Original article

How Vietnamese healthcare students think of nurses: Students stereotypes about Nursing at University of Medicine and Pharmacy at Ho Chi Minh City

Tuong Thi Kim Nguyen[ab], Linh Thuy Khanh Tran[a*], Khoa Duy Duong[a], Tuan Diep Tran[a]

[a]*University of Medicine and Pharmacy at Ho Chi Minh City, Ho Chi Minh City, Vietnam;*
[b]*Soc Trang Community College, Soc Trang province, Vietnam.*

Abstract: *Introduction*: Vietnam's health system increasingly recognizes the importance of interprofessional collaboration and education. Understanding stereotypes and interprofessional attitude could foster successful collaboration. This study aimed to assess stereotypes about nursing amongst healthcare students at University of Medicine and Pharmacy at Ho Chi Minh City. *Method*: We invited nursing, medical, pharmacy and rehabilitation therapy students to complete an online survey before an interprofessional education course in September 2020. Student Stereotypes Rating Questionnaire was used to assess student stereotypes about nursing. Univariate regression was used to analyze the association between stereotypes score and other factors including interprofessional attitude as measured by Readiness for Interprofessional Learning Scale. *Results*: With 102 students invited, 90 students completed the survey. Students were 20-21 years old, 57% were female, and 9% from minor ethnicity. The total attitude score was 80.2 ± 7.2, which meant favorable interprofessional learning. The total stereotype score was 37.1 ± 4.0, considered as high. Stereotype rated in descending order were: Practical skills (4.4), Interpersonal skills (4.3), Ability to be a team player (4.3), Professional competence (4.2), and Confidence (4.2), Ability to make decisions (3.9), Ability to work independently (3.8) and Leadership skills (3.5). There was an association between stereotype and interprofessional attitude total score (Coefficient 0.25, 95%CI: 0.15; 0.36, p-value < 0.01). *Conclusion*: Vietnamese students highly regarded nursing profession, yet stereotypes about nursing existed and students viewed nurses as a capable team player, almost a follower. We need to study how interprofessional education courses could improve students' attitude and stereotypes in future research.

Keywords: healthcare students; interprofessional education; interprofessional collaboration; interprofessional attitude; leadership; medical education; nursing education; roles; responsibility; stereotypes.

1. INTRODUCTION

The World Health Organization (WHO) emphasizes the importance of interprofessional collaboration and education as healthcare services increasingly require team-based practice [1]. Stereotype, defined as *"a set idea that people have about what someone or something is like, especially an idea that is wrong"* [2], could be an obstacle to collaboration,

to communication between all members of the healthcare team and negatively affect the care of patient [3, 4].

Interprofessional education (IPE) *"occurs when two or more professions learn about, from each other to enable effective collaboration and improve health outcomes"* [1]. WHO acknowledges that IPE is an effective intervention to increase collaboration among health professions students,

which enables a future collaboration-ready workforce. IPE helps students to cooperate with each other as a team and helps students understand their and others' roles and responsibilities [1]. There have been studies on healthcare student stereotypes to find methods to enhance interdisciplinary collaboration for future healthcare workers because most healthcare students tend to rate their profession more positively than others' [5-8]. If a stereotype is based on inaccurate perceptions, it can negatively impact group interactions [5, 6]. Changing stereotypes about the healthcare profession is necessary to ensure high quality patient care [1, 9-15]. It is especially poignant about nursing profession as many healthcare students do not fully appreciate the role of nurses in the modern healthcare team [16]. A study found that some students believed that the role of nurses was mainly to support doctors [15].

On stereotypes about nursing in Vietnam, the Ministry of Health and the Vietnam Nursing Association have affirmed that the roles and responsibilities of nurses include giving independent nursing care of patients, along with collaborating with doctors and other healthcare workers [17, 18]. Vietnamese people and healthcare professionals tend to hold the stereotype that the sole role of nurses in the healthcare team is to follow doctors' orders [19]. Nurses are still regarded as assistants to doctors, as illustrated by how the Vietnamese classification list of occupations still uses the designation "*Y tá*" (doctor' assistant in Vietnamese) for nurse [20-22]. Stereotypes about nursing could hamper communication and cooperation between nurses, the biggest shares of healthcare workforce, and other healthcare professionals [23]. Notably, a recent study found that half of the healthcare students thought that only doctors treated illnesses and saved patients' lives [24].

