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Pharmacy from the perspectives of other health professions: An intervention to foster professional identity among freshmen pharmacy students

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ABSTRACT

Background: Professional identity is crucial for the development of pharmacy students' professional confidence, learning motivation and future career choices. However, how to develop students' professional identity in pharmacy education is an underdeveloped field of research. The critical component of professional identity has been considered formed as a result of stepwise socialization. Therefore, pharmacy professional identity might be influenced by associations with other health care professionals, such as physicians and nurses, who are involved in health care collaboration with pharmacists.

Objectives: This work aimed to investigate the effect of a student-led interview intervention called "Pharmacy from the perspectives of other health professions" as an intervention on pharmacy freshmen's perceptions and positivity toward the pharmacy profession.

Methods: In this prospective pre/postintervention study, the effect of the interview intervention on students' job preferences as well as attitudes toward the pharmacy profession and pharmacists' role in health care was evaluated among 70 first-year pharmacy undergraduates equally divided into intervention and control groups using a self-developed questionnaire.

Results: Compared with the controls, the numbers of respondents reporting *no specific reasons* for selecting the pharmacy profession and stating that they were *unclear* about their preferred post-graduation work sector were significantly reduced after the intervention. Participating in the intervention increased the number of students who agreed or strongly agreed that they would have a fulfilling and socially respectable career. Significantly more students in the intervention group agreed with the pharmacists' role in health care as well as the current situation of pharmacy human resources than in the control group.

Conclusion: This student-led interview intervention could be applied as an effective tool for improving students' professional identity and positivity in pharmacy education.

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1. Introduction

To meet the workforce needs of the rapidly developing pharmaceutical industry and to improve delivery of modern pharmacy services, pharmacy education aiming to prepare high-quality pharmacy professionals is being promoted ceaselessly and vigor-

ously worldwide (Alrasheedy et al., 2022; Bates et al., 2018; Hatahet et al., 2022). Accordingly, the market for pharmacy schools is expanding, and the enrollment of pharmacy students is increasing. In China, which has the second largest pharmaceutical market globally (Chen, 2018), pharmacy human resources are at a critically low state (Liu et al., 2021; Zhang et al., 2020). In particular, pharmacy professionals with high education levels are in short supply. Currently, less than one-third of Chinese pharmacists have bachelor's degrees or above (Liu et al., 2021), and most have a junior college level education (Lan et al., 2020). Such manpower problems limit the development of the pharmaceutical industry and pharmacy care in China. In the last several decades, pharmacy undergraduate education in China has been strengthened to develop a high-level pharmaceutical workforce. The majority of Chinese pharmacy schools provide a Bachelor of Science degree for

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undergraduate students following completion of a 4-year pharmacy program. In developed countries, the pharmacy profession has transitioned from an industry-oriented profession to a patient-oriented profession (Alameddine et al.,2020). However, because of the late introduction of clinical pharmacists' role in health care in China, Chinese pharmacy graduates are distributed across a variety of pharmacy-related fields, including in hospitals or communities as clinical pharmacists; pharmaceutical companies in marketing, sales, research, development or policy positions; academic institutions; and the government (Zhang et al.,2020).

Perhaps due to poor public perception of the potential scopes of practice/services of pharmacy professionals (Penm et al.,2017), the pharmacy profession is not a popular profession among the majors offered by the universities in China. Moreover, in the context that the pharmacy profession has recently been in a state of transformation, concerns regarding professional identity and the future of the profession are bothering not only pharmacy students but also in-service pharmacy professionals (Kellar et al.,2022; Traulsen and Druedahl, 2018; Siracuse et al.,2008; Gregory and Austin,2019; Noble et al.,2019). Especially for pharmacy students, the uncertain, fragmented and evolving nature of the pharmacy professional's identity greatly challenges the students' professional confidences, learning motivation and future career choices (Kellar et al.,2022; Noble et al.,2019; Quinn et al.,2020; Neubert et al.,2020). As an important component of practice change, professional identity has attracted special attention in the field of pharmacy education as a foundation for curriculum reform and professional development (Kellar and Austin,2022; Kella et al., 2020; Ford et al.,2020). To date, how to develop students' professional identity in pharmacy education is an underdeveloped field of research (Kellar and Austin,2022; Noble et al.,2019; Mylrea et al.,2019).

