



Identification of Factors Influencing Professional Identity Development in Medical Students at Basic Sciences Stage

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> Abstract

Introduction: Medical education is beyond gaining a certain level of knowledge and mastering a specific set of skill. Medical students should try to improve the self and system, which necessitates personal growth and professional identity development. In this study, we aimed to investigate the factors which contribute to the formation of professional identity of medical students in basic sciences stage and finding out the significance of each factor.

Methods: In this cross-sectional practical survey, semi-structured interviews were done with 10 medical students. The interview results yielded several items, which were used to make a 14-item questionnaire, the validity and reliability of which were verified. The contribution of the items to the factors was verified through factor analysis, the prerequisites of which were KMO and Bartlett test, which were done and approved. The significance of the factors obtained was evaluated and ranked through one sample t-test and Friedman test, respectively.

Results: The result showed that professional identity development in the stage of basic sciences was influenced by several factors, including educational, socioeconomic, personal, and familial ones. Also, the personal factor ranked first, followed by socioeconomic, educational, and familial factors, respectively.

Conclusion: In this study, it was concluded that the participants were more influenced by their own personal attitudes as compared to their familial, socioeconomic, or educational factors. Moreover, the factors which contributed to the professional identity of medical students were not at the same level of significance. To train physicians with high professional identity, medical education authorities are recommended to consider the above-mentioned factors.

Keywords: Professional identity, Basic sciences, Medical students

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Introduction

Medical education is beyond gaining a certain level of knowledge and mastering a specific set of skills (1). That is, in addition to acquiring medical knowledge and expertise, medical students require to excel and demonstrate patient care taking altruism, ethics, and effective communication into account (2). To do so, they require to pay close attention

to the improvement of themselves and the system, which necessitates personal growth and professional identity development. The review of literature on professional identity formation (PIF) in medical students indicates that it is a “multifactorial phenomenon which involves a continuous construction and deconstruction of individual, relational and societal identities. This dynamic nature can be influenced by individual

values and beliefs and their interactions with environmental factors including clinical and non-clinical experiences of medical students” (3).

Jarvis Selinger et al. define professional identity as “the attitudes, values, knowledge, beliefs and skills shared with others within a professional group.” As they explain, identity formation is an “adaptive and developmental process” which consists of both the individual and collective levels and involves psychological evolution and socialization in which a person accounts for participation and performs specific roles in a certain community of professionals (4). As de Lasson et al. indicate, this development occurs during medical education and training, leading to a student’s professional life (5).

However, development of professional identity is not an overnight change; rather, it is a continuous process affected by several factors, one of which is experiences in practice and professional socialization (6). The term ‘socialization’, in its psychological and sociological meaning, is defined as the ways in which students are shaped into members of specific groups in specific cultures (7). In medical context, Haruta, Ozone, and Hamano define it as the process through which medical students mature into a healthcare professional and professional socialization as the process of transforming a beginner into a professional. According to them, the process of socialization in doctors is influenced by such factors as role models, clinical experience, the healthcare system and organizational environment, as well as by the attitudes of colleagues and supervisors towards patients (8).

Attempts have also been made to examine the PIF. A systematic review of the literature was conducted on PIF in the context of internships. Reflection, mentoring, professional socialization, self-efficacy and goal orientation, and critical thinking were found as the components contributing to the professional identity development (9). Shuval (1975) studied professional socialization taking early clinical training into consideration. She viewed that in the professional socialization process, the students (socializees) move forwards into their professional roles and backward into their familiar student role in an alternative manner. For the socializee, both extreme roles in the process are of reward as they gain high motivation and the focus on the long-range goal through the professional role, while, as a student, they enjoy familiarity, ease of performance, and less responsibility (10).

Mathew et al. found that university programs play an important role in the students’ PIF

process, and Becker et al. indicated that students developed an academic perspective during their encounters with the faculty members (11). Other researchers also revealed that attending physicians, residents, and interns appreciated the students who interacted with enthusiasm, diligence, and attentiveness when caring for patients and showed commitment to specific clinical specialties (12, 13). Shuval and Adler revealed that students chose their professional role models and anti-models selectively from among their teachers in various learning contexts as they might fit different patterns of role modeling of active identification, rejection, and inactive orientation (14).

