Analysis of Influencing Factors on the Professional Identity of Rural Order-Directed Medical Students Based on Grounded Theory: A Qualitative Research Postprint

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Date: 2023-12-19T00:00:00+00:00

Abstract

Background With the continuous implementation of China's rural order-directed medical student training program (abbreviated as publicly-funded medical students), the primary care general practice talent pool has been continuously strengthened, and the current status of and factors influencing publicly-funded medical students' professional identity have attracted widespread attention. **Objective** To analyze the influencing factors of publicly-funded medical students' professional identity. **Methods** Using purposive sampling, semi-structured interviews were conducted from December 2022 to March 2023 with 30 publicly-funded medical students from the Huimin class of Traditional Chinese Medicine (five-year program) at Shandong University of Traditional Chinese Medicine from 2018 to 2022. Following the procedural grounded theory approach of Anselm Strauss and Juliet Corbin, open coding, axial coding, and selective coding were employed to code and analyze the interview data. **Results** Through open coding, 482 initial concepts and 47 basic categories were extracted; through axial coding, 9 main categories were obtained; through selective coding, a typical relational structure was formed, showing that the influencing factors of publicly-funded medical students' professional identity are composed of six major dimensions: professional cognition, professional behavior, professional choice, professional will, professional emotion, and professional belief. **Conclusion** The influencing factors of publicly-funded medical students' professional identity are composed of six major dimensions: professional cognition, professional behavior, professional choice, professional will, professional belief, and professional emotion, among which professional cognition, professional behavior, and professional choice belong to explicit factors, while professional will, professional belief, and

professional emotion belong to implicit factors.

Full Text

Preamble

Root Cause Analysis of the Influencing Factors of Professional Identity in Rural Order-oriented Medical Students: A Qualitative Study

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Abstract

Background: With the continuous development of the training program for rural order-oriented medical students (referred to as publicly-funded medical students) in China, the talent pool of general practice is constantly expanding, and the status of professional identity among these students and its influencing factors have become a focus of attention. **Objective:** To analyze the influencing factors of professional identity among publicly-funded medical students. **Methods:** Using purposive sampling, 30 publicly-funded medical students from the 2018–2022 cohorts of the Traditional Chinese Medicine (five-year program) Beneficiary Class at Shandong University of Traditional Chinese Medicine were interviewed via semi-structured interviews between December 2022 and March 2023. Following the Anselm Strauss and Juliet Corbin programmatic grounded theory approach, interview data were coded and analyzed through open coding, axial coding, and selective coding. **Results:** Open coding extracted 482 initial concepts and 47 basic categories; axial coding yielded 9 main categories; selective coding formed a typical relationship structure showing that influencing factors of professional identity among publicly-funded medical students consist of six dimensions: career cognition, career behavior, career choice, career will, career emotion, and career belief. **Conclusion:** The influencing factors of professional identity among publicly-funded medical students are composed of six

dimensions: career cognition, career behavior, career choice, career will, career belief, and career emotion. Among these, career cognition, career behavior, and career choice are exogenous factors, while career will, career belief, and career emotion are implicit factors.

Keywords: Occupations; Social identification; Root cause analysis; Professional identity; Rural order-oriented medical students; Grounded theory; Qualitative research

Introduction

Since 2010, 51 medical colleges and universities across 23 provinces in China have implemented the rural order-oriented free medical student training program [**?**, **?**]. Publicly-funded medical students receive free training at medical colleges and universities to cultivate high-quality general medical personnel for primary-level medical and health institutions [**?**, **?**], representing a fundamental strategy for strengthening the rural primary-level medical and health workforce [**?**]. However, the relatively complex working environment of rural primary-level health talent has long been intertwined with conditions of "low compensation, low status, low recognition, and difficult promotion" [**?**], which to some extent affects the professional identity and development of publicly-funded medical students. How to cultivate and enhance the professional identity of these students has become an important issue requiring urgent resolution.

Professional identity refers to an individual's positive perception and evaluation of the purpose, social value, and other factors of their occupation, representing recognition and acceptance of the professional role endowed by society [**?**, **?**]. A review of relevant literature on professional identity reveals that previous research has primarily focused on questionnaire development and improvement strategies [**?**, **?**], with limited exploration of influencing factors. Research subjects have mainly included teachers, medical staff, normal school students, and journalists [**?**], with few studies addressing publicly-funded medical students. Methodologically, most studies have employed quantitative approaches, with scarce qualitative research. Compared with quantitative research, qualitative studies are better suited for uncovering core issues influencing professional identity that lie hidden within individuals. Therefore, this study focuses on publicly-funded medical students who have not yet formally entered the workforce, employing grounded theory within qualitative research to analyze the influencing factors of their professional identity, with the aim of providing references for enhancing their professional identity.