Vietnam's health system is increasingly recognizing the importance of interprofessional collaboration and education. The University of Medicine and Pharmacy at Ho Chi Minh City (UMP-HCMC) was the first health sciences university in Vietnam to launch an IPE course in 2019. From workforce building and education perspective, understanding and transforming student stereotypes about healthcare professions will prepare future healthcare workers to better understand the other healthcare professions, and to respect and to collaborate with others to protect the interests of patients [25, 26]. This is especially true for stereotypes about nursing; however, this topic is not fully clarified in Vietnam.

This study aimed to assess healthcare students' stereotypes about nursing, and to explore factors affecting student stereotypes about nursing.

2. MATERIALS AND METHOD

2.1. Study settings and design

This cross-sectional survey was conducted at UMP-HCMC. The university is a major health sciences university located in the southern region of Vietnam and provides healthcare workforce for the region and other parts of the country. The university is the home to about 15,000 students and has seven faculties including Basic sciences, Medicine, Pharmacy, Dentistry, Public health, Traditional medicine, Nursing and medical technology.

The university organizes five consecutive IPE courses each school year. Each course takes place one day per week and lasts eight weeks. Each course enrolls approximately 200 students, who are grouped into 24 groups with similar structure. Each group has seven to nine students, including one third-year nursing student, one third-year rehabilitation therapy student, three fourth-year medical students, and three fourth-year pharmacy students. The group structure is formed based on the number of enrolled students in each profession program. The reporting of this study was done in accordance with the CROSS checklist [27].

2.2. Participants and sampling methods

The study invited students to answer an online survey one week before the start of the IPE course in September 2020. Students were included if they had never participated in an IPE course and if they agreed to participate in the study. Students were excluded if they had not filled in the questionnaire within the survey time.

With no previous similar study in Vietnam, we used the reported standard deviation of student perception about nursing in an American study [26], which included 528 interprofessional students with similar health professions, for sample size calculation. With the expected standard deviation of 4.7, our study aimed to recruit at least 85 students to get a confidence level of 95% and estimation error of 1 point. Since each course had about 200 students and was divided into groups with similar size and structure, we used stratified random sampling to select randomly 12 groups out of 24 groups. We used the RAND function in Excel to select the groups randomly.

2.3. Data collection and tools

We sent an invitation email to the students' university email address. Upon accessing Microsoft Forms survey link, students were prompted to indicate whether they agreed to complete the survey before reading the actual survey questions. If they chose the "Disagree" option, the survey would automatically end, and no data was collected. We collected demographic information including age, gender (male, female), ethnicity (Kinh, other), professions (nursing, rehabilitation therapy, medical, pharmacy).

Readiness for Interprofessional Learning Scale (RIPLS)

Attitudes toward interprofessional education were assessed using RIPLS, the version developed by McFadyen et al. in 2005 [28]. The instrument was first created to assess whether the students were ready for interprofessional education event, but later used to assess students' interprofessional attitude in general. The RIPLS has 19 questions with four subscales, including nine items about *Teamwork and collaboration* (Q1-Q9), three items about *Negative professional identity* (Q10-Q12), four items about *Positive professional identity* (Q13-Q16), and three items about *Roles and responsibilities* (Q17-Q19) [27]. Each item is on a 5-point Likert scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree). *Negative professional identity* (Q10-Q12) and *Roles and responsibilities* (Q17-Q19) items are negative statements: a lower score shows more favorable attitude toward interprofessional collaboration and education. The scale has shown good reliability [28], and good internal consistency [13].