Sinclair states that during the preclinical phase of medical education, when medical students require to complete their theories with practical courses, including hours of dissecting the cadaver, they find insights regarding how to approach their future patients. This is because they find the link they have already established between their contemporary attitudes regarding the cadaver and future patients (12). In Chandran et al.’s study, the cadaver is even regarded as the first patient that medical students need to work with (15).

Other than the roles mentioned above, peer groups also play roles in both preclinical and clinical settings. Throughout their studies, students often engage in informal discussions with peers to share ideas about situations they may find (12). Childhood experiences of illness and health, the experiences gained during basic phase of medical education, personal growth, and an enhancing ability to meet the needs of patients and society, companionship cooperation between colleagues who share similar responsibility and learning from role models as well as role playing, and contacts with and feedback from the patients and their relatives were also important contributors to their PIF (16).

Literature shows that several factors may influence the development of professional identity of medical students. However, most studies have mainly focused on the clinical phase, which follows the phase of basic sciences. The importance of basic sciences is self-evident (17, 18). Though considered emotional and exciting roller coaster journey of education, this stage of medical education not only teaches the medical students to be diligent, committed, and compassionate, but also prepares them for the subsequent stage of clinical practice (18). In this phase, the students start to explore their major and future and consider their personality transformation. Accordingly, the importance of

this phase is not only related to the knowledge acquired by them but also to the emerging identity development. Yet, the factors that contribute to this emergence may not necessarily be identical to those of clinical phase. Thus, the present study aimed at investigating the factors contributing to the professional identity development of medical students in the basic sciences stage and find out the significance of each factor.

Methods

Study Design and Participant

In this cross-sectional survey, semi-structured interviews were conducted with 10 medical students in the 5th semester of basic sciences stage in the international campus of Shiraz University of Medical Sciences to find out what they thought could be contributory to the medical students' professional identity development in the basic sciences stage. The results of the interviews were several contributing items, which gave birth to the construction of the study questionnaire. To content- validate the questionnaire, the list of items was shared with 5 experts of the field and their views were taken into account. The final version of the questionnaire, encompassing 14 Likert items, was approved. As to the structure of the questionnaire, a brief explanation about the goal was provided as well as the optionality to fill out the questionnaire. Age and gender were also asked to be written. The respondents were to rate the degree to which each item might influence the medical students' professional identity development in the basic sciences stage by choosing boxes ranging from very little to very much.

Prior to the administration of the questionnaire, the items were tentatively classified into 4 factors. The final version of the questionnaire was distributed among 41 randomly selected participants on the very day they were to take their last final exam of their basic sciences course.

Data Analysis

For data analysis, SPSS version 16 was used. Though content validity had been performed earlier, Bartlett Test verified the validation, and the reliability was checked through Cronbach α (0.73). Demographic data are provided in a table. Kaiser-Meyer-Olkin (KMO) and Bartlett Test were done, respectively, to check the sampling adequacy for factor analysis and to see whether the data were suitable for factor analysis, which was to examine whether the questionnaire items contribute to the classification of the factors influencing professional identity development of medical students. One sample t-test with the

threshold of 3 (considering the Likert scale of very little influence to very much influence with scores ranging from 1 to 5) was used to check the significant influence of the factors on the professional identity development of medical students. And finally, Friedman test ($P < 0.001$) was used to rank the classified factors.

Results

In this study, as to the participants' demographic data, there were 23 male (56.1%) and 18 female (43.9%) subjects. 17 subjects were 21 years old (41.5%), 20 of them were 22 years old (48.8%), and 4 were 23 or more years old (9.7%).

As to the first research question, the interview results showed that according to the participants, the following items were found to contribute to the development of medical students' professional identity: attending the theoretical courses, corresponding laboratory sessions, having professors as role models, discussing with classmates and peers, competing with classmates and peers, having parents as physicians, having sick relatives and feeling committed to them, having known successful physicians acting as their role model, seeing sick people in need, being ambitious to make money through practicing as a medical doctor, increasing the self-awareness, attending medical conferences, being influenced by the media, and fulfilling childhood dreams.