Grounded theory refers to a research method in which researchers progressively describe and interpret experiential materials with processual and interactive characteristics from the bottom up, refining concepts and clustering categories, and constructing relevant theories through analysis of logical relationships among core categories [**?**]. Semi-structured interviews, conducted accord-

ing to a loosely structured outline, enable researchers to understand respondents' feelings and opinions in a relatively relaxed atmosphere and obtain vivid, detailed, and rich textual materials, which can then be used with grounded theory to abstract relevant concepts and categories [**?**]. This study employs grounded theory and semi-structured interviews to conduct an in-depth exploration of the status and influencing factors of professional identity among publicly-funded medical students.

Methods

1.1 Interview Subjects

Using purposive sampling, publicly-funded medical students from the 2018–2022 cohorts of the Traditional Chinese Medicine (five-year program) Beneficiary Class at Shandong University of Traditional Chinese Medicine were selected as interview subjects, with interviews conducted from December 2022 to March 2023. Sample size was determined based on the principle of information saturation—when no new concepts or categories emerged after 26 interviewees, the sample was expanded to 30 to ensure theoretical validity. Saturation was achieved at 30 participants with no new concepts or categories emerging. Inclusion criteria were: (1) currently enrolled publicly-funded medical students; (2) good communication and language expression abilities; (3) understanding of the research purpose and voluntary participation. Exclusion criteria were: (1) unwillingness to be audio-recorded; (2) interruption during the interview due to study, internship, or other reasons, preventing completion. This study was reviewed and approved by the Ethics Committee of the Affiliated Hospital of Shandong University of Traditional Chinese Medicine, which granted exemption from full review (Approval No.: 2023-0007). All interviewees provided informed consent.

1.2 Interview Methods

Based on the interview outline developed through literature review and data examination, pilot surveys were conducted and expert opinions solicited to refine the final interview guide, which included the following questions: (1) Are you familiar with the policies regarding publicly-funded medical students? How did you learn about them? (2) Why did you choose to become a publicly-funded medical student? (3) Who influenced your decision to become a publicly-funded medical student and how? (4) What is your understanding of the profession of primary-level doctors? (5) Do you have a career plan? What are your plans after graduation? What about after the service period? (6) What factors might influence your future career development? (7) Have your internship experiences influenced your attitudes or views toward primary-level hospitals/doctors? If so, how? What changes have occurred compared to before your internship? (8) Will you choose to take the postgraduate entrance exam in your fifth year? Why? (9) Are you willing to work in primary-level hospitals in the future? (10) Are you proud of your future identity as a primary-level doctor? What would make

you love your future profession more? (11) How do you understand the concept of "professional identity of publicly-funded medical students"? Do you identify with your future role as a primary-level doctor? (12) Do you think a person's sense of professional identity affects their future learning motivation and work attitude? If so, please elaborate on how. (13) If you had the opportunity to choose again, would you still insist on becoming a publicly-funded medical student? (14) Have any people or events changed your views on the profession of primary-level doctors? How did they affect you and what changes occurred? (15) Are you satisfied with the current policies regarding publicly-funded medical students/primary-level healthcare? What do you think relevant departments should do to make you more willing to engage in primary-level medical work?

One-on-one interviews were conducted based on this outline and fully audio-recorded, with each interview lasting 20–60 minutes. After each interview, the interviewer transcribed the content into text and provided feedback to respondents for supplementation and refinement. The interview team consisted of one associate professor, one lecturer, and three master's students. Interviews were conducted in classrooms at the Changqing Campus of Shandong University of Traditional Chinese Medicine, with online interviews used for 2018–2019 cohort students participating in off-site internships. Before each interview, the interviewer explained the purpose and content, obtained consent, and had respondents complete a basic information form (name, gender, age, ethnicity, grade, household registration location, political affiliation, campus position, only-child status, family income, relatives/friends in medical profession, hometown medical conditions, assigned work location and familiarity level).

