferred as a career, motivational factors in determining specialty choice were included. Data between five personality traits and general characteristics and motivational factors affecting specialty choice were analyzed using Student t-test, Mann-Whitney test and analysis of variance.

Results: Of the 110 eligible medical students, 105 (95.4% response rate) completed the questionnaire. More Agreeableness students preferred clinical medicine to basic medicine (p=0.010) and more Openness students preferred medical departments to others (p=0.031). Personal interest was the significant motivational factors in more Openness students (p=0.003) and Conscientiousness students (p=0.003).

Conclusion: Medical students with more Agreeableness were more likely to prefer clinical medicine and those with more Openness preferred medical departments. Personal interest was a significant influential factor determining specialty choice in more Openness and Conscientiousness students. These findings may be helpful to medical educators or career counselors in the specialty choice process.

Key Words: Choice, Five-Factor Model, Medical students, Personality, Specialty

Introduction

Choosing a medical specialty is a complex, dynamic, and not fully understood process [1]. Many factors contribute to choosing a specific medical specialty as a career for medical students. These factors comprise gender, economic status, personality, personal interest, mentoring from professor, clinical experience during the clerkship, expected income, family influence, lifestyle, and the influence of public media [2,3,4,5]. Medical students may consider a variety of extrinsic factors (e.g., higher income, influence of family member) when choosing their medical specialty as a career. However, it is difficult to say that only these factors affect the specialty choice; other intrinsic factors will also participate in the specialty choice process. Previous reports regarding specialty choice emphasized students'

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personality, and more recent reports have focused on specialty level factors like lifestyle controllability, future income, prestige, and the effect of mentors and role models [6]. A controllable lifestyle has been investigated as the chief issue in specialty choice among U.S. medical students [7]. Nonetheless, personality is still useful determinant in specialty-decision making.

A choice of medical students' career is an essential matter for public medical service and policy on medical education [8]. It is also meaningful in individual's personal life and the physician workforce in one country. However, career counselors or professors often apply anecdotal evidences or their simple experiences about other medical specialties to medical students without personal considerations. Clarifying the factors that underlie the choice of specialties may provide a better understanding of students' preferences for a given specialty and may be helpful in the development of the healthcare systems. Among these factors, the personality traits of medical students will be the significant issue that cannot be ignored.

The analysis of personality traits that characterize students may elucidate the generalizable relationship with their specialty preferences. Using the Five-Factor Model of personality could lead to the description of personality traits that characterize particular medical students and predict success in performing the tasks entailed by different specialties [9].

The present authors were interested in verifying the association between medical students' characteristics such as personality traits, and the specialty choice. An exact understanding of these characteristics may permit the medical educators to supply better career counseling and would be beneficial in educating the residents. However, limited number of studies concerning the characteristics of medical students in Korea, including the personality traits, has been published [4].

The purpose of this study was to determine the relationship between personality traits and characteristics and motivational factors affecting specialty choice in Korean medical students.

Subjects and methods

1. Study design

This was a cross-sectional survey of 110 Year 4 medical students at Kyung Hee University School of Medicine in Korea. Students completing the entire clinical clerkship between July 2014 and June 2015 were included. Participants completed a well-designed questionnaire. Participation was fully voluntary and anonymous. The survey took approximately 10 minutes to complete. This study was approved by the Kyung Hee University's Institutional Review Board (KHSIRB-15- 003 [RA]).

2. Survey contents

Personality traits were examined to identify a correlation between specialty choice and personal traits. The Korean version of Big Five Inventory (BFI-K-10) was used. The BFI-K-10 is an abbreviated version of the 44-item BFI translated into Korean [10]. The BFI is an established self-report inventory designed to evaluate the personality traits of Extraversion (sociability, active, dominant, and positive emotions), Conscientiousness (being organized, careful behavior, persistent and achievement oriented), Agreeableness (trust, altruism, cooperation, and sympathy), Neuroticism (anxiety, depression, and hostility), and Openness (imaginativeness, curiosity, sensitivity, and a need for variety). It also possesses significant levels of reliability and validity in a variety of cultures [11]. Mean scores in each personality trait were computed by the sum of the true score in positive

items and the reverse score in negative items. The BFI-10 and the five personality factors that correlate numbers of BFI-10 are shown in Table 1. Cronbach α was 0.713 for BFI-10.

Questions about general characteristics sought for information on age, gender, marital status (single/married), previous undergraduate major before entering the medical school (medical/nonmedical sciences), and economic status (above middle class without debt/less than middle class). Medical parts (basic/clinical medicine) and clinical departments of specialties most preferred as a career were evaluated within three specialties (plural response). We divided the medical specialties into three groups; medical departments (e.g., internal medicine, pediatrics, family medicine, neurology and so forth), surgical departments (e.g., general surgery, orthopedic surgery, thoracic surgery, and so forth) and other departments including support specialists (e.g., emergency medicine, radiology, laboratory medicine, and so forth). We also divided the medical fields into practitioner (physician who directly examine the patient) and nonpractitioner (physician who do not examine the patient).