Student Stereotypes Rating Questionnaire (SSRQ)

Student stereotypes about nursing were assessed using SSRQ, an instrument developed by Ateah et al. in 2011 [29]. The questionnaire includes nine questions about academic ability, leadership ability, ability to be a team player, ability to make decisions, ability to work independently, professional competence, interpersonal skills, practical skills, and confidence. Students answered each question by marking one response on a 5-point Likert scale, ranging from 1 (very low) to 5 (very high). When students had little or no knowledge regarding a characteristic of a profession, they can select "Do not know" for each question. Higher scores represent more positive perceptions. The SSRQ has been validated and widely used in various settings and countries [7, 26, 29-32].

Both SSRQ and RIPLS were translated to Vietnamese and validated according to WHO guideline by a researcher team at UMP-HCMC in an unpublished study (Supplement). For both instruments, mean scores were interpreted as follow: from 4.0 and above was high; from 3.5 to 3.99 was mid-range, and from 3.49 and below was low [6, 7, 29].

2.4. Statistical analysis

We used Microsoft Excel for data management and STATA 10.0 for analysis. Gender, ethnicity, and profession were reported as frequency and percentage when appropriate. Age, total score, and item-scores of SSRQ, total score, subscale-scores, and item-scores of RIPLS were reported as mean and standard deviation. The "Do not know" option in SSRQ was coded as 1-point [33]. For RIPLS, the answers for items Q10–Q12 and Q17–Q19 were reversely scored before adding up to the total score, as was done by McFadyen et al. [28]. Descriptive statistics for individual items were presented using the original scaling.

One-way analysis of variance (ANOVA) or Kruskal Wallis test was used to compare the mean difference in scores of SSQR and RIPLS among groups when appropriate. We used univariate linear regression to explore the association between SSRQ scores (dependent variable) and other factors (independent variables), including age, gender, ethnicity, profession and RIPLS total score. All analyses were done with confidence intervals of 95% and p-value less than 0.05.

2.5. Ethical consideration

This study was approved by the Ethics Committee of UMP-HCMC (Approval No. 852/HĐĐĐ-ĐHYD). Students gave informed consent before data was collected. The data were de-identified before analysis by a non-instructor researcher. Whether the students participated did not affect their performance evaluation in the course.

3. RESULTS

We sent invitation emails to 102 students from the 12 randomly selected groups. Ninety students gave informed consent and completed the survey. The response rate was 88%. Students, who did not respond, reported overlooking the invitation email or forgetting to respond in time. The characteristics of participants were described in Table 1.

Table 1. Demographic information of respondents (N=90)

Characteristics	Frequency (n)	Percentage (%)
Age (years)		20.8 ± 0.5*
20	17	18.9
21	70	77.8
22	3	3.3
Gender		
Male	39	43.3
Female	51	56.7
Ethnicity		
Kinh	82	91.1
Other	8	8.9
Profession		
Nursing	12	13.3
Rehabilitation therapy	7	7.8
Medical	36	40
Pharmacy	35	38.9

*Mean ± Standard Deviation

Interprofessional attitude

The Readiness for Interprofessional Learning Scale showed good internal consistency (Cronbach alpha = 0.84) in the study. The total score of 19 items was 80.2 ± 7.2, ranging from 62 to 95. No statistically significant difference was observed between students in different professions. The total scores, subscale-scores, and item-scores of RIPLS by professions were reported in Table 2.

Subscale mean scores for Teamwork and collaboration and Positive professional identity subscales were 4.4 ± 0.5 and 4.2 ± 0.5 respectively, both above 4.0. Subscale mean scores for Negative professional identity and Roles and responsibilities subscales were respectively 1.8 ± 0.8 and 2.5 ± 0.8, whereas reversed scores were respectively 3.2 and 2.5.

Mean score for item Q17 "*The function of nurses and therapists is mainly to provide support for doctor*" was 2.5 ± 1.2, which was below 3.5 threshold. Numerically, nursing students disagreed with this statement more strongly than other health professions. However, this difference was not statistically significant.

Student stereotypes about nursing

The Student Stereotypes Rating Questionnaire showed good internal consistency (Cronbach alpha = 0.84). The total mean score of nine items was 37.1 ± 4.0, ranging from 28 to 45. No statistically significant difference was observed between students in different professions. The total scores and item-scores of SSRQ about nursing, in all students and by professions, were reported in Table 3.