1.3 Data Analysis Methods

All interview transcripts were imported into NVivo 11.0 qualitative analysis software. Following the Anselm Strauss and Juliet Corbin programmatic grounded theory approach [**?**], data were coded and analyzed through open coding, axial coding, and selective coding [**?**]. Open coding involves line-by-line coding of raw data to extract initial concepts and identify basic categories [**?**]. Axial coding further refines and abstracts the initial concepts and basic categories obtained from open coding to discover main categories. Selective coding identifies core categories from the main categories and analyzes relationships among categories to ultimately form a systematic framework [**?**].

Results

2.1 Basic Information of Interview Subjects

Among the 30 interviewees, 12 were male and 18 were female. Ages ranged from 17 to 24 years (mean 20.7$±$1.70 years): 1 was 17, 3 were 18, 4 were 19, 3 were 20, 9 were 21, 6 were 22, 3 were 23, and 1 was 24. All were of Han ethnicity. Grade distribution: 4 from the 2018 cohort, 6 each from 2019–2021 cohorts, and 8 from the 2022 cohort. Household registration: 17 urban,

13 rural. Political affiliation: 6 CCP members, 3 probationary members, 9 activists, 9 Youth League members, and 3 masses. Campus positions: 13 student union members, 11 Youth League branch secretaries, 1 class monitor, 1 flag team member, 1 discipline committee member, 1 study committee member, 1 course representative, and 4 with no position. Only-child status: 9 were only children. Family income: 7 good, 22 average, 1 poor. Relatives/friends in medical profession: 13. Hometown medical conditions: 3 very good, 10 good, 16 average, 1 not very good. Assigned work location in hometown: 11. Familiarity with assigned location: 5 familiar, 13 somewhat familiar, 12 unfamiliar.

2.2 Open Coding

Open coding extracted 482 initial concepts and 47 basic categories, coded in the form "A+serial number." Examples of initial concepts and basic categories are shown in Tables 1–2 .

2.3 Axial Coding

Based on open coding, axial coding identified 9 main categories: professional ethics, professional status, professional environment, professional emotion, professional competence, professional belief, professional behavior, professional choice, and professional will, coded in the form "B+serial number." Details are provided in Table 3 .

2.4 Selective Coding

Using "influencing factors of professional identity among publicly-funded medical students" as the central theme and focusing on the logical 脉络 of main category core attributes, selective coding formed a typical relationship structure (Figure 1) [Figure 1: see original paper]. The results show that influencing factors of professional identity among publicly-funded medical students consist of six dimensions: career cognition, career behavior, career choice, career will, career emotion, and career belief. Among these, career cognition, career behavior, and career choice are exogenous factors, while career will, career belief, and career emotion are implicit factors.

Discussion

3.1 Influencing Factors of Professional Identity Among Publicly-Funded Medical Students

This study reveals that influencing factors of professional identity among publicly-funded medical students comprise six dimensions: career cognition, career behavior, career choice, career will, career emotion, and career belief. Career cognition, career behavior, and career choice are exogenous factors, while career will, career belief, and career emotion are implicit factors.

Career cognition is a crucial driver of individual professional development, encompassing moral cognition, professional status cognition, environmental cognition, and competence cognition. First, a qualified primary-level doctor must possess good professional ethics, and contract fulfillment awareness is an important manifestation of professional ethics among publicly-funded medical students: "Yes, because the contract location is a primary-level hospital, I must fulfill the contract" and "Because I failed the postgraduate entrance exam, I plan to fulfill the contract after graduation and serve at the assigned primary-level health center" (A23). Second is professional status cognition. Social recognition and economic-material security were frequently mentioned by participants. Approximately one-third of students believed that primary-level doctors, especially Traditional Chinese Medicine practitioners, face social recognition issues, and many expressed concerns about future economic-material security: "Primary-level doctors may still be controversial in today's society… as I said before, I support primary-level doctors and hope citizens will recognize them more and understand their importance" (A28); "The current situation for primary-level doctors in China: low status, low wages, and lack of security" (A28); "Regarding compensation during the service period, some places have monthly salaries as low as 2,000 yuan, which really cannot guarantee a normal quality of life. If we want publicly-funded medical students to stay in towns and townships, we must guarantee basic living needs so they can at least settle down. We are truly grateful for the benefits provided during undergraduate studies and are willing to respond to the national call to improve public health levels at the primary level, but to retain us, basic needs like food, clothing, housing, and transportation must be met—clean and tasty meals, convenient shuttle buses…" (A34). Third is professional environment cognition. In recent years, with improved economic conditions, more patients prefer to visit tertiary Grade A hospitals because they gather the best doctors from provinces, cities, and even nationwide, with the most advanced equipment and high-quality care. In contrast, primary-level hospitals often have incomplete medical facilities, insufficient drug supplies, and uneven doctor quality, resulting in few patients. While some primary-level hospitals have relatively complete medical equipment and comfortable working environments due to local policy support and economic development, most are located in towns and villages with small footprints, unclear departmental divisions, and challenging professional environments: "My mother works at a township hospital. I think the commute is too long—more than half an hour by car—the salary is not high, and there are few days off. I still hope to continue developing at a large hospital after fulfilling my contract" (A25). Finally, there is professional competence. Always considering patients, saving lives; treating patients equally; diligently studying and continuously updating knowledge to improve technical skills; and meticulously diagnosing and treating diseases while remaining calm in emergencies are basic professional competencies doctors must possess: "In some hospitals, the Traditional Chinese Medicine department doesn't highlight TCM characteristics—it seems more focused on selling herbal medicine; some doctors have arrogant attitudes, a sense of superiority, and lack patience. Of course, these are only a few cases, but they leave