Notably, as a kind of social identity, professional identity has been proposed to be promoted by encouraging individuals to perceive differences between members of their social group and those of outgroups (Neubert et al.,2020). The critical component of professional identity is formed as a result of stepwise socialization, based on the fact that others' expectations affect an individual's perception regarding his or her own role within society (Ford et al.,2020). The interactions that pharmacy students/professionals have with other individuals outside the profession have been believed to have the potential to affect their professional identity formation (Neubert et al.,2020). Neubert et al. (2020) proposed the concept of relational professional identity to help educators establish clearer expectations regarding pharmacy students' relationships with physicians and patients. Importantly, in the modern patient-centered health care model, interprofessional collaboration among pharmacists, physicians and nurses, etc., has been considered the cornerstone for the effective delivery of optimal patient care (Wang et al., 2020). It can be speculated that the professional identity in these health professions might be influenced by associations with others.

In the present study, we designed a student-led interview intervention called "Pharmacy from the perspectives of other health professions" to encourage pharmacy freshmen to acquire the impression of their own profession (pharmacy) from other health professionals, such as physicians and nurses, and investigated the effect of this intervention on professional identity among student participants.

2. Methods and materials

2.1. Study description

The study employed a prospective pre/postintervention design. All first-year pharmacy undergraduates (70 students) from 2

classes enrolled in 4-year pharmacy degree programs at Wuhan University of Science and Technology, China, in the autumn semester of 2020 were invited to participate in this study. By extending the idea of relational professional identity (Neubert et al.,2020) to include the interprofessional relationships among health professions, faculty designed and organized a student-led interview activity as an intervention, aiming to use the stereotyped ideas of other health professionals to describe the pharmacy profession. This intervention was introduced into University Freshman Education. A total of 70 pharmacy freshmen in two classes were predetermined to be a control group (n = 35, Class 1) and an intervention group (n = 35, Class 2).

One week after enrollment in the university, all the involved students were notified about the objective and steps of the intervention activity. The interview activity and the pre/post test were voluntary for students and were not graded as part of any course. After informed consent was obtained, students were invited to complete a 32-statement baseline survey designed to measure their perceptions and positivity toward the pharmacy profession before a 3-month interview intervention. At the end of the autumn semester, 2020, all the students in the control group and the intervention group were required to complete the same questionnaire as a postintervention survey. The students' sociodemographic characteristics, including gender, age, and urban or rural origin, were collected from the Student Record System at the university. Each student respondent was assigned an ID number to ensure the consistency of the pre- and postintervention data. The study aimed to assess the change in pharmacy freshmen's professional identity after participation in the intervention event.

2.2. Intervention

Step 1: An initial meeting

First, the faculty committee convened an initial meeting among students in the intervention group (Class 2), organized the participants into several teams of 4–6 students each, and launched the interview intervention. The students in the intervention group were required to prepare interviews with at least 3 interviewees from health professions other than pharmacy, among which professionals such as physicians and nurses were strongly recommended. The interview topic was "From your professional perspective, what and how about the pharmacy profession?" Any face-to-face, telephone or online interview was allowed.

Step 2: Interview planning

Within two weeks after the initial meeting, the team leaders were required to organize team discussions to arrange the interview activity. The team members worked together to brainstorm interview questions, select the interviewee candidates, decided on key subtopics and themes for the interview, reached a consensus on the interview outline, and assigned tasks to each one. The team's interview plan was developed and finalized based on the team discussion and then approved by the faculty committee. An example of the approved interview plans is shown in the [supplementary material](#).

Step 3: Interviews

Students were given 2 months to complete all parts of the interview activity according to the team's interview plan. Students were required to confirm that the interviewees were voluntarily willing to take part in the interview related to personal experiences and opinions. The interviews were recorded video and audio after obtaining the interviewees' consent.

Step 4: Team reflection and presentation preparation

Within two weeks after completion of the team's interview activity, students were required to engage in team reflection. The team members carried out a reflection discussion based on their experience of the interviews and what they learned from the

communication with the interviewee. Then, each team prepared a 10-min oral presentation covering the main opinions of interviewees toward the pharmacy profession, as well as the team members' reflections and analysis on the advantages and disadvantages of the pharmacy profession based on the interviewees' opinions.

Step 5: Class discussion

At the end of the intervention, the faculty held a formal meeting in which each team was required to deliver the oral presentation to the other teams in the classroom. Then, the faculty committee encouraged students to make comments on the interviews conducted by the other teams and led a discussion about students' own feelings about the pharmacy profession. To conclude the intervention, the faculty committee provided feedback for students based on their presentations and class discussion.