The SSRQ item mean scores ranged from 3.8 to 4.5. The top three items were Practical skills (4.4 ± 0.5), Interpersonal skills (4.3 ± 0.7), and Ability to be a team player (4.3 ± 0.6). The middle three items were Academic ability (4.1 ± 0.7), Professional competence (4.2 ± 0.6), and Confidence (4.2 ± 0.7). The three least rated items were Ability to make decisions (3.9 ± 0.7), Ability to work independently (3.8 ± 0.8) and Leadership skills (3.5 ± 1.0). Numerically, nursing students rated nursing profession higher than students of other professions in 8 out of 9 items.

Univariate regression analysis results were described in Table 4. There were no association between SSRQ total score and demographic variables including age, gender, ethnicity, and profession. The analysis found an association between SSRQ total score and RIPLS total score (Coefficient 0.25, 95%CI: 0.15; 0.36, p<0.01), which means that the SSRQ score nursing increased by 0.25 points with every point of increase in RIPLS total score.

Table 2. Student attitude about interprofessional collaboration and education, as measured by Readiness for Interprofessional Learning Scale (N=90)

	All students (N=90) M (SD)	Nursing students (n=12) M (SD)	Rehabilitation therapy students (n=7) M (SD)	Medical students (n=36) M (SD)	Pharmacy students (n=35) M (SD)	p-value
Teamwork & collaboration subscale	4.4 (0.5)	4.5 (0.4)	4.4 (0.4)	4.4 (0.6)	4.5 (0.4)	0.67[b]
Q1. Learning with other students will make me a more effective member of a health care team	4.4 (0.7)	4.3 (0.6)	4.3 (1.1)	4.3 (0.8)	4.5 (0.5)	0.81[b]
Q2. Patients would ultimately benefit if health care students worked together	4.6 (0.6)	4.7 (0.5)	4.6 (0.5)	4.4 (0.8)	4.7 (0.5)	0.43[b]
Q3. Shared learning with other health care students will increase my ability to understand clinical problems	4.5 (0.7)	4.7 (0.5)	4.7 (0.5)	4.3 (0.8)	4.6 (0.6)	0.39[b]
Q4. Learning with health-care students before qualification would improve relationships after qualification	4.4 (0.7)	4.3 (0.5)	4.4 (0.5)	4.3 (0.8)	4.5 (0.6)	0.49[a]
Q5. Communication skills should be learned with other health care students	4.3 (0.7)	4.3 (0.6)	4.3 (0.5)	4.3 (0.8)	4.3 (0.6)	0.99[a]
Q6. Shared learning will help me to think positively about other professionals	4.4 (0.7)	4.5 (0.5)	4.1 (0.4)	4.3 (0.9)	4.5 (0.6)	0.56[b]
Q7. For small group learning to work, students need to trust and respect each other	4.6 (0.6)	4.7 (0.5)	4.7 (0.5)	4.5 (0.8)	4.6 (0.5)	0.86[b]
Q8. Team-working skills are essential for all health care students to learn	4.6 (0.5)	4.7 (0.5)	4.3 (0.5)	4.6 (0.5)	4.7 (0.5)	0.22[a]
Q9. Shared learning will help me to understand my own limitations	4.3 (0.6)	4.2 (0.4)	4.4 (0.5)	4.3 (0.6)	4.4 (0.7)	0.68[a]
Negative professional identity subscale	1.8 (0.8)	1.7 (0.8)	2.3 (1.4)	1.8 (0.5)	1.7 (0.8)	0.41[b]
Q10. I don't want to waste my time learning with other health care students	1.8 (0.9)	1.8 (0.9)	2.4 (1.4)	1.9 (0.7)	1.7 (0.9)	0.28[a]
Q11. It is not necessary for undergraduate health-care students to learn together	1.7 (0.8)	1.7 (0.9)	2.3 (1.4)	1.7 (0.7)	1.6 (0.9)	0.27[a]
Q12. Clinical problem-solving skills can only be learned with students from my own department	1.8 (0.8)	1.8 (0.9)	2.1 (1.4)	1.7 (0.5)	1.7 (1.0)	0.74[b]
Positive professional identity subscale	4.2 (0.5)	4.4 (0.5)	4.1 (0.4)	4.3 (0.5)	4.3 (0.5)	0.58[a]
Q13. Shared learning with other health-care students will help me to communicate better with patients and other professionals	4.3 (0.6)	4.5 (0.5)	4.1 (0.4)	4.2 (0.8)	4.5 (0.6)	0.29[a]
Q14. I would welcome the opportunity to work on small-group projects with other health-care students	4.1 (0.6)	4.2 (0.6)	4.0 (0.6)	4.1 (0.6)	4.1 (0.6)	0.92[a]
Q15. Shared learning will help to clarify the nature of patient problems	4.3 (0.6)	4.3 (0.5)	4.0 (0.6)	4.3 (0.6)	4.3 (0.6)	0.61[a]
Q16. Shared learning before qualification will help me become a better team worker	4.4 (0.6)	4.5 (0.9)	4.1 (0.4)	4.4 (0.5)	4.4 (0.6)	0.39[b]
Role and responsibilities subscale	2.5 (0.8)	2.4 (0.8)	2.7 (0.9)	2.6 (0.7)	2.4 (0.8)	0.61[a]
Q17. The function of nurses and therapists is mainly to provide support for doctors	2.5 (1.2)	2.3 (0.9)	2.9 (1.5)	2.4 (1.1)	2.5 (1.3)	0.81[a]
Q18. I'm not sure what my professional role will be	2.1 (0.9)	2.0 (1.0)	2.1 (1.4)	2.2 (0.9)	2.0 (0.8)	0.86[a]
Q19. I have to acquire much more knowledge and skills than other health-care students	3.0 (1.1)	2.9 (1.0)	3.1 (0.7)	3.3 (1.1)	2.8 (1.13)	0.25[a]
Total score [c]	80.2 (7.2)	81.2 (8.5)	77.1 (4.3)	79.1 (7.5)	80.7 (5.9)	0.47[a]