a deep impression. Other hospitals and doctors have moral bottom lines and professional competence" and "I believe that lacking professional identity and letting it affect work attitude is very unprofessional behavior, especially for medical workers who should be responsible to patients and hospitals" (A45). These findings indicate that insufficient necessary cognition about the primary-level doctor profession is an important factor affecting professional identity among publicly-funded medical students. Therefore, schools should strengthen professional identity education and training, including research on curriculum systems, teaching methods, and effectiveness evaluation to correctly guide students in forming good career cognition [**?**].

Career behavior refers to typical behaviors in a profession, including basic and extra-role behaviors [**?**]. Basic behaviors mainly include fulfilling essential job requirements, while extra-role behaviors exceed personal requirements and can improve professional efficiency. In this study, the career behavior category formed through axial coding includes professional requirements and work experience. Publicly-funded medical students will primarily engage in general practice where hospital departments are not clearly defined and the audience consists mainly of community, township, and rural residents. Therefore, as future general practitioners, they should broadly learn medical knowledge, develop the ability to diagnose and treat common and frequent diseases at the primary level, consider patients' economic conditions to achieve simple yet effective treatment, and refer complex or severe cases to higher-level hospitals. Compared with doctors at comprehensive hospitals, primary-level doctors have relatively less work pressure but must also undertake infectious disease prevention, health education, chronic disease follow-up, and resident health management: "My parents are primary-level doctors. Sometimes they are very busy, doctor-patient relationships are sometimes good and sometimes bad, public medical knowledge is insufficient, people easily believe in folk remedies, and it's difficult to establish trust in doctors" (A31); "Each doctor can encounter different diseases, departmental divisions are not very clear, there are high requirements for general practice, and elderly people in towns and villages need more patience and careful attention" (A15). These findings demonstrate that understanding of primary-level doctor career behavior also influences professional identity. Therefore, schools should emphasize the importance of continuing education after graduation and establish a relatively complete lifelong education system for general practice to guide primary-level doctors in establishing healthy, positive career behaviors [**?**].

Career choice is the decision-making behavior regarding future occupations based on individual considerations (including personal, family, and social factors). This study shows that reasons for applying to become publicly-funded medical students mainly include family hopes for medical education, perceived respectability of the profession, state-provided staffing, guaranteed employment upon graduation, desire for early economic independence, and ability to reduce family financial burden, as well as current employment difficulties. Therefore, initial motivations for career choice influence professional identity to some extent. At the government level, effective and in-depth publicity of publicly-

funded medical student policies should continue through networks, television, and other channels. At the school level, publicly-funded medical students could be organized to conduct policy presentations at their hometown middle schools during vacations, helping middle school students and parents deeply understand the policy to avoid blind, random, and speculative applications during college entrance exams [**?**].

