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Reframing learning interactions: transforming professional identity among students of traditional Korean medicine

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Abstract

Background Understanding the construction of professional identities is a key challenge in medical education. Advancing a global understanding of medical professionalism requires the recognition of the general principles and sociocultural particularities that shape professional identities across diverse medical traditions. We investigated how students of traditional Korean medicine develop a professional identity through transformative learning within a specific sociocultural context. The research questions are as follows: (1) How does the professional identity of students of traditional Korean medicine develop? (2) In the context of professional identity formation, how do students of traditional Korean medicine construct meaning from their cognitive (content dimension of learning), affective (incentive dimension of learning), and social (interaction dimension of learning) learning experiences?

Methods We applied grounded theory to explore how students of traditional Korean medicine construct professional identities through various learning experiences. Twenty-one fourth-year students of traditional Korean medicine participated in in-depth interviews, followed by initial, focused, and theoretical coding.

Results In the incentive dimension, students of traditional Korean medicine experienced resistance, adaptation, dissatisfaction resolution, anxiety, conflict, or reproduction. In the content dimension, they developed expertise through a formal curriculum based on unfamiliar East Asian philosophy that included classical texts and Chinese characters. Clinical practice and volunteer work helped them deepen their understanding of traditional Korean medicine and build confidence. In the interaction dimension, they encountered a closed and individualistic school culture, had patient interactions through volunteering, interacted with role models, and confronted negative perceptions of doctors of traditional Korean medicine in online communities. The most significant finding was that the interaction dimension was divided into internal and external interactions based on learners' interpretations and meaning-making perspectives. The findings show that professional identity can only be fully formed when both types of interactions are experienced.

Conclusions The insights gained from traditional Korean medical education have valuable implications for global medical education. By revealing the general principles and culturally specific dynamics of professional identity formation, this study contributes to a deeper understanding of how identity is shaped within pluralistic medical education environments, in which diverse medical paradigms, learning experiences, and cultural values intersect.

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Trial registration Not applicable.

Keywords Professional identity formation, Traditional Korean medicine, Transformative learning, Learning interaction, Constructivist grounded theory

Background

A central question in medical education is how students develop distinct professional identities, even when they follow the same structured curriculum [1, 2]. Although students collectively acquire expertise through formal instruction, their perceptions of what kind of professionals they are becoming may diverge significantly [2]. Thus, professional identity is not simply transmitted through the formal curriculum but is actively constructed through diverse learning experiences and individual meaning-making, which learners integrate into their personal narratives.

Medical education prominently focuses on professional identity formation (PIF), recognizing that becoming a doctor involves more than clinical skills [3, 4]. Professional identity refers to an evolving self-concept that develops as individuals internalize the values, norms, and characteristics of the profession, ultimately leading them to think, behave, and feel like doctors [4]. PIF, which often emerges in undergraduate education, involves shaping a self-concept aligned with professional attributes and values [4]. Previous studies identified various learning experiences that influence PIF, including role models [5], communication with patients [6], participation in learning communities [7], early clinical exposure [8], and emotional development [9].

In South Korea, education in traditional Korean medicine (TKM) also emphasizes PIF as a core competency for future practitioners [10, 11]. TKM is a nationally recognized healthcare system that has developed over 5,000 years and is rooted in practices such as acupuncture, herbal medicine, and Sasang constitutional medicine [12]. Article 2 of the Medical Service Act in South Korea classifies TKM doctors as healthcare professionals licensed by the Minister of Health and Welfare, along with physicians responsible for providing health guidance and treatments based on TKM. TKM education, which is provided by colleges of Korean medicine, is institutionally regulated, with nationally licensed instructors, and it operates in parallel with conventional medical programs. In this regard, Korean medicine colleges have increasingly recognized the importance of PIF, while considering the professional characteristics of TKM doctors, and have begun to place greater emphasis on fostering PIF.

The standardized six-year curriculum situates TKM education at the intersection of traditional medicine and professional training, thereby creating a unique challenge for PIF. Having typically been trained predominantly according to science-based curricula during high school,

TKM students often experience confusion when first formally exposed to TKM grounded in Eastern philosophy [13, 14]. Their academic stress is further intensified by heavy coursework, test anxiety, and concerns over grade repetition [15]. Unlike most medical students who pursue residency after graduation, many TKM students enter clinical practice without sufficient postgraduate training, which is a significant concern [16]. Although TKM education has expanded institutionally, concerns persist regarding the lack of qualitative evaluation [17] and the growing demand for graduate competencies suited to contemporary healthcare systems [18]. These structural and cultural characteristics of TKM education are expected to significantly influence the PIF of TKM students, thereby underscoring the need to investigate how learning experiences contribute to this process.

TKM education recognizes the importance of professional identity and emphasizes clinical skill training that highlights patient interactions and communication [19]. However, prior studies have not examined in depth what TKM students actually learn and reflect upon within their unique learning experiences or how they transform students into professionals. This study aimed to address these gaps by exploring TKM students' learning experiences and PIF.

Transformative learning theory offers a valuable lens for understanding how TKM students develop their professional identities. Transformative learning entails a cognitive reorientation that changes how individuals interpret their experiences and the world [20]. Building on this foundation, Illeris [21, 22] redefined transformative learning as a multidimensional process including content, incentive, and interaction dimensions, linking learning outcomes to "identity change." The content dimension includes knowledge, skills, understanding, insights, and reflection. The incentive dimension encompasses affective factors, such as motivation, feelings, and attitudes, that persist throughout the learning process. The interaction dimension highlights the fact that learning begins within a specific context. This includes the social aspects of learning, such as interactions with others and the environment. The holistic view of transformative learning [21, 22] reconceptualizes learner change as identity development that integrates cognitive, affective, and social aspects.

From a transformative learning perspective, the professional identity of TKM students is shaped not only through the acquisition of expertise, but also through diverse learning experiences. Students encounter TKM

in both formal and informal contexts, including lectures, clinical training, camps, study groups, and volunteer work [23, 24]. However, the contribution of these experiences to TKM students' PIF has not received much attention. Earlier research has been limited to basic evaluations of educational satisfaction, career choice research that does not consider its connection to students' learning experiences, or career characteristic studies of pre-medical students whose professional identities are yet to be formed [14, 17, 25].

We employ grounded theory as a qualitative method to understand PIF from a transformative learning perspective. The authors conducted in-depth interviews with 21 fourth-year TKM students in their final semester. This study contributes to the expansion of the identity framework from a learning perspective by offering suggestions on how learning experiences contribute to the construction of identity within sociocultural contexts. Exploring students' learning experiences and identity development within professional healthcare education is expected to have practical implications for the broader medical field.

Methods

This study qualitatively explored PIF among TKM students. Grounded theory was selected because of its strength in inductively developing a theory based on participants' experiences with a specific social phenomenon [26]. This study aims to generate theoretical insights by identifying recurring patterns and social interactions.

Adopting Charmaz's constructivist grounded theory [27], which highlights the co-construction of meaning between researchers and participants, we employed key methodological strategies, such as theoretical sampling, theoretical sensitivity, theoretical saturation, and the constant comparative method [27, 28]. This approach recognizes multiple realities that are shaped by social interaction and situated within specific cultural contexts [27, 29]. Thus, it is particularly well-suited for investigating complex and subjective phenomena such as identity formation.