The abovementioned items indicated that the educational, familial, socioeconomic, and personal factors could contribute to the medical students' professional identity development in the basic sciences stage. The factor analysis confirmed that the items contributed to the classification of 4 factors.

As to the second research question, Table 1 shows the degree to which the factors influenced the subjects' identity.

The result of one sample t-test (considering confidence level of 99%) indicated that except for the factor of family, the other 3 factors (educational, socioeconomic, and personal) significantly influenced the professional identity development of medical students in the basic sciences stage. Moreover, in order to rank the factors, we used Friedman Test result ($P < 0.001$) which indicated that the personal factor ranked first with a mean of 3.01, followed by socioeconomic, educational, and familial factors, with a mean of 2.82, 2.13, and 2.04, respectively.

Discussion

In the present cross-sectional practical survey on PIF among medical students, we utilized semi-structured interviews with 10 medical students in

Table 1: Evaluation of the influence of factors on the medical students' professional identity development (one-sample T-test)

| Factor | Mean±SD | T | P |
|---------------|------------|------|--------|
| Education | 3.43±0.679 | 4.05 | <0.001 |
| Family | 3.28±0.994 | 1.81 | 0.0783 |
| Socioeconomic | 3.80±0.586 | 8.70 | <0.001 |
| Personal | 3.87±0.803 | 6.96 | <0.001 |

the 5th semester of basic sciences stage to find out what the participants thought could contribute to their professional identity development. We aimed to explore the medical students' perceptions of the factors which contributed to the PIF of students at the basic sciences stage and determined whether the contributing factors were of the same level of significance, as viewed by the students. From the results of the interviews, we extracted a number of contributing items, which gave birth to the construction of the study questionnaire which was then content-validated, and the final version of the questionnaire was prepared.

In this study, we found that medical students, at the stage of basic sciences, took care of their personal attitudes toward their professional identity. They sought more awareness through their profession. In the same line, Goldie (2012) states, "Education in its broadest sense is about the transformation of the self into new ways of thinking and relating. Helping students form and successfully integrate their professional selves into their multiple identities is the basis of medical education. Identity has multiple dimensions and is dynamic and relational". As concluded by Goldie, during medical school studies, the students' professional identities are formed and influenced more by the informal and hidden curricula than by formal teaching experiences; this is in the same line with the results of our study (1).

The result of one sample t-test (considering confidence level of 99%) indicated that the factor of family was not significantly associated with PIF. This finding is not in the same line with those of a study conducted by Wahid et al., indicating that PIF of medical teachers in their context suggests that there is a strong association among religious values, family influences, and societal recognition in their PIF (19).

Furthermore, we found that educational, socioeconomic and personal factors significantly influenced the professional identity development of medical students in the basic sciences stage. Our result is in the same line with those of Findyartini et al. who identified three internal factors which were likely to impact PIF among medical students; they include values, abilities and traits, and personal circumstances (2).

Our students believed in the necessity of having known successful physicians acting as

their role model. In the same line, Findyartini et al. found that "to deal with the complexity in the learning environment, medical students and residents emphasized the roles of teachers in their professional development. They value teachers as more authoritative figures who serve as good role models, provide feedback, and nurture students" (2).

In the present study, the students seemed to be sensitive about neither their peers' performance, nor financial aspects of their profession. This is not consistent with the results of another study; the authors showed that during internalization of professionalism, students paid attention to the expected behaviors of medical students from the community, as well as from their teachers (2).

Also, our students paid as much attention to their theoretical subjects as to the success of medical doctors in the external world. The students reported that they found out that they needed to diligently pursue their basic courses in order to evolve into professional doctors, who they should see in society, and be as prosperous as they are. This is in the same line with Findyartini et al.'s findings which showed the importance of external factors, some of which include the curriculum, education system, learning environment, workplace-based learning, and external expectations influenced PIF. According to their participants, curriculum has a crucial role in PIF (2).

As found in the interviews, the medical students stated that visiting sick people, especially their close relatives, seemed to provoke their feeling of commitment. In the same vein, Findyartini et al.'s students highlighted that interacting with standardized patients also assisted them in developing their PIF; they stated that the experience of learning in various hospital settings and healthcare facilities helped them to perceive their roles as medical doctors; also, the environment that made direct learning from contact with patients possible was considered vital to achieving competence and contributed to development of their professional identity (2).

