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Correlation Between Personality Traits and Professional Identity Among Fresh Medical Students

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Abstract: Objective To explore the effects of different personality traits on professional identity among first-year medical freshmen, so as to provide references for freshman education in universities. Methods A convenience sampling method was adopted. A total of 907 freshmen from a medical university in Guangzhou were recruited as research subjects in September 2021. The general information questionnaire, Big Five Personality Inventory and College Students' Professional Identity Scale were used for investigation, and SPSS 26.0 software was applied for correlation analysis. Results A total of 898 valid questionnaires were recovered. The overall professional identity score of participants was at a relatively high level (86.03±12.53). Students with medical relatives, those who admired medical role models, those who never considered quitting medical studies, and those with high weekly intake of fruits and vegetables tended to have higher professional identity scores ($P<0.05$). Neuroticism was significantly negatively correlated with professional identity (r=-0.327, $P<0.05$). Extraversion, openness, agreeableness and conscientiousness positively predicted higher professional identity ($P<0.05$), among which conscientiousness exerted the strongest impact (r=0.417, $P<0.05$). Conclusion Among individual personality traits, neuroticism negatively predicts medical students' professional identity. Medical universities should pay special attention to freshmen with high neuroticism in career cultivation. Universities should strengthen the construction of medical role model culture, guide students to establish medical idols, encourage regular intake of fruits and vegetables, and foster students' conscientious personality.

Keywords: Medical Students; Personality Traits; Professional Identity.

1. Introduction

The healthcare system serves as the core pillar for safeguarding people's physical and mental health and advancing the Healthy China Initiative. The quality of medical talent training directly determines the development level of the healthcare industry and the capacity of public health emergency response. As the starting cohort of medical talent cultivation, first-year freshmen undergo a dual transition from senior high school to university and from general liberal studies to specialized medical curricula. They are confronted with multiple industry-specific challenges, including difficult professional courses, lengthy schooling cycles, tensions arising from doctor-patient relationships, low occupational error tolerance, and heavy workloads. Under such pressures, freshmen are prone to problems such as vague professional cognition, insufficient learning motivation, weak sense of occupational belonging, and strong willingness to transfer majors. A stable and positive professional identity acts as the core internal driving force that motivates medical students to complete their studies persistently, devote themselves to the healthcare field, and establish firm professional beliefs as medical practitioners[1].

Personality traits are stable psychological characteristics shaped jointly by innate endowments and acquired environments. They govern individuals' emotional perception, behavioral styles, stress resistance, and interpersonal interaction patterns, constituting key intrinsic psychological factors that shape people's professional attitudes and value judgments. The Big Five Personality Model is the most widely adopted personality assessment framework in academia, which divides personality into five dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience[2]. Suitable for psychological assessment of young populations, this model has been extensively applied in research fields including pedagogy, nursing, and clinical psychology.

The first year of university represents a critical window for shaping professional perceptions. Clarifying the differential impacts of various personality traits on medical students' professional identity at an early stage enables medical universities to accurately identify freshmen at high risk of low professional identity. On this basis, the present study recruited 907 first-year freshmen from a medical university in Guangzhou as research subjects. A cross-sectional survey was conducted using the Big Five Personality Inventory to analyze the correlations between the five personality dimensions and professional identity, explore the predictive effects of personality traits on professional identity, and identify the core personality dimensions influencing medical students' professional identity. This study aims to provide empirical evidence and practical references for medical universities to implement stratified freshman orientation education, psychological counseling targeting personality adjustment, and professional empowerment training. It also intends to improve students' professional identity in a targeted manner, reduce the major transfer rate, and cultivate stable and high-quality grassroots medical talents.

2. Subjects and Methods

A convenience sampling method was adopted to conduct a questionnaire survey among 907 first-year medical freshmen from a university in Guangzhou in September 2021.Inclusion criteria:1 Freshmen majoring in medicine-related disciplines;2 Voluntary participation in this survey. Exclusion criteria: Freshmen enrolled in non-medical majors. This study

was approved by the relevant ethics committee (Approval No.: NFYKDX002). All participants provided informed consent and took part voluntarily.

(1) Survey Instruments

General Information Questionnaire: It collected demographic information including gender, age, annual household income, and whether participants had relatives engaged in medical professions. Neuroticism Extraversion Openness Five-Factor Inventory (NEO-FFI): The simplified version of the Big Five Personality Inventory developed by Costa and McCrae[3]was adopted in this study. It consists of 60 items covering five dimensions: neuroticism, extraversion, openness, agreeableness, and conscientiousness. A 5-point Likert scoring system was applied, and the scale exhibited satisfactory reliability and validity. College Students' Professional Identity Scale: This study utilized the College Students' Professional Identity Scale compiled by Qin Panbo[4]. The scale contains 23 items divided into four dimensions: cognitive identity (understanding of the major), affective identity (affection for the major), behavioral identity (learning behaviors related to the major), and fit identity (matching degree between oneself and the major).