While identity theories have offered useful categories and developmental stages [30, 31], they often fall short in capturing the situational and complex nature of individual identity formation. Even learning-based perspectives provide meaningful insights but remain insufficiently integrated with models of identity formation.

In this middle-range context, in which prior research was substantial, yet theoretically fragmented, constructivist grounded theory was adopted as a suitable theoretical framework to refine and extend our understanding of PIF. Accordingly, we applied grounded theory to explore the meaning of learning experiences in PIF among TKM students within the sociocultural context of South Korea,

with the aim of contributing to identity theory development from a learning perspective.

Research participants and setting

We employed theoretical sampling to recruit research participants. First, fourth-year TKM students in their final semester who shared the same formal curriculum and had completed most of the coursework were selected, which allowed for a meaningful comparison of differences in PIF. Within this group, the second criterion was the inclusion of students who possessed a range of learning experiences. These included extent of clinical experience, participation in career-related activities, level of career exploration, future career intentions, and pre-university educational background. Including students with varied profiles was intended to extend the emerging conceptual categories, capture a broader range of interpretive perspectives, and enhance the analytical depth of the study.

To verify whether these conditions were being met, a preliminary interview was conducted with fourth-year students of College of Korean Medicine at University A. The interview confirmed that within the six-year curriculum, clinical training was carried out for about two years, beginning in the third year. In addition, most students had participated in TKM volunteer work for over a year. It was also confirmed that, depending on individual interests, the students engaged in various career-related learning activities both inside and outside of school, including study groups, seminars, academic conferences, special lectures, and visits to TKM clinics and camps.

Based on a preliminary investigation, the students at University A shared a common curriculum while demonstrating variations in how they engaged in learning activities. This indicates that the cohort provided a suitable context for examining within-curriculum differences in the students' PIF.

The participants included 17 males and 4 females ranging from their mid-20s to mid-30s. Regarding their high school academic background, 10 had followed the math and science track, while 11 had pursued the liberal arts track. Most of the participants (17) had taken the National University Entrance Examination before attending College of Korean Medicine.

The participants' postgraduation career plans varied. Immediately after graduation, seven, five, three, and one intended to become medical specialists, trainee doctors, deputy clinic directors, and general practitioners, respectively. Although most of the participants identified becoming a general practitioner as their ultimate career goal, only one participant intended to pursue this goal immediately after graduation. Others indicated intermediary roles, such as specialist training, internships, deputy directorships, and providers of public health services.

Among the male participants, nine intended to serve as public health doctors as an alternative to military service, and five had not yet decided on their future career paths after completing their service. To ensure the participants' anonymity, the names of the schools and other personal information were excluded.

Data collection

The authors developed theoretical sensitivity [27, 28] that enabled them to interpret the meanings and relationships embedded in the qualitative data. They began by collecting background information from College of Korean Medicine websites, entrance exam-related news articles, and literature on TKM education.

To strengthen the credibility and interpretive coherence of the findings through methodological triangulation, a wide range of documentary sources related to TKM education were used as comparative references during the data analysis. A literature review provided an overview of the historical development of Korean medicine colleges, current school admission structures, and the six-year curriculum of TKM education. In addition, the accreditation standards of the Institute of Korean Medicine Education and Evaluation, national licensing examination and specialist training pathway, and TKM Doctor Competency Model were examined.

Education in Korean medicine colleges, which began in 1948, continues to expand quantitatively [32]. As of 2020, there were 11 colleges of Korean medicine in South Korea, along with one national graduate school of Korean medicine [33]. The total number of admissions to Korean medicine colleges has been approximately 720 over the past five years.

The basic structure of the Korean medical college curriculum is as follows [34]. TKM programs consist of a six-year curriculum, including a two-year pre-medical course and a four-year medical program. Common coursework in domestic colleges of Korean medicine includes subjects in Korean medicine, such as Korean Medical Chinese, Introduction to Korean Medicine, Medical History, Korean Medical Classics, Preventive Medicine, Acupuncture and Moxibustion, Formula Science, Herbal Pharmacology, Shanghanlun, Korean Medicine Physiology, Korean Medicine Pathology, and Korean Medicine Diagnostics. Subjects in "basic biomedicine" include Medical English, Biochemistry and Lab, Anatomy and Lab, Biomedical Physiology, Biomedical Pathology, Histology, Pharmacology and Lab, Medical Law, and Radiology. The course in "clinical Korean medicine" includes Hepatology, Gastroenterology, Cardiology, Pulmonology, Nephrology, Acupuncture and Moxibustion, Obstetrics and Gynecology, Pediatrics, Dermato-Ophthalmology-Otorhinolaryngology, Neuropsychiatry, and Sasang Constitutional Medicine.

Upon completing the coursework, TKM students become eligible to attend the national licensing examination held annually by TKM practitioners. Successful candidates obtain a national license and may pursue specialty training. Specialty tracks include eight fields: Internal Korean Medicine, Korean Medicine Obstetrics and Gynecology, Korean Medicine Pediatrics, Korean Medicine Neuropsychiatry, Acupuncture and Moxibustion, Ophthalmology, Otolaryngology, Dermatology, Korean Medicine Rehabilitation, and Sasang Constitutional Medicine [35]. After completing a one-year internship, trainees apply for the desired specialty and complete a three-year residency at a certified Korean medicine hospital. Those who pass the board examination at the end of their residency earn certification as specialists.

The competency model for TKM doctors developed by the Institute of Korean Medicine Education and Evaluation includes five core competencies: providing optimal care, effective communication, professional development, social responsibility, and efficient healthcare management. Within the category of professional development, professional identity, defined as a reflection on one's knowledge, attitudes, and values as a TKM practitioner, is included as a sub-competency [36]. The competency model illustrates the fact that TKM education has shifted beyond transmitting knowledge to fostering responsibility, professionalism, communication skills, and managerial competence, thereby reinforcing the development of professional competencies and identity.

Drawing on a theoretical framework grounded in prior studies on TKM students' professional identity and learning experiences, along with a preliminary investigation of the current status and curriculum of TKM education, we developed semi-structured interview questions. Tables 1 and 2 present the data collection framework and interview questionnaires, respectively.

In grounded theory, the sample size is determined by the analytical requirements of the study. Prior literature suggests a typical range of six to thirty-five participants, with saturation serving as the primary criterion for discontinuing data collection [37]. Data collection was concluded when theoretical saturation was reached, meaning that additional data did not contribute to further elaboration, bring new insights to light, or expand emerging categories [38]. The point of theoretical saturation varies depending on the specificity of the research question, sensitivity of the phenomena, and expertise of the researchers [39].

In determining the appropriate point to conclude data collection, we drew on the saturation decision protocol proposed by Francis and colleagues [40]. An initial analysis sample was used to conduct the first round of interviews to generate preliminary codes and categories, after which a second round of interviews was conducted

Table 1 Data collection framework

Research Questions	Required Information	Data Source
Changes in professional identity from students to future professionals	· Understanding students' perceptions of TKM doctors · Motivations for entering College of Korean Medicine · Specific career path after graduation · Reasons and motivations for choosing the career path · Exploring how TKM students perceive the role and meaning of TKM doctors after entering the school · Identifying the competencies, values, and attitudes students consider essential for professionals · Comparing students' initial motivations for entering College of Korean Medicine with their current perceptions of the profession · Investigating how TKM students develop their professional identity as future professionals	Interviews, College of Korean Medicine websites, and other documents
Learning experiences of TKM students	· Exploring learning experiences of TKM students across three dimensions: • Content (cognitive): traditional Korean medical knowledge and skills, students' understanding and reflection • Incentive (affective): interests, motivations, emotional challenges, feelings, and attitudes toward TKM learning • Interaction (social): school culture, role models, encounters with patients during clinical practice or volunteer activities, social perceptions of TKM doctors	

to examine whether new conceptual insights continued to emerge. Data collection continued until several consecutive interviews yielded neither new codes nor further elaboration of emerging categories.