2.3. Measurement tool content

The initial draft of the questionnaire used in this study included 32 question items grouped into 3 sections. The first section consisted of 2 questions on the main factor influencing the respondents' decision to undertake a pharmacy degree (Q1) and their job preferences (Q2). In the second section, the 10 items using a 5-point Likert scale (from 1 = strongly agree to 5 = strongly disagree) gathered data on students' attitudes and opinions toward the pharmacy profession (Q3-6) and the importance of pharmacists' role in health care (Q7-12). The third section included elements designed to measure the students' understanding of the pharmacy profession. Q13 was designed to be answered on a 5-point Likert scale, from "know nothing" (score of 1) to "know everything/expert" (score of 5), for a self-evaluation of understanding. Then, students were asked 5 questions about general pharmacy knowledge to objectively assess the respondents' actual pharmacy knowledge levels. A knowledge score of 0 was received for each incorrectly answered question and 1 for correctly answered questions. The minimum objectively assessed knowledge score was 0, and the maximum was 5.

2.4. Measurement tool validity

Two educators with experience in pharmacy education were asked to appraise the content validity, clarity, relevance, and conciseness of the questionnaire. The revised questionnaire was pre-tested in a convenience sample of 20 s-year pharmacy students who were not included in the formal study. After a minor modification in the wording based on feedback from 2 educators and 20 pretest respondents, the survey questionnaire was finalized. The questionnaire was originally developed in English by research members and then translated into Chinese and back into English after modification in response to the pilot study. The final bilingual questionnaire in English and Chinese was administered to student participants to ensure the accuracy of the questionnaire data. The Kaiser–Meyer–Olkin (KMO) measure and Cronbach's α value of the formal questionnaire were 0.796 and 0.745, respectively.

2.5. Data analysis

Data from pre- and postintervention questionnaires were coded and entered into SPSS24.0 for analysis. The results for quantitative variables are presented as the mean \pm standard deviation (SD), and numbers (%) are presented for categorical variables. χ^2 and Fisher's exact tests were employed to compare categorical data. The differences between the quantitative results of the intervention and control groups were examined with the repeated-measures analyses of variance (ANOVA) using intervention (yes or no) as the between-subject factor and pre- and postintervention data as

the within-subject factor. $P < 0.05$ or $P < 0.01$ were considered statistically significant.

2.6. Ethical considerations

The study protocol was approved by the Ethics Committee of Medicine College, Wuhan University of Science and Technology (No. 202101533). Electronic informed consent, which contained the purpose of the study and a statement about voluntary participation, was provided to and approved by all student participants.

3. Results

All first-year pharmacy undergraduates ($n = 70$) in the university voluntarily participated in this study and completed the pre- and postintervention questionnaires; thus, a response rate of 100% was obtained. Demographic characteristics of the student participants are shown in Table 1. When the student respondents were asked about the most important factor influencing their decision to undertake a pharmacy degree, as shown in Table 2, compared with that of control students, the number of respondents reporting *no specific reasons* for selecting the pharmacy profession was significantly reduced after the intervention ($P < 0.05$). Despite the fact that the differences did not reach statistical significance because of the small sample size, it seemed that more students stated "Interest in health care", "Own interest in pharmacy", "Job prospects/opportunities", "Job security" or "Challenging" as their main reason to undertake a pharmacy degree after participating in this student-led interview intervention "Pharmacy from the perspectives of other health professions". Similarly, this intervention activity significantly decreased the number of students stating that they were *unclear* about the possible work sector upon graduation (Table 3; $P < 0.05$). After the intervention, all the respondents in the intervention group had decided on their future career intentions, among whom 49% would like to work in pharmaceutical manufacturing and 36% considered hospitals as their preferred sector.

The students' attitudes toward the pharmacy profession are summarized in Table 4. The results from the repeated-measures ANOVAs showed that, compared to the control group, students after the intervention displayed more positive attitudes toward statements Q3 and Q4. The increases in agreement from 49% to 74% (Q3) and 32% to 58% (Q4) of students in the intervention group were significant compared with those of the controls (Q3: 49% to 43%; Q4: 32% to 43%) ($P < 0.01$). That is, participating in the intervention increased the number of students who agreed or strongly agreed that they would have a fulfilling and socially respectable career. Regarding the importance of pharmacists' role in health care, as shown in Table 5, after the intervention, significantly more students in the intervention group disagreed with the statement "The most important job of pharmacists is to prepare, mix, and dispense medicines" (Q7), and agreed with the current situation of

Table 1
Demographic characteristics of the student participants in this study, No. (%).