[a] *One-way Analysis of Variance (ANOVA test)*

[b] *Kruskal Wallis test*

[c] *Answers for items Q10–Q12 and Q17–Q19 were reverse scored before adding up to the total score.*

Table 3. Student stereotypes about nursing, as measured by Student Stereotypes Rating Questionnaire (N=90)

Items of Student Stereotypes Rating Questionnaire	All students (N=90) M (SD)	Nursing students (n=12) M (SD)	Rehabilitation therapy students (n=7) M (SD)	Medical students (n=36) M (SD)	Pharmacy students (n=35) M (SD)	p-value	Other-than-nursing students (n=78) M (SD)	p-value
Academic ability	4.1 (0.7)	4.3 (0.5)	4.0 (0.0)	4.1 (0.9)	4.1 (0.6)	0.63[a]	4.1 (0.6)	0.28[b]
Professional competence	4.2 (0.6)	4.3 (0.5)	4.1 (0.4)	4.3 (0.8)	4.2 (0.6)	0.86[a]	4.2 (0.6)	0.59[b]
Interpersonal skills	4.3 (0.7)	4.5 (0.5)	4.3 (0.8)	4.3 (0.7)	4.3 (0.7)	0.80[a]	4.3 (0.7)	0.34[b]
Leadership abilities	3.5 (1.0)	3.8 (0.7)	3.1 (1.6)	3.5 (0.9)	3.6 (1.0)	0.50[a]	3.6 (0.7)	0.36[b]
Ability to work independently	3.8 (0.8)	4.0 (0.6)	3.6 (1.3)	3.6 (1.0)	3.9 (0.6)	0.36[a]	3.8 (0.7)	0.35[b]
Ability to be a team player	4.3 (0.6)	4.2 (0.4)	4.1 (0.4)	4.3 (0.6)	4.4 (0.6)	0.45[a]	4.3 (0.6)	0.58[b]
Ability to make decisions	3.9 (0.7)	4.1 (0.7)	3.9 (0.4)	3.9 (0.8)	3.9 (0.7)	0.84[a]	3.9 (0.7)	0.36[b]
Practical skills	4.4 (0.5)	4.4 (0.5)	4.4 (0.5)	4.4 (0.5)	4.4 (0.6)	0.99[a]	4.4 (0.5)	1.00[b]
Confidence	4.2 (0.7)	4.4 (0.8)	4.1 (0.4)	4.1 (0.8)	4.1 (0.6)	0.63[a]	4.1 (0.7)	0.18[b]
Total score	37.1 (4.0)	38.1 (3.8)	36.6 (2.2)	36.9 (4.3)	37.1 (4.1)	0.81[a]	36.9 (4.0)	0.33[b]