In the initial stage, the authors examined the participants' overall educational experiences by comparing them with background information previously gathered on the current status of Korean medicine colleges, the TKM curriculum, and typical educational experiences. The interviews also aimed to identify distinctive personal learning experiences not captured in documentary sources. In grounded theory, which employs theoretical sampling and abduction, the authors conducted a preliminary analysis of participants' responses concurrently with the data.

The analysis revealed that, despite being academically high-achieving students, many lacked confidence in TKM and expressed anxiety about their future careers, even when they had a clear plan to become TKM doctors after graduation. This finding indicates a weak

Table 2 Interview questions

Category	Interview Questions
Students' perceptions of professionals	· What motivated you to enter College of Korean Medicine? · What specific career path do you hope to pursue after graduation? · What are your reasons and motivations for choosing that career path? · What are the most important factors you consider when choosing a career? · What specific plans have you made to achieve your desired career path?
Learning experiences of students of Traditional Korean Medicine	· Which class during your studies has been the most impressive to you, and why? · What was the most memorable experience you had while participating in clinical practice? · What specific learning experiences related to your major have you engaged in during your studies? (e.g., volunteer work, study groups, academic conferences, hospital visits, etc.) · If you have had a memorable encounter with a patient, what was it like specifically? · How would you describe your role model as a doctor of traditional Korean medicine or as a professional in your desired field? · How would you describe the atmosphere and culture within College of Korean Medicine or among doctors of traditional Korean medicine? · If there are any special perceptions that people around you have about students of traditional Korean medicine or traditional doctors, what are they? · What were the most challenging and the most rewarding aspects of studying traditional Korean medicine or preparing for your career?
Professional identity formation as a future professional	· Compared to before entering College of Korean Medicine, have there been any changes in your perception of doctors of traditional Korean medicine? · What do you think is the most important quality that a future professional should possess? · What is your ideal image of yourself as a future professional? · What goals and plans do you have after you become a professional? · When comparing before and after you entered College of Korean Medicine, have there been any changes in your values as a future professional?

association between academic performance in the formal curriculum and the development of professional identity. The participants consistently explained that their lack of confidence and weakened development of their professional identity were largely influenced by negative discussions about TKM in anonymous online communities. They appeared to be more strongly influenced by external interactions in online spaces than by formal education, shaping their perceptions of TKM doctors.

Given the study's aim to extend the existing theories of PIF by examining TKM students' learning experiences, it was necessary to closely investigate the specific causes,

Table 3 Initial coding: online discourse about TKM Doctors and responses

Excerpt 1. Student 19, male, math and science track, repeated the entrance exam, hopes to enter residency after graduation		Excerpt 2. Student 16, male, liberal arts track, repeated the entrance exam, hopes to work as a public health doctor after graduation	
<i>In a way, you could say it feels like an attack from the outside. People keep bashing us, so I wonder why they criticize us like this.</i>	Questions regarding the negative online discourse about TKM doctors	<i>The word "agitation" feels a bit extreme, but it feels somewhat similar. I think approximately half of the students are like me, I mean, not really for or against TKM.</i>	No direct contact with online discourse
<i>I wanted to study hard. To be honest, TKM doctors haven't stayed silent on online communities from the beginning.</i>	Confrontation in relation to negative online discourse	<i>It seems that more than half of the students were like me, but the other half actively follow the news or whatever comes up. When those students talked about such things during breaks, even those who originally had no opinion began to form their own thoughts.</i>	Interaction within the TKM school (conversation)
<i>Watching them, I thought that I wanted to study hard, join the ranks of those admirable people, protect my juniors, and become that kind of person.</i>	Formation of a sense of belonging	<i>And when they talk about it, even students who didn't care much start to get influenced.</i>	Spread of online discourse within the TKM school
<i>To do that, we need at least some basic knowledge. Even if people say that in TKM school you just need to avoid failing and repeating a year, you still have to know things in order to respond, and later, when you actually treat patients.</i>	Motivation to study	<i>If someone keeps bringing up negative stuff, those who hear it all the time may end up thinking negatively, too.</i>	Reproduction of negative online discourse

processes, and motivations underlying the characteristics observed in the participants. Therefore, further interviews explored whether interactions in online communities were common experiences across participants and examined in depth how TKM students formed their learning experiences and identities both inside and outside school.

A total of 21 fourth-year TKM students from University A who voluntarily agreed to participate were ultimately included in the study. The interviews lasted approximately 60–90 min. All interviews were conducted in Korean and recorded with the consent of the participants. Theoretical saturation was reached after analyzing the data from these 21 participants, indicating that additional interviews were unlikely to yield further conceptual insights.

Data analysis

The constant comparative method was applied throughout the coding process to iteratively compare new data with existing codes and categories, ensuring that theoretical refinements were grounded in the participants' experiences. Additionally, memos were written during and after coding to capture emerging insights and trace conceptual development. Through an analytical process, we identified core categories related to TKM students' PIF and their learning experiences within their sociocultural context.

We employed initial, focused, and theoretical coding [27]. The initial coding involved examining the meaning of the data and identifying the categories. Among the various initial coding approaches, incident-to-incident coding [27] was employed in this study. By comparing incidents within the interview data collected, the analysis

Table 4 Focused coding: confrontation with and reproduction of online discourse

Focused Code	Interview Data
Confrontation with online criticism	<i>Student 11: It's really tough to see those criticisms online after studying and working hard for six years—memorizing, learning, and taking countless exams. We're not doing all of this just to hear things like that. So I think it's quite exhausting.</i>
Reproduction of online discourse	<i>Student 15: TKM doesn't give you clear answers like Western medicine does. So, when you're already struggling and then see people online trashing it, it really hits you. Some students even start talking down about TKM themselves, almost like they're anti-TKM.</i>

explored research-related ideas and identified the properties of the concepts that emerged from the data.

Several categories relevant to the research questions were identified in the initial coding process. These included motives for entering Korean medicine colleges among students from either math and science or liberal arts tracks, perceptions of TKM doctors, interest in and challenges associated with studying TKM, experiences in clinical practice and volunteer activities, the influence of role models, online discourse about TKM doctors and responses, considerations regarding career choices after graduation, and the goals that students hoped to achieve as future TKM doctors.

Focused coding entailed reviewing significant codes to refine the core categories and extract key conceptual attributes. Compared with the initial coding, it is more directive, selective, and conceptual [27]. Examples of the coding processes are shown in Tables 3 and 4.

Theoretical coding integrates categories by identifying relationships and connecting them to relevant theoretical concepts, thereby enabling the development of tentative theoretical insights. Although Glaser proposed a

set of theoretical coding families, categories related to “agency, action, power, networks, and narrative” were notably absent from the typology [27]. As later noted in the literature [28], researchers recommended not being constrained by preset coding families but exploring theories across diverse fields to identify theoretical codes embedded within their data. In this study, theoretical coding was conducted by prioritizing the empirical data rather than applying preset coding families. The analysis focused on identifying the theoretical codes that best reflected the relationships among emergent conceptual categories. The coding categories are presented in Table 5.