Participant attribute	The control group (Class 1, n = 35)	The intervention group (Class 2, n = 35)
Gender		
Male	14(40)	15(43)
Female	21(60)	20(57)
Age		
>18	12(34)	7(20)
=18	19(54)	24(69)
<18	4(22)	4(22)
Region of origin		
Urban	26(74)	25(71)
Rural	9(26)	10(29)

Table 2
Main factors chosen by student respondents as influencing their decision to undertake a pharmacy degree before and after the intervention, No. (%).

Factors	The control group (n = 35)		The intervention group (n = 35)		P value
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	
Own interest in pharmacy	17(49)	13(37)	10(29)	15(43)	0.218
Family	0(0)	0(0)	1(3)	0(0)	NA
Teacher' advice	0(0)	0(0)	0(0)	0(0)	NA
Income/welfare	0(0)	0(0)	2(6)	2(6)	NA
Job prospects/ opportunities	1(3)	1(3)	0(0)	1(3)	0.386
Interest in healthcare	0(0)	3(9)	2(6)	8(23)	0.400
Friends	1(3)	1(3)	0(0)	0(0)	NA
Job security	0(0)	2(6)	1(3)	4(11)	0.495
Challenging	0(0)	0(0)	0(0)	1(3)	NA
No specific reasons	16(46)	15(43)	19(54)	4(11)	0.018

NA: Not applicable.

Table 3
Student respondents' preferred sectors in pharmacy-related field of work upon graduation, No. (%).

Preference	The control group (n = 35)		The intervention group (n = 35)		P value
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	
Hospitals	7(20)	5(14)	6(17)	9(26)	0.343
Drug stores	0(0)	1(3)	0(0)	0(0)	NA
Pharmaceutical manufacturing	18(51)	19(54)	11(31)	17(49)	0.452
Marketing and sales	0(0)	1(3)	2(6)	1(3)	0.248
Regulatory affairs and drug registration	0(0)	0(0)	0(0)	0(0)	NA
Academia	1(3)	2(6)	5(14)	4(11)	0.505
Government	0(0)	0(0)	1(3)	3(9)	NA
Educational institute	0(0)	0(0)	2(6)	0(0)	NA
Areas outside pharmacy	2(6)	2(6)	1(3)	1(3)	1.000
Unclear	7(20)	5(14)	7(20)	0(0)	0.047

Table 4
Student respondents' attitudes toward the pharmacy profession, No. (%).

Statement		The control group (n = 35)					The intervention group (n = 35)					P value
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
Q3: I believe I will have a fulfilling career in the area of pharmacy.	Pre-intervention	0(0)	17 (49)	17(49)	1(3)	0(0)	2(6)	15 (43)	18(51)	0(0)	0(0)	<0.001
	Post-intervention	2(6)	13 (37)	18(51)	1(3)	1(3)	6(17)	20 (57)	9(26)	0(0)	0(0)	
Q4: I believe I will have a socially respectable career in the area of pharmacy.	Pre-intervention	2(6)	9(26)	23(66)	1(3)	0(0)	3(9)	8(23)	24(69)	0(0)	0(0)	0.012
	Post-intervention	2(6)	13 (37)	19(54)	0(0)	1(3)	3(9)	17 (49)	15(43)	0(0)	0(0)	
Q5: I believe I will have a financially rewarding career in the area of pharmacy.	Pre-intervention	0(0)	7(20)	26(74)	2(6)	0(0)	2(6)	4(11)	27(77)	2(6)	0(0)	0.571
	Post-intervention	2(6)	8(23)	22(63)	2(6)	1(3)	0(0)	9(26)	24(69)	2(6)	0(0)	
Q6: I believe I will work under pressure and have a heavy workload in the area of pharmacy.	Pre-intervention	1(3)	4(11)	17(49)	13(37)	0(0)	0(0)	7(20)	15(43)	12(34)	1(3)	1.000
	Post-intervention	2(6)	11 (31)	19(54)	3(9)	0(0)	2(6)	15 (43)	11(31)	7(20)	0(0)	

pharmacy human resources in China (Q12) than the control group ($P < 0.01$).

Then, we measured the effect of the intervention on the respondents' understanding of the pharmacy profession. However, the enhancements of self-evaluated and actual knowledge scores in the intervention group at the end of the semester were not found to be more significant than those of control respondents (Table 6, $P > 0.05$).