[a] *One-way analysis of variance (ANOVA test)*
[b] *Two-sample t-test comparing nursing students and other students.*

Table 4. Univariate regression analysis between dependent variable (SSRQ about nursing) and independent variables (age, gender, ethnicity, profession, RIPLS total score) (N=90)

	SSRQ		
	Coefficient	95%CI	p-value
Age (years)			
20			
21	-0.24	-2.53; 2.04	0.83
22	1.33	-3.95; 6.62	0.62
Gender			
Female			
Male	1.02	-0.75; 2.80	0.26
Ethnicity			
Other			
Kinh	-1.80	-4.90; 1.29	0.25
Profession			
Nursing			
Rehabilitation therapy	-2.37	-6.38; 1.64	0.24
Medical	-1.56	-4.36; 1.25	0.27
Pharmacy	-1.08	-3.90; 1.74	0.45
RIPLS total score	0.25	0.15; 0.36	**<0.001**

RIPLS: The Readiness for Interprofessional Learning Scale; SSRQ: Student Stereotypes Rating Questionnaire; CI: Confidence interval

4. DISCUSSION

The participant age, gender and ethnicity characteristics were typical for mid-training healthcare students in urban Vietnam. The students were younger compared to western studies since they went directly to health professions training directly from high school in Vietnam [29]. There were more female students in health sciences university, especially in nursing. Most students were of Kinh ethnicity, the ethnic majority in Vietnam, and less than 10% were of other ethnicities. Our population was generalizable to other mid-training healthcare students in Vietnam, especially at urban health sciences universities [34, 35].

Interprofessional attitude

The total mean score of RIPLS was 80.2 ± 7.2, which meant an average score of 4.2 points per item. This finding was higher than of an Indonesian study by Lestari E et al. (2016) including 248 medical, nursing, midwifery, and dentistry students with a total score of 68.5 ± 6.1 [36]. However, the finding was lower than the result of a Saudi Arabian study by Alruwaili A et al. (2020) including 233 undergraduate interprofessional healthcare students with a score of 86.8 ± 11.6 [14]. This finding showed that students had a favorable attitude toward interprofessional collaboration and education and were ready for an IPE course. However, there might be a gap between the baseline interprofessional attitude in Vietnam and other developed countries.

Subscale mean scores for *Teamwork and collaboration* and *Positive professional identity* subscales were both high in our studies. These scores showed that healthcare students had a willingness to cooperate and work in a team and were open to shared learning experiences. The results were similar to previous studies conducted on healthcare students [13, 37, 38] and on practicing health professionals [39]. However, the *Negative professional identity* and *Roles and responsibilities* subscales in our study had reversed scores of 3.2 and 2.5 respectively, both considered low or less favorable attitude. The finding was similar to that reported by Al-Shaikh et al (2018) when healthcare students might have thought that the patient's problems should be solved within each profession [15].

The *Roles and responsibilities* subscale had the lowest reversed score in our study, of only 2.5. The less favorable subscale score might be due to the lack of clinical exposure at the time of survey. As a pre-course survey, the results showed that the students might need more collaboration opportunities to know the role and responsibility of different professions. This result might help educators to strengthen the provision of knowledge on the roles and responsibilities of each profession in interprofessional collaborative practice.