Career will refers to the ability to overcome difficulties and firmly engage in a profession. In this study, the career will category formed through axial coding includes family emotion, rooting in primary-level practice, and goal awareness. First, family emotion is an important factor influencing career choice: "My parents are healthy, but as they age, they will inevitably develop some illnesses. Publicly-funded medical education can both reduce their burden and use my knowledge to alleviate their suffering" (A9). Second, the guiding role of school education must be emphasized: "Many university teachers have excellent teaching qualities who helped me feel in moments that publicly-funded medical students is the professional direction I want to strive for" (A24). Therefore, teachers should further strengthen the cultivation of awareness about rooting in primary-level practice and guide and strengthen students' determination to contribute to primary-level areas. Finally, firm goal orientation is essential: "Regardless of whether the purpose of love is pure, having goals allows one to devote body and mind; not only will one strive to improve oneself, but it will also benefit the profession and industry" (A43). Thus, the firmness of career will also influences professional identity among publicly-funded medical students.

Career emotion is the psychological collection including professional honor, belonging, and sense of fairness formed on the basis of understanding various occupational attributes. This study shows that publicly-funded medical students' love for and interest in medicine is their original aspiration, saving lives is their mission, they feel a sense of achievement and satisfaction after relieving patients' pain, and they have passion for improving primary-level medical conditions. Schools can guide students to correctly view the primary-level doctor profession through relevant courses. While imparting knowledge and resolving doubts, teachers should focus on enhancing students' aspirations toward the primary-level doctor profession to further internalize it as personal learning motivation and spiritual pursuit, thereby cultivating good career emotions [**?**].

Career belief refers to individuals' judgments, viewpoints, and views about a profession. In this study, the career belief category formed through axial coding mainly includes 11 subcategories: service and dedication, responsibility and mission, firm belief, primary-level needs, saving lives, developing Traditional Chinese Medicine, etc. General practitioners are "gatekeepers" of community residents' health and the cornerstone of national primary-level healthcare. As future general practitioners, publicly-funded medical students should recognize the important significance of primary-level medical work for residents' health and the important value of primary-level medical development for national development, thereby gaining confidence in the profession: "I feel that being a

primary-level doctor can help grassroots people solve disease problems more conveniently and quickly. Although there is no high salary, I can save lives and heal the wounded" (A6); "Primary-level medical resources are relatively scarce, while the elderly population at the primary level is very large and in great need of medical resources. If my efforts can bring improvement, it will be very fulfilling" (A10); "Primary-level doctors are a major need strongly maintained by the state and represent the direction of development. It is glorious" (A38).

In summary, influencing factors of professional identity among publicly-funded medical students consist of six dimensions: career cognition, career behavior, career choice, career will, career emotion, and career belief. Exogenous factors include career cognition, career behavior, and career choice, while implicit factors include career will, career belief, and career emotion. Multiple levels and channels should be utilized to fully leverage publicly-funded medical students' internal drive, strengthen their goal orientation, emphasize the guiding role of family and school education, continuously optimize promotion systems for primary-level doctors, and enhance social resource security to improve their professional identity and overall quality, enabling them to better root themselves in and serve primary-level areas.

3.2 Study Limitations

This study collected information on professional identity among publicly-funded medical students through semi-structured interviews. However, due to certain objective factors, some limitations remain. First, limited by information availability, interview subjects were only undergraduate-level publicly-funded medical students with a limited sample size, thus preventing the construction of a complete theory and limiting generalizability. Second, as qualitative research based on grounded theory, the findings require validation through large-sample studies. Future research should aim to develop measurement tools for professional identity among publicly-funded medical students, conduct large-sample questionnaire surveys, and further validate the accuracy and scientific nature of these findings through empirical research to support general medical talent cultivation and continuously strengthen the primary-level doctor workforce.

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Funding: Shandong Province Graduate Education Teaching Reform Research Project (SDYJG21085); Shandong Province Undergraduate Education Teaching Reform Research Project (Z2021263, Z2022286); Shandong Province Education and Teaching Research Project (2021JXY064); Shandong Province Traditional Chinese Medicine High-level Talent Cultivation Project (Lu Wei Han [2022]

No. 148); Qilu Health and Health Leading Talent Project (Lu Wei Ren Zi [2020] No. 3)

Citation: Qiao X, Yin YT, Luo WJ, et al. Root cause analysis of the influencing factors of professional identity in rural order-oriented medical students: a qualitative research [?]. Chinese General Practice, 2023. [Epub ahead of print]. [www.chinagp.net]

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Conflict of interest: None declared.

(Received: July 13, 2023; Revised: November 22, 2023)

(Editor: Lu Feifei)

Note: Figure translations are in progress. See original paper for figures.