(2) Data Collection and Quality Control

Paper questionnaires were distributed offline for data collection in this study. Prior to the survey, permissions were obtained from participants' counselors, relevant administrators and class cadres. The researcher personally explained the research purpose, survey contents, research significance and filling instructions to all respondents, and clarified the confidentiality principle as well as inclusion and exclusion criteria. All questionnaires were collected on site immediately after completion. Upon collection, the researcher promptly checked for missing or incorrect responses, and eliminated questionnaires filled out with regular repetitive patterns.

(3) Statistical Methods

SPSS 26.0 software was used for statistical analysis of the survey data. Measurement data conforming to normal distribution were described as mean ± standard deviation; measurement data inconsistent with normal distribution were expressed as median and interquartile range. Enumeration data were presented as frequency and constituent ratio. Spearman correlation analysis was performed to test the correlation between personality traits and professional identity.

3. Results

(1) Basic information of the respondents

A total of 907 freshmen were surveyed, and 898 valid questionnaires were collected. Among the participants, 467 (52.0%) came from rural areas; 259 (28.8%) were male and 639 (71.2%) were female; 203 (22.6%) were only children; 861 (95.9%) were of Han nationality. Regarding annual household income, 273 participants (30.4%) had an annual family income below 80,000 RMB, 431 (48.0%) had an income ranging from 80,000 to 150,000 RMB, and 194 (21.6%) earned over 150,000 RMB per year. A total of 787 freshmen (87.6%) had relatives engaged in medical-related professions, and 739 (82.3%) looked up to senior medical professionals as role models. In addition, 296 students (33.0%) had considered quitting medical studies. A total of 204 freshmen (22.8%) slept less than 7 hours every day. Only 293 students (32.6%) maintained daily red meat intake, whereas 362 (40.3%) kept regular daily consumption of fruits and vegetables.

(2) Level of Professional Identity Among First-Year Medical Students

Taking the professional identity score of freshmen as the dependent variable, t-tests or one-way analysis of variance (ANOVA) were performed with grouping variables including gender, only-child status, place of origin, household economic status, ethnicity, parental rearing patterns, having relatives working in medical fields, having medical role models, previous thoughts of abandoning medical studies, smoking and drinking habits, sleep duration, daily red meat intake, and daily fruit and vegetable intake. The results are presented in Table 1.

As shown in Table 1, freshmen who had relatives engaged in medical professions, admired medical role models, never considered quitting medical studies, and consumed fruits and vegetables more frequently per week tended to exhibit significantly higher professional identity scores ($P<0.05$).

(3) Descriptive Statistics and Correlation Analysis of Each Personality Trait and Professional Identity

Pearson correlation analysis was conducted on each personality trait and professional identity, and the corresponding correlation coefficients are presented in Table 2.

The overall professional identity level of first-year medical students was favorable (86.03±12.53). Neuroticism was significantly negatively correlated with professional identity (r=-0.327, $P<0.01$), while extraversion, openness, agreeableness and conscientiousness were all significantly positively correlated with professional identity ($P<0.01$). See Table 2.

4. Discussion

(1) The overall professional identity of freshmen was at a relatively high level

The present study found that the average total score of professional identity among freshmen from a university in Guangzhou reached (86.03±12.53), indicating generally sound acceptance and a strong sense of belonging to the medical discipline shortly after admission. Two main factors account for this outcome. First, most students voluntarily selected medicine during college application and entered the program with genuine expectations for clinical practice. Second, public recognition of medical practitioners' social value has grown continuously, and mainstream media's widespread positive reporting on physicians' life-saving deeds has further reinforced freshmen's positive impressions of the medical profession.

However, obvious individual differences in professional identity were observed within the sample. Variations were mainly driven by family background in healthcare, identification with medical role models, willingness to persist in medical studies, daily lifestyle behaviors, and inherent personality traits. These findings imply that medical schools should abandon standardized, uniform freshman training models and implement stratified, targeted and individualized career guidance for new students.

(2) Higher Fresh Fruit and Vegetable Intake May Elevate Medical Freshmen's Professional Identity

The present study revealed that freshmen who had relatives working in healthcare, identified with medical role models, never contemplated dropping out of medical studies, and consumed fruits and vegetables more frequently per week

attained significantly higher levels of professional identity.