Motivational factors for determining specialty choice included anticipated income, lifestyle, professional prestige, occupational satisfaction, personal interest, influence of media, influence of family members, and influence of professor or resident during medical school. A four-step scale (1 [no influence] to 4 [strong influence]) was applied in ranking the motivational factors determining specialty choice.

3. Statistical methods

Data between five personality traits and general characteristics and motivational factors affecting the specialty choice were analyzed using Student t-test, Mann-Whitney test and analysis of variance. Statistical significance was set at $p<0.05$. IBM SPSS for Windows version 22.0 (IBM Corp., Armonk, USA) was used for statistical analyses.

Table 1. The Big Five Inventory-10 (BFI-10) and Five Personality Traits and Each Correlate Numbers of the BFI-10

How well do the following statements describe your personality?						
	I see myself as someone who …	Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
1	… is reserved	(1)	(2)	(3)	(4)	(5)
2	… is generally trusting	(1)	(2)	(3)	(4)	(5)
3	… tends to be lazy	(1)	(2)	(3)	(4)	(5)
4	… is relaxed, handles stress well	(1)	(2)	(3)	(4)	(5)
5	… has few artistic interests	(1)	(2)	(3)	(4)	(5)
6	… is outgoing, sociable	(1)	(2)	(3)	(4)	(5)
7	… tends to find fault with others	(1)	(2)	(3)	(4)	(5)
8	… does a thorough job	(1)	(2)	(3)	(4)	(5)
9	… gets nervous easily	(1)	(2)	(3)	(4)	(5)
10	… has an active imagination	(1)	(2)	(3)	(4)	(5)

5 Personality traits	Typical characteristics	Matched question number
Extraversion	Talkative, assertive, energetic, sociable	1R*, 6
Agreeableness	Good-natured, trustful cooperative	2, 7R*
Conscientiousness	Orderly, responsible, dependable	3R*, 8
Neuroticism	Neurotic, easily upset, tense, depression, not-self confident	4R*, 9
Openness	Intellectual, imaginative, independent-minded	5R*, 10

*'R' behind number indicates using the reverse-scored item.

Results

1. General characteristics of medical students and personal traits

Of the 110 eligible Year 4 medical students, 105 (95.4% response rate) completed the questionnaire. Sixty-four students (61%) were males and 41 students (39%) were females. The mean age was 28.9±2.1 years. Compared to younger students, older students (above 30) had more Conscientiousness (p=0.039), more Agreeableness (p=0.039) and less Neuroticism (p=0.029). Regarding the marital status, married students (including cohabitation) had significantly more Conscientiousness (p=0.015) and Agreeableness (p=0.004) (Table 2). Other characteristics demonstrated no significant differences.

2. Specialty choice preference and personal traits

In analysis of specialty departments that students most preferred as a career, internal medicine (n=36) topped

Table 3. High Rank Positions by Specialties Preference of Medical Students

Specialty[a]	No. (%)
Internal medicine	36 (34.2)
Neurology	17 (16.1)
Rehabilitation	17 (16.1)
Anesthesiology	16 (15.2)
Pediatrics	16 (15.2)
Radiology-diagnostic	16 (15.2)
Family medicine	15 (14.3)
General surgery	14 (13.3)
Neuropsychiatry	14 (13.3)

[a]Plural response (within three specialties).

Table 2. General Characteristics of Medical Students according to Personality Traits

Characteristic	No.	Personality traits									
		Extraversion		Conscientiousness		Agreeableness		Neuroticism		Openness	
		Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value
Age (yr)[a]											
Under 29	70	6.129±1.32	0.875	6.614±1.39	0.039	6.700±1.24	0.039	5.800±1.55	0.029	6.386±1.57	0.380
Above 30	35	6.086±1.26		7.200±1.25		7.229±1.16		5.086±1.56		6.686±1.77	
Gender[a]											
Male	64	6.172±1.37	0.574	6.938±1.43	0.235	6.766±1.28	0.255	5.359±1.54	0.103	6.438±1.70	0.709
Female	41	6.024±1.19		6.610±1.26		7.049±1.16		5.878±1.61		6.561±1.55	
Marital status[b]											
Single	92	6.087±1.31	0.638	6.663±1.32	0.015	6.772±1.25	0.004	5.674±1.61	0.052	6.565±1.62	0.215
Married	13	6.308±1.25		7.846±1.34		7.615±0.76		4.769±1.16		5.923±1.70	
Previous major[b]											
Medical[c]	17	6.353±1.83	0.428	6.471±1.73	0.695	6.588±1.80	0.360	6.235±2.01	0.160	7.000±1.93	0.083
Nonmedical	88	6.068±1.18		6.875±1.29		6.932±1.10		5.432±1.46		6.386±1.57	
Economic status[a]											
Poor	42	6.048±1.59	0.671	6.714±1.56	0.564	6.690±1.47	0.211	5.619±1.99	0.765	6.548±1.95	0.754
Above average	63	6.159±1.08		6.873±1.23		7.000±1.04		5.524±1.25		6.444±1.41	
Previous grade[a]											
Under 3.0	46	6.261±1.21	0.807	6.935±1.41	0.729	6.913±1.07	0.145	5.283±1.42	0.112	6.239±1.67	0.175
Above 3.0	59	6.000±1.36		6.712±1.33		6.847±1.36		5.780±1.68		6.678±1.60	