To enhance the trustworthiness of our analysis, we followed the criteria of credibility, transferability, dependability, and confirmability [41]. First, credibility refers to internal validity in quantitative research, that is, whether the study accurately represents the phenomenon and reality. To create a comfortable interview atmosphere, each participant could freely choose the interview location and time according to their preferences. Additional follow-up confirmation was conducted when ambiguities emerged during transcription or when further clarification was required.

Second, transferability, which corresponds to external validity in quantitative research, concerns whether the findings can be meaningfully applied to contexts beyond the study and is recognized as relevant by readers. To enhance transferability, two TKM students who did not participate in the study were asked to review the findings and assess whether the results resonated with their subjective experiences.

Third, dependability refers to the extent to which similar results could be obtained if the study were replicated with comparable participants. Two faculty members specializing in education reviewed the grounded theory on two separate occasions during the progression of the study to ensure methodological rigor and coherence. Additionally, detailed descriptions of the research design, data collection, and data analysis procedures were provided to ensure dependability.

Fourth, confirmability emphasizes minimizing researcher bias throughout the research process. Rather than drawing conclusions based on preconceptions, we sought to understand the participants’ learning experiences and professional identities in accordance with grounded theory procedures. Triangulation was employed by comparing interview transcripts with the researchers’ memos as well as reviewing documents and publicly available reports on TKM education, online materials, and newspaper articles. Furthermore, a colleague researcher with experience in vocational education studies involving university students reviewed the

Table 5 Coding categories

Initial Codes	Focused Codes	Theoretical Codes
· Math and science track students (lower-than-expected scores, limited awareness of TKM and conventional medicine) · Liberal arts track students (higher-than-expected scores, anxiety and concern about their future career) · Students repeating entrance exams (military service, mismatch in aptitude, unstable future)	Motivations for applying to TKM school	PIF becoming visible through personal narrative-based decision-making
· Desire for a TKM license, profession, work–life balance · Importance of aptitude over grades · Necessity of Eastern philosophical perspective	Change of perception of TKM doctors after entering school	
· Clear career awareness · Career postponement (public health doctor) · Consideration of alternative careers outside school	Career decision-making after graduation	
· Encountering classical TKM texts, Chinese characters · Dissatisfaction with rote learning and exams · Distrust or rejection of TKM knowledge	Resistance when confronted with unfamiliar TKM practices	Transition from student identity to professional identity based on learning experiences
· Experiencing clinical work in an authentic context · Sense of responsibility for patients · Meaning, value, and calling of the profession	Adaptation to TKM based on clinical experiences	
· TKM practitioners expanding traditional boundaries · Integrating TKM with modern science · Rejecting conservative attitudes as TKM doctors	Resolution of dissatisfaction through role models	
· Closed TKM school culture with limited interaction · Individualistic culture shaped by competition in constrained career pathways	Anxiety caused by closed, individualistic school culture	
· Conflicts with or reproduction of negative online criticism about TKM · Conflicts with other medical professions	Conflict or reproduction of public online opinions	

findings to check whether any aspects of the participants’ responses had been overemphasized or overlooked.

The findings were translated from Korean to English by the authors and subsequently reviewed using a professional translation system provided by the authors’ affiliated institutions. To ensure accuracy and preserve cultural nuances, translated excerpts were subjected to a multistage verification process involving three independent reviewers. The back-translation was conducted by a bilingual researcher with a doctoral degree in English education. To ensure semantic and conceptual equivalence, the translated and back-translated versions were

reviewed by two experts: a colleague researcher specializing in education and a licensed TKM doctor with three years of clinical experience.

Results

Admission: stability over exploration

The participants' decisions to enter College of Korean Medicine were largely influenced by their university entrance exam results and their belief that medicine offers job security. Rather than exploring the role of the profession, they viewed it as a reliable path to a stable future.

Among the participants who had followed a high school curriculum focused on math and science subjects (commonly referred to in South Korea as the "math and science track"), 7 out of 10 initially intended to apply to medical schools. When their entrance exam scores fell short, they turned to TKM as a realistic alternative. With little knowledge of how TKM differs from conventional medicine, they viewed TKM as the second-best route for those who had missed the mark.

To be honest, most of us in the math and science track were thinking the same way at that time. We all wanted to get into medical school. (Student 1)
Back then, medical, dental, and TKM schools were where the top students went. I wanted to become a medical doctor, but my grades weren't high enough. I didn't really care about the difference between Western medicine and TKM at that moment. (Student 2)

Among those who had followed a high school curriculum focused on humanities and social sciences (commonly referred to in South Korea as the "liberal arts track"), most had not initially planned to pursue a career in TKM. For 8 out of 11 students, the decision came after receiving unexpectedly high scores on the university entrance exam. The appeal of a license-based profession, perceived as stable, played a key role in shaping their choices.

I wasn't sure how stable my future would be with a liberal arts degree. I'd never even considered being a TKM doctor before, but I chose it because the job seemed much more stable. (Student 6)

For some students, especially those who were not actively exploring career paths, choosing to attend Korean medicine college was a way to ease the discomfort of uncertainty. Even in the absence of deliberate career planning, the structured pathway to licensure offered by the TKM curriculum provided psychological relief.

I'm not the kind of person who actively seeks things out. When my dad suggested TKM school, it just

felt right. I mean, if I just followed the curriculum, I could get licensed without having to figure out everything on my own. (Student 16)

During school: learning experiences as a TKM student

Resistance: encountering unfamiliar TKM practices

In the early stages of TKM education, most of the participants engaged in little prior exploration of the field beyond a vague perception of TKM as part of the broader medical domain. They felt confused, resistant, or even shocked when they encountered unexpected or unfamiliar aspects of the curriculum.

In my first year, Chinese characters took over my life. I had to read, memorize, recite, and even write them with a brush! I couldn't even tell if I was in a Chinese literature department or a TKM school. I just wanted to learn something medical, but it was all Chinese characters, nonstop. (Student 1)
I remember taking the blank paper test on Mencius in my midterms. I seriously considered dropping out the night before the exam. (Student 4)

The TKM content differed from the science-based learning they had become accustomed to in high school. For several of the participants, the East Asian philosophical foundations of TKM were difficult to comprehend, often giving rise to frustration or resistance.

It was tough to wrap my head around the concept of "Ki-hyeol" instead of something like cells. (Student 2)

Most classes required students to memorize classical Chinese texts and traditional medical literature within a short period without a connection to clinical practice. This requirement made meaningful engagement with studies on TKM even more difficult.

The biggest problem is that we have to memorize everything blindly. It's not motivating to be told to memorize them without knowing how they're actually used in clinical settings. (Student 14)

However, the participants gradually overcame the initial challenges they faced while studying TKM. As their understanding deepened, they began to interpret TKM concepts as tools for making sense of their clinical experiences.

For instance, Student 4 described a turning point when the professor framed the TKM concept as a symbolic expression of a cluster of symptoms. For Student 20, classical texts represented meaningful frameworks for understanding human life and treating patients.