Table 1. Differences in Professional Identity of First-Year Medical Students Across Demographic Subgroups

Item	Total n (%)	Professional Identity Score	t/F value	P value
Gender			0.759	0.448
Male	259(28.8)	86.53±13.50		
Female	639(71.2)	85.83±12.12		
Only-child status			-1.440	0.150
Non-only child	695(77.4)	85.70±12.32		
Only child	203(22.6)	87.15±13.20		
Hometown type			-0.656	0.512
Rural area	467(52.0)	85.77±12.31		
Urban area	431(48.0)	86.32±12.76		
Household economic status			0.483	0.694
Low-income	273(30.4)	85.60±12.68		
Primary well-off	431(48.0)	85.97±12.50		
Middle class	171(19.0)	85.58±12.69		
High-income	23(2.6)			
Ethnicity			-0.053	0.958
Han nationality	861(95.9)	86.03±12.42		
Ethnic minorities	37(4.1)	86.16±14.93		
Parental rearing style			1.120	0.340
Democratic parenting	719(80.1)	86.41±13.32		
Authoritarian parenting	112(12.5)	84.77±13.37		
Indulgent parenting	5(0.6)	84.00±13.15		
Neglectful parenting	62(6.9)	84.13±13.29		
Relatives with medical occupations			-3.892	<0.001
No	787(87.6)	85.43±12.27		
Yes	111(12.4)	90.33±13.53		
Having medical role models			-5.199	<0.001
No	739(82.3)	85.04±12.49		
Yes	159(17.7)	90.65±11.65		
Thoughts of quitting medical studies			14.523	<0.001
No	602(67.0)	89.87±11.05		
Yes	296(33.0)	78.24±11.72		
Smoking status			0.141	0.661
Never smoked	889(99.0)	86.00±12.56		
Current smoker	4(0.4)	88.00±9.90		
Former smoker	5(0.6)	90.80±9.47		
Drinking status			2.127	0.120
Never drunk	837(93.2)	85.81±12.46		
Current drinker	58(6.5)	89.31±13.16		
Former drinker	3(0.3)	85.33±14.57		
Average sleep duration			2.374	0.051
<5h	5(0.6)	86.20±15.40		
5-6h	199(22.2)	85.00±13.04		
7-8h	651(72.5)	86.00±12.32		
9-10h	41(4.6)	91.59±12.30		
≥11h	2(0.2)	87.00±2.83		
Red meat intake frequency			1.028	0.379
Never / Rarely	41(4.6)	87.95±13.78		
1–3 days/week	300(33.4)	86.78±11.46		
4–6 days/week	364(29.4)	85.42±12.62		
Daily	293(32.6)	85.56±13.29		
Fruit and vegetable intake frequency			6.773	<0.001
Never / Rarely	30(3.3)	84.43±13.65		
1–3 days/week	292(32.5)	83.57±12.73		
4–6 days/week	214(23.8)	86.52±12.44		
Daily	362(40.3)	87.87±12.01		

Table 2. Descriptive Statistics and Correlation Analysis of All Variables

	M±SD	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness	Professional Identity
Neuroticism	33.66±8.33	1					
Extraversion	38.82±5.87	-0.559**	1				
Openness	43.33±5.96	-0.151**	0.179**	1			
Agreeableness	42.14±5.56	-0.460**	0.362**	0.132**	1		
Conscientiousness	42.98±6.59	-0.512**	0.470**	0.312**	0.414**	1	
Professional Identity	86.03±12.53	-0.327**	0.295**	0.244**	0.238**	0.417**	1
Note: Correlation is significant at the 0.01 level (two-tailed).							

From a family background perspective, students with medical family members are continuously exposed to real-world clinical work. They possess more intuitive and clear perceptions of career pathways and the intrinsic value of healthcare, which mitigates the sense of disillusionment stemming from insufficient industry information after enrollment. Students who look up to medical role models can draw spiritual strength from these exemplars[5], establish long-term academic goals, and boost their internal learning motivation. Meanwhile, freshmen who have never considered abandoning medicine exhibit firmer motivation for major selection and a stronger foundational sense of professional identification.

Notably, frequent fruit and vegetable consumption was positively correlated with professional identity. Regular, balanced dietary habits reflect sound, stable physical and mental status. Students with favorable psychosomatic well-being demonstrate superior emotion regulation capacity, making them less susceptible to academic burnout and negative perceptions of their major amid heavy medical coursework and high-pressure learning environments. In contrast, irregular eating and rest patterns are often accompanied by adverse emotions such as anxiety and exhaustion, which in turn diminish students' acceptance of their medical discipline. These findings indicate that beyond ideological and career guidance, medical schools should integrate health lifestyle education into freshman training systems.