SD: Standard deviation.
[a]p-value was calculated by Student t-test. Statistical significance was set at $p<0.05$, [b]p-value was calculated by Mann-Whitney test. Statistical significance was set at $p<0.05$, [c]Medical sciences included medicine, dental medicine, oriental medicine, and nursing.

the list, followed by orthopedic surgery (n=27), emergency medicine (n=18), neurology (n=17), and rehabilitation (n=17) (Table 3). The personality traits revealed by the BFI-10-K questionnaire indicated that more Agreeableness students preferred clinical medicine to basic medicine (p=0.010). More Openness students preferred medical departments to other specialties (p=0.031) (Table 4). There was no significant difference in medical fields.

3. Motivational factors and personal traits

More Openness students (p=0.003) and Conscien-

Table 4. Specialty Choice Preference of Medical Students according to Personality Traits

	No.	Personality traits									
		Extraversion		Conscientiousness		Agreeableness		Neuroticism		Openness	
		Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value
Medical parts[a]											
Clinical medicine	99	6.162±1.25	0.497	6.869±1.31	0.062	6.970±1.12	0.010	5.475±1.52	0.118	6.535±1.58	0.104
Basic medicine	5	5.400±2.19		5.400±1.94		5.000±2.00		6.800±2.16		5.000±2.00	
Medical fields[a]											
Practitioner	83	6.060±1.29	0.325	6.904±1.41	0.077	6.928±1.25	0.555	5.434±1.53	0.284	6.578±1.58	0.167
Nonpractitioner	18	6.333±1.41		6.389±1.19		6.833±1.09		6.000±1.74		6.111±1.84	
Clinical departments[b]											
Medical	64	6.094±1.26	0.827	6.719±1.33	0.537	6.922±1.31	0.859	5.594±1.63	0.666	6.781±1.59	0.031
Surgical	17	6.059±1.47		7.118±0.99		7.059±1.31		5.235±1.30		6.235±1.20	
Others[c]	20	6.200±1.36		6.850±1.81		6.750±1.33		5.600±1.69		5.800±1.88	

SD: Standard deviation.
[a]p-value was calculated by Mann-Whitney test. Statistical significance was set at $p<0.05$, [b]p-value was calculated by analysis of variance. Statistical significance was set at $p<0.05$, [c]Other specialties included support specialists (e.g., emergency medicine, radiology, laboratory medicine, and so forth).

Table 5. Motivational Factors Affecting Specialty Choice of Medical Students according to Personality Traits

	No.	Personality traits									
		Extraversion		Conscientiousness		Agreeableness		Neuroticism		Openness	
		Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value
Anticipated income[a]											
MI	58	6.069±1.40	0.694	6.741±1.52	0.575	6.793±1.34	0.448	5.500±1.77	0.659	6.379±1.69	0.463
LI	47	6.170±1.18		6.894±1.16		6.979±1.09		5.638±1.32		6.617±1.58	
Lifestyle[b]											
MI	86	6.081±1.32	0.483	6.802±1.37	0.804	6.884±1.27	0.656	5.488±1.64	0.139	6.512±1.65	0.839
LI	19	6.263±1.24		6.842±1.42		6.842±1.06		5.895±1.28		6.368±1.60	
Professional prestige[a]											
MI	42	5.952±1.49	0.301	6.857±1.49	0.773	6.881±1.34	0.975	5.476±1.83	0.653	6.571±1.68	0.664
LI	63	6.222±1.15		6.778±1.30		6.873±1.17		5.619±1.40		6.429±1.62	
Personal interest[b]											
MI	86	6.070±1.32	0.433	6.965±1.35	0.008	7.058±1.14	0.003	5.419±1.52	0.055	6.581±1.61	0.126
LI	19	6.316±1.20		6.105±1.24		6.053±1.35		6.211±1.71		5.053±1.74	
Influence of media[a]											
MI	53	6.057±1.40	0.649	6.736±1.38	0.581	6.717±1.34	0.185	5.830±1.56	0.080	6.415±1.49	0.658
LI	52	6.173±1.20		6.885±1.36		7.038±1.10		5.288±1.57		6.558±1.78	