It wasn't that "Ki-heo (Qi deficiency)" was literally lacking. The professor explained it more like a symbol for a set of symptoms. That really changed how I saw TKM. (Student 4)

Mencius helps us understand people. Mind and body are connected, and by reading those texts in depth, I think they can have meaning in practice later on, like offering psychological guidance to patients. (Student 20)

Adaptation: understanding of TKM through practicum

Through clinical practice, volunteer work, and medical camps, the participants encountered TKM in a clinical setting for the first time. These experiences enabled them to develop an understanding of TKM. What initially felt like confusion or resistance began to shift toward growing confidence, responsibility, and motivation to learn.

None of my classmates are actually sick. But when you start doing tests on real patients during practicum, that's when you finally see actual signs, like, "Something's wrong on that side." (Student 18).

When they (patients) came back saying they felt better after treatment, that's when I felt truly fulfilled. I mean, I'm not a doctor—at least not yet—but as a TKM student, it made me genuinely proud. (Student 18)

Most of the participants engaged in a faculty-supervised volunteer program that provided a low-pressure environment for clinical learning. They noted that the patients in the volunteer setting were aware that they had been treated by their student doctors. The sense that patients were more approachable and "less like customers" helped create an atmosphere of emotional safety and ease.

Luckily, since the patients knew it was volunteer work, they weren't as demanding and felt less like customers. It was a much more relaxed atmosphere overall. (Student 2)

Although some students initially approached clinical practice with anxiety and nervousness, repeated exposure helped them to build confidence and develop a sense of responsibility as future TKM doctors.

Honestly, when I first saw patients, I was just really nervous. Since most of them were older, if I made a mistake, I could make things worse. It made me realize I needed to study harder. (...) So, I went to the four-night, five-day camp where I could just focus on practicing acupuncture. It didn't make me an expert

or anything, but it helped relieve my anxiety. (Student 1)

For several participants who had doubts about TKM, hands-on clinical experience marked a turning point. What they had once viewed with skepticism began to seem credible and meaningful when encountered in therapeutic practice.

I got to see firsthand how doctors actually examine patients, provide treatment, give guidance, and even make prognoses. And something just clicked for me. Even my peers who were skeptical about TKM were impressed, like "Wow, that's pretty cool!" (Student 1).

Dissatisfaction resolution: seeking role models beyond tradition

Several of the participants described being inspired by role models who approached TKM as a field of ongoing growth, rather than as a static body of knowledge. Their admiration for role models engaged in modernization and interdisciplinary work reflected both dissatisfaction with the emphasis on rote learning in their education and a desire to explore new directions for the future of TKM.

TKM can't just stick to traditional practices. It needs to move toward modernization. I've been inspired by role models who share this belief. (Student 2)

I used to think becoming a TKM doctor was a pretty straightforward path, but my professor showed me a whole new perspective on TKM using brain science. It made me feel like there are so many paths I can take within TKM. (Student 3)

In contrast to the role models, the participants also pointed to figures within the TKM field whose practices they found troubling. Those who appeared in the media and engaged in outdated or unscientific treatments for visibility were viewed critically.

Most of the TKM practitioners who appear on TV shows are criticized even within our community. They're ruining the image of TKM. (Student 5)

I think it's a problem when things that seem outdated or unscientific aspects of TKM are on TV shows. I don't think it's right to bring in non-scientific elements just because they make it more interesting. (Student 16)

Student 12 expressed reluctance to become a professor who resisted new ideas. In his view, clinging to outdated knowledge not only constrained the evolution of TKM, but also hindered the development of the next generation of practitioners.

While seeing how that TKM professor behaved, I made a promise to myself not to become someone like him. If I trap myself in such conservative views about TKM, I'll just end up as an old colleague who only gets criticized. (Student 12)

Anxiety: a closed and individualistic school culture without interaction

The participants described College of Korean Medicine's culture as being closed and individualistic. They noted that opportunities for interdisciplinary interaction were limited and that the program was largely organized around preparing for the national licensing exam. The curriculum followed a predetermined schedule with little flexibility, and the students remained in the same cohort throughout the six-year course of study.

We're basically always together, seeing the same people and having the same conversations every day. So, it's natural for a somewhat closed atmosphere to develop. (Student 12)

The participants noted the absence of peer relationships within the Korean medicine college environment. The individualistic culture was described in terms of "solo play," reflecting a tendency to avoid both conflict and collaboration. The atmosphere resembled that of a "cram school" focused on licensing, rather than a community for cultivating interpersonal connections.

It's super individualistic. That's probably why it feels more like a cram school. You just pay, attend the class, and go home. (Student 19)
It's like a cram school where everything is sacrificed for one goal: "becoming a TKM doctor." It's a closed system with no open ending, just a TKM doctor at the end. (Student 14)

Some of the participants remarked that the lack of a sense of community felt unsurprising. This perception was tied to the belief that, after graduation, TKM doctors would ultimately find themselves competing with each other.

[Interviewer: I guess there's no sense of community.] It's kind of ironic to talk about community because once we become TKM doctors, we're all competing against each other, aren't we? (Student 11)
You could say it's a free atmosphere, even an open culture in a good way, but in some sense, it's like we don't really harm one another, but we don't offer help either. (Student 1)
It's real. Every TKM student you teach could become your future competitor. You may help them as a senior, but they might open a clinic next door and

take your patients. As TKM doctors, we have to teach, but we're also in competition. (Student 14)

Conflict or reproduction: interactions with negative perceptions of TKM Doctors in online communities

External interactions that occur in online communities play a substantial role in shaping the PIF of TKM students. The participants expressed anger and frustration in response to the anonymous online discourse denigrating TKM.

I used to get really angry about all the baseless criticism of TKM on the Internet. (Student 4)
It's really tough to see those criticisms online after studying and working hard for six years—memorizing, learning, and taking countless exams. We're not doing all of this just to hear things like that. (Student 11)

As Student 12 explained, the early stages of university are a time when students are especially sensitive to how their group is perceived by society. Accordingly, TKM students responded strongly to the negative portrayals of TKM doctors that they encountered online.

You can't really avoid the Internet. When you first enter school, it's the time when you're most sensitive to how your group is seen. You look up stuff online, and there's so much negativity. If you see too much of that, it really messes with your mindset. Plus, in the beginning, some things in TKM feel strange or even absurd, so when all that piles up, it can hit really hard. (Student 12)

Peers also influenced them through informal conversations during their daily school lives. Student 16 noted that even those without firmly held views could absorb and reproduce others' opinions about TKM through repeated exposure to casual peer dialogue.

I think approximately half of the students are like me, I mean, not really for or against TKM. But the other half actively follows the news or whatever comes up. And when they talk about it, even students who didn't care much start to get influenced. If someone keeps bringing up negative stuff, those who hear it all the time may end up thinking negatively, too. (Student 16)

Some of the participants described the underlying tensions within TKM as being rooted in the perception of TKM as being in opposition to conventional medicine. They noted that, while Western medicine is considered

mainstream, TKM is often regarded as non-mainstream, which undermines their sense of self-worth.

The negative views of TKM online and its non-mainstream status have lowered our self-esteem. [Interviewer: Why do TKM students bring up Western medicine in the interviews?] The mainstream doesn't have to acknowledge the non-mainstream, but the non-mainstream has to (acknowledge the mainstream). (Student 2)

TKM is seen as non-mainstream. Even our professors know it. It appears that Western medicine continues to hold a dominant position in the healthcare landscape. (Student 11)

These perceptions, combined with negative portrayals online and the perceived divide among medical professions, contributed to feelings of anxiety and internalized doubt among TKM students. Some felt complicit about reproducing their negative TKM perceptions.