4. Discussion

Despite the fact that the importance of professional identity in pharmacy education has been well accepted, effective measures and strategies to foster pharmacy students' beliefs and promote

their positivity for the pharmacy profession are still lacking (Kellar and Austin, 2022; Noble et al., 2019; Mylrea et al., 2019, 2017). The limited previous studies strongly proposed experiential learning through interaction with practicing pharmacy professionals such as pharmacists (Mylrea et al., 2017). This prospective pretest–posttest study first designed a student-led interview intervention, entitled “Pharmacy from the perspectives of other health professions”, that aimed to encourage students to actively and objectively review their own profession based on the perceptions and opinions of other health professions. After introducing this interview intervention into University Freshman Education, our study showed that, compared to the controls, the addition of this interview intervention component inspired students' positive thinking in terms of future career intentions and led to a

Table 5
Student respondents' attitudes and opinions toward the importance of pharmacists' role in health care, No. (%).

Statement		The control group (n = 35)					The intervention group (n = 35)					P value
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
Q7: The most important job of pharmacists is to prepare, mix, and dispense medicines.	Pre-intervention	2(6)	12 (34)	6(17)	14(40)	1(3)	2(6)	6(17)	14(40)	13(37)	0(0)	0.014
	Post-intervention	1(3)	10 (29)	3(9)	20(57)	1(3)	0(0)	3(9)	13(37)	11(31)	8(23)	
Q8: Pharmacists are more professional than physicians in identifying and resolving drug-related issues.	Pre-intervention	7(20)	17 (49)	6(17)	2(6)	3(9)	10(29)	18 (51)	7(20)	0(0)	0(0)	0.134
	Post-intervention	9(26)	16 (46)	7(20)	3(9)	0(0)	13(37)	15 (43)	7(20)	0(0)	0(0)	
Q9: Pharmacists assume great responsibility for guiding patients to use drugs rationally.	Pre-intervention	15(43)	17 (49)	3(9)	0(0)	0(0)	12(34)	22 (63)	1(3)	0(0)	0(0)	0.571
	Post-intervention	15(43)	18 (51)	2(6)	0(0)	0(0)	14(40)	20 (57)	1(3)	0(0)	0(0)	
Q10: Pharmacists participate in hospital ward rounds.	Pre-intervention	3(9)	9(26)	18 (51)	4(11)	1(3)	2(6)	7(20)	19(54)	7(20)	0(0)	0.160
	Post-intervention	4(11)	15 (43)	13(37)	3(9)	0(0)	4(11)	15 (43)	12(34)	4(11)	0(0)	
Q11: During the coronavirus disease 2019 (COVID-19) pandemic, the roles of pharmacy professionals in developing new drugs, ensuring rational drug use, etc. are critical to cope with the pandemic.	Pre-intervention	22(63)	12 (34)	1(3)	0(0)	0(0)	16(46)	19 (54)	0(0)	0(0)	0(0)	0.535
	Post-intervention	25(71)	10 (29)	0(0)	0(0)	0(0)	19(54)	15 (43)	1(3)	0(0)	0(0)	
Q12: In China, pharmacists are in short supply, and are faced with the problem of a low education level.	Pre-intervention	2(6)	15 (43)	17(49)	1(3)	0(0)	2(6)	16 (46)	15(43)	2(6)	0(0)	0.001
	Post-intervention	3(9)	24 (69)	7(20)	1(3)	0(0)	8(23)	24 (69)	3(9)	0(0)	0(0)	

Table 6
Effect of the interview intervention on the self-evaluated or objectively assessed understanding of the pharmacy profession (Mean \pm SD).

	The control group (n = 35)		The intervention group (n = 35)	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Self-evaluated knowledge score	2.68 \pm 0.77	3.41 \pm 0.78	2.57 \pm 0.70	3.37 \pm 0.69
Objectively assessed knowledge score	1.91 \pm 1.08	2.18 \pm 1.14	1.69 \pm 1.08	1.89 \pm 0.93

marked increase in students' positive attitudes toward the pharmacy profession and pharmacists' role in health care.