(Continued to the next page)

Table 5. (Continued)

	No.	Personality traits									
		Extraversion		Conscientiousness		Agreeableness		Neuroticism		Openness	
		Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value	Mean±SD	p-value
Influence of family members[a]											
MI	30	5.833±1.53	0.130	7.033±1.58	0.331	6.600±1.49	0.171	5.700±1.68	0.510	6.133±1.90	0.114
LI	65	6.277±1.20		6.738±1.25		6.985±1.13		5.462±1.61		6.723±1.55	
Influence of professor or resident[a]											
MI	39	6.000±1.43	0.404	6.846±1.11	0.931	7.128±1.26	0.089	5.205±1.79	0.098	6.769±1.59	0.265
LI	56	6.232±1.25		6.821±1.52		6.679±1.25		5.768±1.47		6.375±1.74	

SD: Standard deviation, MI: More important, LI: Less important.
[a]p-value was calculated by Student t-test. Statistical significance was set at $p<0.05$, [b]p-value was calculated by Mann-Whitney test. Statistical significance was set at $p<0.05$.

tiousness students (p=0.003) answered that personal interest was the most important motivational factor in the specialty choice (Table 5).

Discussion

The purpose of this research was to clarify the relationship between the personality traits and the characteristics and motivational factors affecting specialty choice. The personality trait is a typical intrinsic factor in the specialty choice. According to previous studies, human personality could be summarized into five dimensions which potentially represent affective, behavioral and cognitive characteristics [12]. The five dimensions include Extraversion, Conscientiousness, Agreeableness, Neuroticism, and Openness.

The personality trait has been known to play a role in making a decision in the medical career [13]. There are various studies concerning the relationship between the personality traits and specialty choice. A review paper on the personality and medical specialty choice suggested that it was difficult to draw a thorough and significant conclusion because of the variety of tools used to measure the personality [9]. On the other hand, there was another study in which Big Five personality traits were the predictors of future performance outcomes [14]. Nevertheless, knowledge of the personality will play an important role in career counseling.

In this study, student with more Agreeableness preferred clinical medicine to basic medicine. McCrae & Costa [15] described that Agreeableness associated with trust, altruism, cooperation, and sympathy. Clinicians should communicate and cooperate with various professions such as nurses and technicians as well as the patients. Such relationship is more important than in basic medical parts. Thus we hypothesized that more Agreeableness students preferred clinical medicine, which is accordant with previous studies.

Student with more Openness preferred medical departments. The preceding study showed that internists showed more Conscientiousness because they were highly self-reliant, but less Extraversion because they tend to focus on the inside world of ideas rather than the community relationship [16]. Surgeons were described as extraversion and openness to experience in a previous study [17]. The finding is inconsistent with those of the aforementioned studies, although those studies were on medical doctors and not on the students. Such finding may be related to the opinion that medical students adapt

to different training and practice environments specific to their specialty [9].

More Openness students responded that occupation satisfaction and personal interest were significant motivational factors in specialty choice. More Conscientiousness students also replied that the personal interest was an important factor. Conscientiousness pertains to being organized, persistent, and achievement oriented [9]. While choosing a specialty, they may be organized or persistent in achieving their goal. For that reason, students with conscientious personality may take relatively more importance in the personal interest than in other factors such as greater income and higher social status. However, personal interest was a significant factor in two divergent personality traits. According to the past research, the most important factors in specialty decision were interest and aptitude [18]. Personal interest is a common and essential factor in many other personalities, thus it should not be limited as one personality.

In the general characteristics and personal traits, older students had the tendency to be more conscientious and agreeable. This result was consistent with the past studies, suggesting that the personality of older people generally will change to be more conscientious and agreeable [19].

The current study has several limitations. It was conducted in only one class of Year 4 at a single medical school at one point in a time within Korea. Therefore, it is difficult to generalize the findings. In addition, the number of students who had enrolled in the study was insufficient to attain statistical power. Multiyear research will be needed to determine more meaningful results. This research did not closely examine other motivational factors such as religion, competitiveness and duration of residency program. We also did not subdivide the economic status of the medical students.

In conclusion, the present results suggest that medical students with more Agreeableness were more likely to prefer clinical medicine and students with more Openness preferred medical departments. Personal interest was the significant influential factors determining specialty choice in more Openness and Conscientiousness students. Despite the limitations, this study may be helpful to medical students, professors, and medical educators in the specialty choice process. Further research with larger number of students and other grades of students will be required to evaluate the more meticulous factors associated with specialty choice.

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