I believe that being a TKM doctor is a fantastic job. But it's just a shame that it seems to be undervalued, especially by the TKM students. (Student 20)

There are anti-TKM students who have a tendency to talk negatively about themselves. (Student 3)

TKM doesn't give you clear answers like Western medicine does. So, when you're already struggling and then see people online trashing it, it really hits you. Some students even start talking down about TKM themselves, almost like they're anti-TKM. (Student 15)

The participants who encountered negative online discourse about TKM responded either by resisting or reproducing it. In the absence of broader social interactions, many relied on online communities, which often led to confusion and anxiety regarding their future careers. To cope with this, they emphasized the value of authentic experiences such as practicums, visits to TKM clinics, and volunteer work, which they regarded as essential for developing confidence in themselves as future TKM doctors.

TKM students lacking confidence in their field can easily be influenced by others' opinions. (Student 14)
Some students never even went to a TKM clinic before graduating. While studying, we often heard people from Western medicine say that acupuncture or herbal medicine is just a placebo, and that kind of doubt really sticks. But once you experience it for yourself, like getting treated, seeing it work during practicum, or helping and healing someone through

volunteering, that's what gives you real confidence to be a TKM doctor. (Student 20)

Graduation: immediate or delayed career decisions

When they first entered school, many saw TKM as a safe option. However, as they moved further into the program, they started asking questions about their strengths, fitness for the work, and the qualities demanded by the profession. What had begun with vague expectations gradually settled into a sense of professional responsibility.

In my first year, I could excuse myself as "just a student," but now in my fourth year, I feel the weight of becoming a real TKM doctor. During volunteer work, patients didn't expect much from me. But I don't think it would be the same if they were paying. (Student 19)

I've learned to recognize my limits. When cases fall outside my expertise, I know it's best to refer them out promptly. (Student 3)

As graduation approached, they began to value personal aptitude more than academic grades.

TKM requires a strong aptitude. If you're overly logical, it might not suit you. (Student 1)

If you're only focused on grades without really understanding TKM, I wouldn't recommend applying. (Student 11)

The TKM students varied in their postgraduate plans. Some were actively prepared for clinical practice early on, showing initiative and seeking learning opportunities beyond the formal curriculum.

From the beginning, I came here with the goal of opening my own clinic. Visiting various TKM clinics helped reduce my fears and gave me a clear view of how to practice. (Student 14)

Student 15, who felt unprepared, chose to apply for an internship program to gain more clinical experience.

Do I, someone like me, have the right to see patients and even get paid for it? It doesn't make sense. I feel like I still have a lot to learn. That's why I'm thinking about applying to an internship program. (Student 15)

Some of the participants put off career decisions, as they had done in high school. They decided to spend a few years reflecting on their future during their public health

service. Passing the licensing exam felt more urgent than deciding on a future career path.

In high school, I just focused on the entrance exam. Even now, my priority is passing the licensing exam, not making future plans. If nothing changes, I'll likely go into public health service. (Student 16)
I've never really thought seriously about my future. I plan to enter public health service and use that time to think it through. For now, passing the licensing exam comes first. (Student 12)

Those considering not only becoming a TKM doctor, but also pursuing non-TKM career paths expressed concerns about the intense competition within the limited TKM job market.

Just because I have a license doesn't mean I have to become a TKM doctor. Actually, there's a TKM doctor who runs an online platform, and another who writes web novels. They told me that there are too many TKM doctors already, and the competition is really intense. (Student 2)

Discussion

Transformative learning theory has been widely applied in health education but continues to face criticism for its cognitive emphasis and insufficient attention to emotional and sociocultural dimensions [42, 43]. Building on Illeris's transformative learning model with three learning dimensions, this study extends this theory by refining the interaction dimension through constructivist grounded theory. In doing so, the interaction dimension is reconceptualized as consisting of two interrelated components: internal and external interactions. PIF emerges not from internal interactions alone, which in this context is often represented by formal education, but through the resonance between internal and external interactions. This demonstrates that identity changes occur when learners' meaning-making processes are dynamically engaged in broader external contexts. This refined interpretation advances Illeris's framework by illuminating how identity change unfolds at the intersection of the internal and external interaction dimensions of learning.

To clarify how the two forms of interaction are distinguished, this study defines internal interaction as learning experiences that occur within the formal and institutionally structured environment of TKM education. This includes coursework, examinations, and a closed and individualistic school culture that shapes students' daily academic lives. In contrast, external interactions refer to experiences that arise outside of these institutional structures, such as engagement with practicing TKM doctors beyond the required training, volunteer activities, and

encounters with social perceptions in online communities. What differentiates external interaction is not simply its occurrence outside the school setting but the fact that students perceive these experiences as originating from social contexts and as qualitatively different from formal learning.

While traditional developmental theories have often posited a linear and sequential trajectory of growth [44], this study revealed that TKM students' professional identities develop in nonlinear, iterative ways. Using Illeris's holistic model as an interpretive lens allowed shifts in identity to emerge inductively from students' lived experiences, rather than from predetermined developmental stages. Despite following the same curriculum, the participants constructed distinct professional identities by selectively interpreting meaningful learning experiences [45] and integrating them into personal narratives that supported their professional identities [46]. This narrative-based process illustrates how PIF is shaped by ongoing meaning-making about what the students value, extending beyond formal tasks embedded in the school curriculum. This is shaped by unexpected learning experiences that students encounter as they enter college, progress through their studies, and eventually graduate.

Internal interactions were predominantly grounded in formal educational settings such as schools, coursework, examinations, and the closed structure of TKM colleges. The students initially experienced resistance as they were confronted with a TKM curriculum that was unfamiliar to them, which included East Asian philosophy, classical texts, and Chinese characters.

Their attempts to overcome difficulties in formal education were associated with "informal learning" [47]. Authentic learning contexts, in which theoretical knowledge is integrated with practical experience through patient interaction, enable students to develop a deeper understanding of professional roles [48]. For some of the participants, anxiety about treating the patients was a motivating factor. They developed a sense of responsibility as medical professionals through their interactions with patients [48, 49]. These experiences helped to reorganize the incentive dimension of learning by restoring motivation, fostering confidence, and helping them understand TKM.

A distinctive contribution of this study is the identification of external interactions as powerful, but overlooked, forces in PIF. Encounters with practicing TKM doctors who challenged traditional norms provided the students with alternative professional identity models. At the same time, internal interactions in the school environment were shaped by a closed, individualistic culture. As the program structure was oriented toward the single career goal of becoming a TKM doctor, the students came to view one another primarily as potential future

competitors rather than as collaborators. This perception reinforced an individualistic culture and, along with the physically and socially isolated position of TKM within the university that is commonly noted in health professional education [2, 6]. This pattern partially contrasts with previous research suggesting that the learning environment shapes students' career decisions [50]. In this case, students' predetermined career trajectories shaped how they perceived and engaged with their learning environments. The culture within College of Korean Medicine narrowed students' access to the world outside and functioned as a factor that pushed them to rely increasingly on online communities as one of the few available spaces for external interaction.