One of the key tasks in University Freshman Education in China is establishing a stable professional identity and emotions. Early-year pharmacy undergraduates undergo a transformation from laypersons to pharmacy professionals. As an integral part of professionalism, professional identity directly supports and shapes students' intrinsic motivations for their subsequent professional learning and is increasingly accepted as a goal of pharmacy education (Kellar and Austin, 2022; Kellar et al., 2020; Ford et al., 2020). Clarifying their own professional role and responsibility is essential for the health care professionals to engage in the collaborative clinical practice (Wang et al., 2020; Joynes, 2018). Essentially, professional identity is generally considered to form at least in part through professional socialization with peers (Neubert et al., 2020; Joynes, 2018; Shikama et al., 2021). Identity is shaped not only at the individual level but also at the collective level, where an individual is socialized into specific roles and relationships in the work setting (Mylrea et al., 2019). The interprofessional socialization in which different professions typically interact encourages professionals to appreciate and understand their own and other professions, thus driving identity development (Neubert et al., 2020; Joynes, 2018; Shikama et al., 2021). In medical education, previous studies (Shikama et al., 2021; Jarvis-Selinger et al., 2012) have proposed that observing how other health care profes-

sionals as well as nonhealthcare hospital staff interact with clinical doctors is important in creating and consolidating physician professional identity. Similarly, in this study, we found that socialization with other health care professionals via the student-led interview intervention provided the opportunity for first-year pharmacy students to immersively experience the impact of pharmacy professional values, promoted the student recognition of professional responsibility, and established their self-conceptualization as pharmacy professionals.

Numerous studies have shown that soci-demographic factors such as gender and urban or rural background influence the pharmacy students' perceptions of their professional role and their career intentions (Kellar et al., 2022; Liu et al., 2021; Zhang et al., 2020). In this controlled study, the distributions of gender and region of origin were similar between the control and intervention classes, suggesting the comparability of the two groups. On the baseline survey, a considerable proportion of pharmacy freshmen felt lost about their profession, which was manifested by half of respondents reporting *no specific reasons* influencing their decision to undertake a pharmacy degree and 20% stating that they were *unclear* about their preferred work sectors upon graduation. At the end of the semester when the student-led interview intervention took place, significantly fewer students still wondered about the reasons, and no student felt *unclear* about their future career choices in the intervention group, suggesting that this interview

intervention activity was beneficial for raising students' awareness of possible career pathways within pharmacy and consolidating their professional identity. Accordingly, after participating in the intervention, students responded more positively to the dedication of pharmacy professionals such as pharmacists and the demand for optimization of the Chinese pharmacy workforce, developed more positive attitudes toward professional prospect, and showed more appreciation for pharmacists' role in health care. However, we did not find that the enhancement of student positivity for the pharmacy profession by the intervention was associated with respondents' self-evaluated and actual knowledge of the profession. The possible reason is that during the semester when the student-led interview intervention took place, all the involved students were already in a pharmacy program; thus, the knowledge levels of control students at the end of the semester were significantly higher than those measured immediately after enrollment in the university, so the increase in understanding of the pharmacy profession had no statistical significance in the intervention group when compared with that in the control group.

The major limitations of this study were the single-center nature and the small sample size, which might limit the generalizability of our findings. Therefore, further studies with larger samples should be conducted to replicate and verify our preliminary study. Moreover, because this study was integrated into University Freshman Education, the survey was not anonymous in order to facilitate the contact between teachers and students, which might result in some respondents not being comfortable expressing their true thoughts. To highlight the leading role of students in the interview, the interview questions in this study were not standardized and left up to the students to determine. However, the disunity of interview questions might affect the outcomes among teams. In addition, considering the changes in attitude due to increasing knowledge and involvement in the profession, students from class 2 were selected as the intervention group, and those from class 1 were selected as the control. This grouping method might limit the sample size and cause differences between the two groups in baseline answers and variables such as age. Despite these limitations, our findings on the integration of student-led interview intervention in pharmacy education for effectively enhancing first-year pharmacy students' perceptions and positivity toward the profession are valuable and encouraging.

5. Conclusions

It has been found that the socialization plays a critical role in the development of professional identity. Under the circumstance that no well-accepted pedagogical strategy is available for pharmacy students to promote professional identity formation, this study creatively designed a student-led interview intervention called "Pharmacy from the perspectives of other health professions" and applied it among pharmacy freshmen in a university to enhance their professional identity. Despite the small sample size, our results indicated that this intervention might decrease the proportion of pharmacy freshmen who felt lost about their profession and lead to a marked increase in students' positive attitudes toward the pharmacy profession and pharmacists' role in health care, suggesting that interactions with other professionals outside their own profession appeared to be beneficial in developing pharmacy professional identity.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary material

An example of the approved interview plans. Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jsps.2023.04.008>.

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