(3) Conscientiousness Positively Predicts Higher Professional Identity

In this study, the correlation coefficient between conscientiousness and professional identity was 0.417, representing the strongest predictive effect among the four positive personality dimensions. Medicine features an intricate knowledge system that places stringent demands on attention to detail, logical thinking and a strong sense of responsibility[6]. Freshmen with high conscientiousness are meticulous, self-disciplined and persistent in learning. They can adapt to the long-term, high-intensity study mode of medical training and are more likely to gain a sense of achievement through repeated theoretical memorization and practical skill training. Furthermore, the sense of responsibility derived from conscientiousness enables students to fully understand the mission of medical practitioners and voluntarily develop a solid sense of professional belonging. Accordingly, during freshman orientation and class-based training, medical universities may design targeted activities including laboratory practice, case seminars and standardized skill training to cultivate students' rigorous work habits, strengthen this personality strength, and improve their overall professional identity.

(4) Neuroticism Negatively Predicts Professional Identity

Neuroticism was significantly negatively correlated with professional identity ($r = -0.327$). Freshmen with high neuroticism tend to experience drastic mood swings and possess poor stress tolerance. When confronted with heavy medical coursework, frequent assessments and the anticipated pressures of future clinical work, they are prone to developing negative emotions such as anxiety and self-doubt, which in turn make them question their major choice and reduce their professional identity.

For such students, universities should establish a regular follow-up mechanism integrating psychological counseling and ideological education for freshmen. Relevant measures include conducting routine mental health screenings to dynamically monitor emotional fluctuations, offering special courses on stress management and emotion regulation, and organizing sharing sessions led by outstanding medical role models to help students reframe negative perceptions positively. Meanwhile, universities should also promote healthy dietary and sleep routines to alleviate emotional sensitivity from both physical and psychological perspectives, gradually correct students' negative attitudes toward their major and strengthen their sense of professional belonging.

5. Conclusion

Collectively, based on the findings of the present study, the cultivation of professional identity in first-year medical students can be implemented via coordinated multi-dimensional strategies:

(1) Institutional cultural construction. Regular lectures featuring distinguished clinicians and alumni role models should be held to build accessible platforms for students to learn from medical exemplars.

(2) Healthy lifestyle management. Knowledge of balanced diets and regular sleep schedules should be broadly disseminated to help students maintain stable physical and mental health.

(3) Personality development. Hands-on practice, research activities and volunteer services can be adopted to cultivate students' conscientiousness.

(4) Targeted psychological intervention. Special attention should be paid to students with high neuroticism; a dedicated psychological support system needs to be established to alleviate negative emotions in a timely manner.

Such individualized and comprehensive freshman education interventions are expected to sustainably enhance early professional identity among medical undergraduates and reduce the prevalence of subsequent undesirable outcomes, including major transfer and academic burnout.

References

[1] Zhang, S., Ge, S., Tian, J., et al. (2022). A cross-sectional study of individual learning passion in medical education: Understanding self-development in positive psychology. Frontiers in Psychology, 13, 758002. https://doi.org/ 10. 3389/ fpsyg.2022.758002.

[2] Zhou, Y., Li, D., Li, X., Wang, Y., & Zhao, L. (2017). Big five personality and adolescent Internet addiction: The mediating role of coping style. Addictive Behaviors, 64, 42–48. https:// doi. org/10.1016/j.addbeh.2016.08.009.

[3] McCrae, R. R., & Costa, P. T., Jr. (2004). A contemplated revision of the NEO Five-Factor Inventory. Personality and Individual Differences, 36(3), 587–596. https://doi. org/10. 1016/ S0191-8869(03)00118-1.

[4] Panbo, Q. (2009). The characteristic and correlation study of college student' speciality identity [Master's thesis]. Southwest University.

[5] Zhang, H., He, W., Cao, D., et al. (2025). Epidemic-induced changes in nursing students' professional identity: A qualitative investigation. Frontiers in Public Health, 13, 1565212. https:// doi. org/10.3389/fpubh.2025.1565212.

[6] Wang, H., Liu, Y., Wang, Z., et al. (2023). The influences of the Big Five personality traits on academic achievements: Chain mediating effect based on major identity and self-efficacy. Frontiers in Psychology, 14, 1065554. https://doi. org/ 10. 3389/fpsyg.2023.1065554.

[7] Hendelman, W., & Byszewski, A. (2014). Formation of medical student professional identity: Categorizing lapses of professionalism, and the learning environment. BMC Medical Education, 14(1), 139. https://doi.org/10.1186/1472-6920-14-139.