The results of our study are also consistent with those of Bell et al. According to them, real patients provide authentic learning experiences that assist them in developing their cognitive and metacognitive skills, as physicians who need to

deal with patients' problems comprehensively in future (20). In addition, as highlighted by Cruess et al., through practice in a clinical setting, the students' performance is directly observed. This real patient exposure in hospitals, students learn how to act as a medical doctor (21).

In comparison to our results, Japanese students in the early stages of their socialization process experienced not only realization as doctors, but also organizational socialization; they adapted to the hospital in which they worked as a resident. Their study revealed the chronological patterns of the professional socialization of Japanese doctors including their hospital training, using educational theories (4). As highlighted by Cruess et al., "Socialization (involving role models and mentors, clinical and non-clinical experiences, and a community of practice) is a core process in PIF" (21). Likewise, as viewed by Sadeghi Avval Shahr et al. in a study conducted in 2019, socialization is a "nonlinear, continuous, interactive, transformative, personal, psychosocial, and self-reinforcing process that is formed through internalization of the specific culture of a professional community, and can be affected by individual, organizational and interactional factors" (22).

Moreover, as Mathew et al. emphasize, university programs have a critical role in the students' formation of professional identity; Therefore, it is of great importance to understand professional identity at this stage of students' development. However, as concluded by them, there was little evidence underpinning the psychometrics of professional identity measure (23).

Medical educators in our country need to conduct studies to find the status of their students' professional identity, using different dimensions of PIF, such as the instrument created by Tagawa, which is a useful indicator of medical trainees' personal and professional development and socialization. In this way, they can help the students experience their future practice as a physician. According to Tagawa, "Experience in playing the role of a physician might facilitate medical trainees' PIF (24).

Overall, support from the medical school is essential in students' adaptations and professional identity formation. Accordingly, Fidyartini et al. emphasizes that authorities should mentor and create environments where students can discuss their concerns, doubts, and dilemmas; it is also suggested that these measures should be taken to assure adequate facilitation of medical students' professional development during their medical training years (2). In conclusion, in this study it was found that the factors that lead to

the medical students' professional identity are not of the same significance. According to the results, educational, familial, socioeconomic, and personal factors could contribute to the medical students' professional identity development in the basic sciences stage. The medical education authorities and curriculum writers are suggested that the above-mentioned factors should be taken into account, so that they can train physicians with high professional identity; in turn, it will benefit the patients. As highlighted by Mathew et al., what is mostly needed to be studied and considered by authorities in medical programs is that in the process of selecting the most appropriate professional identity measure in future, they should consider psychometric evidence, applicability to one's own context, and methodological quality (23). Moreover, Bridges suggests that teachers of medicine should consider how collaborative working can be maximized as a means for students to explore together their subjects, profession, selves, and others when they start their journey in becoming professional doctors (25). Further studies are suggested to be conducted using more recent scales to help plan for our medical students' development of professional identity, such as that developed by Chin et al. (9). It is suggested that a recent model developed by Afshar et al. called "Meta Static Structural Model" should be compared and contrasted by future researchers with the model developed in this study as well as other current models (26).

Conclusion

The results of this study can be used as a starting point to research, develop, and use measures suitable to our Iranian context; in this way, we can plan for professional identity formation and monitor and measure our medical students' learning outcomes, regardless of whether that student is in the stage of studentship, externship, internship, or in pre-employment training.

Like any other research, our study had some limitations. First, we conducted this study in only one medical school; therefore, the results cannot be generalized to other medical settings. Moreover, we have analyzed the data using interviews with the students at a single point in time. Thus, the findings cannot show the process of or changes in PIF. Nevertheless, we were able to find the factors contributing to our students' PIF and the significance of each of them.

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participated in this study.

Authors' Contributions

All authors contributed to the discussion, read and approved the manuscript and 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 resolved.

Conflict of Interest

Nasrin Shokrpour, as the English Editor, was not involved in the peer-review and decision making processes for this manuscript. A team of independent experts were formed by the Editorial Board to review the article without her knowledge.

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