One of the most distinctive findings of this study was the influence of external interactions through online communities. Some TKM students confronted online criticism that denigrated their professional group, prompting them to construct a "social identity" as members of a profession [51]. They perceived external criticism as a threat to their community [51, 52] and responded by reinforcing a shared sense of "we," thereby seeking to protect their professional identity [53–55]. Notably, social identity did not emerge within the school setting but through interaction with external online communities.

In contrast, some of the participants internalized these negative portrayals and reproduced them in conversations with their peers. This was intensified by the closed and individualistic culture within the school, which limited opportunities for meaningful social interaction in the curriculum. In the absence of such opportunities, the students turned to online spaces for cues regarding societal expectations and perceptions of TKM doctors.

Consequently, the findings indicate that internal and external interactions operate independently and shape different aspects of PIF. Professional identity emerges when these two forms of interaction resonate. This dynamic convergence extends the existing PIF and transformative learning literature, which typically emphasizes formal educational experiences as the primary drivers of identity formation.

Career decision-making represents the point at which students' professional identities become visible. Those with clearly defined goals actively sought interactions that aligned with their intended professional roles, such as engaging with clinicians and exploring the entrepreneurial aspects of TKM clinics. This demonstrated that PIF is not a passive developmental outcome but a proactive process [56]. As active agents of learning, the participants articulated their unique learning paths through personal identity narratives, showing how they combined internal and external experiences into coherent life stories as future TKM doctors [57].

In contrast, some male students who planned to fulfil their mandatory military service requirement as public health doctors postponed making career decisions, perceiving the public health service as an extension of their internal world rather than a true entry into society. The timing of students' expectations regarding crossing the boundary between school and society shaped their interpretations of internal and external interactions. Their interpretations of the boundaries between school and society were ultimately reflected in their career choices.

Overall, the professional identities observed in this study reflect a modern conception of identity characterized by instability, continual change, and dynamic processes of construction and reconstruction [44]. The students' professional identity did not emerge from prescribed tasks or linear progression but from the selective interpretation of experiences across entry, enrollment, and graduation. Such nonlinear and holistic changes underscore the need to move beyond reductionist analyses of PIF and adopt a perspective on transformative learning that is sensitive to context, narrative, and agency. The center of this process was learning. The students' professional identities shifted through the internal and external learning experiences that surrounded them.

This study contributes to fostering a more nuanced understanding of transformative learning by demonstrating that professional identity emerges through resonance between internal and external interactions. Moreover, it introduces a narrative-based account of identity formation that highlights how individual meaning-making and interpretation become visible through personal choices. These insights offer a theoretical expansion of Illeris's framework and the PIF theory, emphasizing that professional identity is not solely the product of formal training but is co-constructed through learners' lived learning experiences within and beyond institutional boundaries.

Conclusion

This study examines how TKM students form professional identities through their learning experiences. Drawing on their narratives, the findings suggest that PIF is shaped by internal and external interactions as interpreted through learners' own meaning-making efforts. This study sheds light on how identity is constructed within pluralistic medical education, in which multiple medical paradigms, diverse learning experiences, and cultural norms intersect.

Our findings have three key implications. First, PIF can be understood as a "narrative-based identity" [46] constructed through students' selective interpretation of fragmented experiences, which cannot be sufficiently explained by linear development models. By adopting the framework of transformative learning [22], this study provides an in-depth account of how professional

identity is formed through personal meaning-making and interpretation of various learning experiences. Second, the distinction between internal and external interactions offers a useful framework for explaining variations in how students construct meaning from the same activities. For example, one student viewed volunteer work as internal, distinguishing the patients they encountered from the real patients they would be expected to treat as a licensed practitioner, whereas another perceived it as an external and beneficial experience connecting them with society. These interpretations illustrate how learning interactions are shaped less by physical location than by how learners construct meaning through narratives. Third, learning environments that support PIF actively must be developed. Opportunities such as volunteer work, mentoring, and engagement with TKM practitioners as role models can encourage students to reflect critically on their profession, explore career paths, and form professional identities.

This study has several limitations. Participation was limited to TKM students, and the focus on fourth-year students captured their PIF only during their transition to professional life. Future research should examine other disciplines and follow graduates in practice to explore their PIF more deeply.

Abbreviations

PIF	Professional Identity Formation
TKM	Traditional Korean Medicine

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12909-025-08543-3>.

Supplementary Material 1.

Authors' contributions

Conceptualization, G.M.P and A.J.H.; methodology, G.M.P; validation, G.M.P and A.J.H.; formal analysis, G.M.P and A.J.H.; resources, A.J.H.; writing—original draft preparation, G.M.P; writing—review and editing, A.J.H.; supervision, A.J.H.; project administration, A.J.H.; funding acquisition, A.J.H.

Funding

This study was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (grant number NRF-2020S1A3A2A02091529).

Data availability

The raw data generated and/or analyzed are available from the authors without undue reservation.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the ethical standards of the Declaration of Helsinki and approved by the Chung-Ang University Ethics Committee (Ref. 1041078-202008-HRSB-233-01). All participants provided written confirmation of informed consent before proceeding with the study. The anonymity of research participants was protected by masking their names with numerical codes.

Consent for publication

The study's participants consented to having their interview responses published.

Competing interests

The authors declare no competing interests.

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Received: 11 August 2025 / Accepted: 29 December 2025

Published online: 05 January 2026

References

1. Cruess RL, Cruess SR, Boudreau JD, Snell L, Steinert Y. A schematic representation of the professional identity formation and socialization of medical students and residents. *Acad Med*. 2015;90(6):718–25.
2. Weaver R, Peters K, Koch J, Wilson I. Part of the team': professional identity and social exclusivity in medical students. *Med Educ*. 2011;45(12):1220–9.
3. Goldie J. The formation of professional identity in medical students: considerations for educators. *Med Teach*. 2012;34(9):641–8.
4. Cruess RL, Cruess SR, Boudreau JD, Snell L, Steinert Y. Reframing medical education to support professional identity formation. *Acad Med*. 2014;89(11):1446–51.
5. Baldwin A, Mills J, Birks M, Budden L. Reconciling professional identity: A grounded theory of nurse academics' role modelling for undergraduate students. *Nurse Educ Today*. 2017;59:1–5.
6. Park GM, Hong AJ. Not yet a doctor: medical student learning experiences and development of professional identity. *BMC Med Educ*. 2022;22(1):1–12.
7. Egan T, Jaye C. Communities of clinical practice: the social organization of clinical learning. *Health*. 2009;13(1):107–25.
8. Littlewood S, Ypinazar V, Margolis SA, Scherpbier A, Spencer J, Dornan T. Early practical experience and the social responsiveness of clinical education: systematic review. *BMJ*. 2005;331(7513):387–91.
9. Miles S. Addressing shame: what role does shame play in the formation of a modern medical professional identity? *BJPsych Bull*. 2020;44(1):1–5.
10. Lim CY, Han HJ, Hong JS, Kang YS. Competency modeling for doctor of Korean medicine & application plans. *J Korean Med*. 2016;37(1):101–13.
11. Hong JS, Kang YS. The implications of the case of medical education in North America on Korean medicine education. *J Korean Med Hist*. 2018;31(2):91–101.
12. Leem KH, Park HK. Traditional Korean medicine: now and the future. *Neurol Res*. 2007;29:3–4.
13. An HJ, Shin HT. The phenomenological study on the experience of the stop-out of Korean medicine students. *J Soc Prev Korean Med*. 2016;20(2):39–51.
14. Lee HJ. The comparative study on professionalism of East Asian traditional medical groups. *Soc Theory*. 2012;20:341–65.
15. Kwon OH, Lee JH. A basic study on the relationship between academic achievement, lifestyle, and the psychological characteristics of Korean medical students. *J Orient Neuropsychiatry*. 2019;30(4):319–26.
16. Kim JY, Lee JH. A study on the perception and attitude of Korean medical students toward career choice as a Korean medicine Doctor. *J Soc Prev Korean Med*. 2015;19(1):1–10.
17. Kwon SS, Shin SS, Lim BM. A survey of students' satisfaction with education in traditional Korean medicine. *J Korean Med*. 2012;33(1):1–11.
18. Kim BS. Concept of talent on the Doctor of Korean medicine to pursue university education in vocational performed for Korean medical Doctor. *J Physiol Pathol Korean Med*. 2015;29(3):256–66.
19. Sim SB, Kweon JH, Kim HW, Hong JW, Shin SW. Student satisfaction study of clinical skills training in Korean medical education. *J Korean Med*. 2013;34(3):37–53.
20. Mezirow J. An overview on transformative learning. In: Crowther J, Sutherland P, editors. *Lifelong learning: concepts and contexts*. New York, NY: Routledge; 2006. pp. 90–105.
21. Illeris K. How we learn: learning and non-learning in school and beyond. New York, NY: Routledge; 2007.
22. Illeris K. Transformative learning and identity. New York, NY: Routledge; 2014.

23. Kim TW, Han CH. Medicine within society, society within medicine: an anthropological exploration of Korean medicine in South Korea and traditional Chinese medicine in China. *J Intern Korean Med*. 2012;33(2):111–25.
24. Ahn JH, Chae WJ, Cho SK, Cho CS. The study on senior citizens and Korean medicine university students' satisfaction about medical service and senior citizens' perception of medical welfare service. *J Haehwa Med*. 2015;24(1):1–14.
25. Jin S, Park S. Career-related characteristics of premedical students in Korean medicine college. *J Soc Prev Korean Med*. 2013;17(3):47–61.
26. Creswell JW. *Qualitative inquiry and research design: choosing among five approaches*. 3rd ed. Los Angeles, CA: SAGE; 2013.
27. Charmaz K. *Constructing grounded theory: A practical guide through qualitative analysis*. London, UK: SAGE; 2006.
28. Charmaz K, Thornberg R. The pursuit of quality in grounded theory. *Qual Res Psychol*. 2021;18(3):305–27.
29. Creswell JW. *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. 4th ed. Boston, MA: Pearson Education; 2012.
30. Erikson EH. *Identity. Youth and crisis*. New York, NY: W. W. Norton & Company; 1968.
31. Super DE. A life-span, life-space approach to career development. *J Vocat Behav*. 1980;16(3):282–98.
32. Jo HJ. Exploring the conditions that will allow for change in traditional Korean medicine Curricula - Focusing on the integrated curriculum. *J Korean Med Classics*. 2020;33(3):63–89.
33. Lee JW, Kim GC. The effect of work values of Korean medicine college students on major commitment and major satisfaction. *J Soc Prev Korean Med*. 2020;24(1):49–56.
34. Lee JW, Kim GC. Effect of work values on major commitment and major satisfaction among Korean medicine college students. *Health Soc Welf Rev*. 2005;25(2):107–46.
35. Kim SY, Erm TM, Park SB, Hong JP, Han OS, Yoo HI, Education. Clinical Practice, and research on psychiatric illnesses in Korean traditional medicine. *J Korean Neuropsychiatr Assoc*. 2007;46(2):151–58.
36. IKMEE (Institute of Korean Medicine Education and Evaluation). Job duties and competencies of TKM doctors. 2016 [cited 2020 Jul 22]. Available from: <https://www.ikmee.or.kr/03/03.php>
37. Carmichael T, Cunningham N. Theoretical data collection and data analysis with gerunds in a constructivist grounded theory study. *Electron J Bus Res Methods*. 2017;15(2):59–73.
38. Maz J. Employing a grounded theory approach: core characteristics. *Br J Card Nurs*. 2013;8(9):453–8.
39. Thomson SB. Sample size and grounded theory. *JOAAG*. 2011;5(1):45–52.
40. Francis JJ, Johnston M, Robertson C, Glidewell L, Entwistle V, Eccles MP, Grimshaw JM. What is an adequate sample size? Operationalising data saturation for theory-based interview studies. *Psychol Health*. 2010;25:1229–45.
41. Lincoln Y, Guba E. *Naturalistic inquiry*. Beverly Hills (CA): Sage; 1985.
42. Grund J, Singer-Brodowski M, Buessing AG. Emotions and transformative learning for sustainability: a systematic review. *Sustain Sci*. 2024;19(1):307–24.
43. McClain AL. New developments in transformative learning. *New Dir Adult Contin Educ*. 2024;2024(184):20–9.
44. Rodgers CR, Scott K. The development of the personal self and professional identity in learning to teach. In: Cochran-Smith M, Feiman-Nemser S, McIntyre DJ, Demers KE, editors. *Handbook of research on teacher education: enduring questions in changing contexts*. New York, NY: Routledge; 2008. pp. 732–55.
45. Savickas ML. Life design: A paradigm for career intervention in the 21st century. *J Couns Dev*. 2012;90(1):13–9.
46. Ibarra H, Barbulescu R. Identity as narrative: Prevalence, effectiveness, and consequences of narrative identity work in macro work role transitions. *Acad Manage Rev*. 2010;35(1):135–54.
47. Livingstone D. *Adults' informal learning: Definitions, findings, gaps, and future research*. Toronto, Canada: NALL; 2001. (NALL working paper No. 21).
48. Helmich E, Bolhuis S, Dornan T, Laan R, Koopmans R. Entering medical practice for the very first time: emotional talk, meaning and identity development. *Med Educ*. 2012;46(11):1074–86.
49. Prince K, Van de Wiel M, Scherpier A, van der Vleuten C, Boshuizen H. A qualitative analysis of the transition from theory to practice in undergraduate training in a PBL-medical school. *Adv Health Sci Educ Theory Pract*. 2000;5(2):105–16.
50. Kuijpers M, Meijers F, Gundy C. The relationship between learning environment and career competencies of students in vocational education. *J Vocat Behav*. 2011;78(1):21–30.
51. Stets JE, Burke PJ. Identity theory and social identity theory. *Soc Psychol Q*. 2000;63(3):224–37.
52. Tajfel H. *Human groups and social categories: studies in social psychology*. New York, NY: Cambridge University Press; 1981.
53. Owens TJ, Robinson DT, Smith-Lovin L. Three faces of identity. *Annu Rev Sociol*. 2010;36:477–99.
54. Polletta F, Jasper JM. Collective identity and social movements. *Annu Rev Sociol*. 2001;27:283–305.
55. Hornsey MJ. Social identity theory and self-categorization theory: A historical review. *Soc Personal Psychol Compass*. 2008;2(1):204–22.
56. Siebert DC, Siebert CF. Help seeking among helping professionals: A role identity perspective. *Am J Orthopsychiatry*. 2007;77(1):49–55.
57. Savickas ML. Career construction theory and practice. In: Lent R, Brown SD, editors. *Career development and counseling: putting theory and research to work*. Hoboken, NJ: Wiley; 2013. pp. 42–70.

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