Notably, the item Q17. *The function of nurses and therapists is mainly to provide support for doctors* had an alarmingly low score of 2.5. The result was similar to that of the study by Al-Shaikh et al (2018) where both medical and dental students thought that function of nurses was only to support doctors [15]. This problem was also previously reported in Vietnam where healthcare students did not fully acknowledge the roles and responsibilities of nurses [37]. Numerically, nursing students disagreed more strongly with this item than students of other professions, which could suggest the self-acknowledgement of their own profession.

Student stereotypes about nursing

Total mean score of SSRQ about nursing was 37.1 ± 4.0, which meant an average of about 4.1 points per item. According to our pre-determined thresholds, the score was high and showed that nursing was highly regarded by the respondents. The result was higher than that of a study by White et al. including 22 undergraduate public health students with a total SSRQ score of 32.7 ± 11.4 [32]. However, the result was lower than of an American study including 528 students from six different professions with a total SSRQ score of 39.5 ± 4.7 [26]. The observed differences might be due to differences in student populations.

Even though nursing was highly regarded by healthcare students in our study, looking at the item-scores revealed a more nuanced picture of nurses. Out of nine, six item-scores were above 4.0 and considered high (Table 3). These results were similar to those of a study by Ateah et al. with scores ranging from 4.5 to 4.8 [29], and a study by Hean et al. with mean scores ranging from 4.2 to 4.5 [7]. Like in other countries, the results showed that healthcare students in Vietnam had appreciation for nurses' qualities: good practical skills, professional competences, confidence; effective communication and collaboration skills; and good academic ability.

However, the students rated the *ability to make decisions*, *ability to work independently*, and *leadership ability* of nurse

only average. Notably, the *leadership ability* of nurses was only rated as 3.5. The results were similar to that of a Canadian study by Ateah et al. where the three items were also rated as average, ranging from 3.8 to 3.9 [29]. These results might be due to traditional model of healthcare team where nurses and other team members heavily depends on physicians. It is still common perception and practice that nurses work and follow physician orders in Vietnamese healthcare system. Instead of nurses, the doctors dictate the level or form of nursing care for the patients. In response to this, Vietnamese regulations have recognized more the importance of the nurse's roles and responsibilities as a healthcare profession in its own right, not simply an assistant to doctors [20, 21]. Nurses have been trained with a higher level of professionalism. They are expected now to assess the patients, make nursing diagnosis, discuss and implement management plan with other healthcare team members. The stereotypes that nurses have lower *ability to make decisions*, *ability to work independently*, and *leadership ability* could be a barrier for them to share their professional opinions and actively engage in healthcare team activities. The results were meaningful for health profession educators and suggested that IPE course should give nursing students opportunities to show and develop their abilities in these domains, especially the leadership ability.

Numerically, nursing students assessed about nursing (auto-stereotypes) higher than other healthcare students (hetero-stereotypes), across total scores and most item-scores. In addition to the finding of Q17 item of RIPLS, this pattern further suggest that nursing students had self-acknowledgement and were proud of their profession. Previous study also showed that students tended to rate their own professions higher than students of other professions do [5-8].

Factors affecting student stereotypes about nursing

We found no association between SSRQ total score about nursing and demographic characteristic including age, gender, and ethnicity. Notably, the analysis found a statistically significant association between SSRQ total score and RIPLS total score. We hypothesized that students who had more favorable attitude toward interprofessional collaboration and education would also have more positive stereotypes about nursing. Further studies are needed to better understand which subscales or domains of RIPLS have the strongest association with student stereotypes. This finding also suggested the importance of an IPE course on student interprofessional attitude and stereotypes. A study has shown that an effective IPE program could help students feel more willing to engage in interprofessional collaborative activities [40]. For students with less favorable interprofessional attitude, educators should provide information on the roles and responsibilities of nursing in the interprofessional healthcare team through simulations to reduce stereotypes and increase students' respect for nursing profession [41]. More studies are warranted to better understand how IPE could transform student interprofessional attitudes and stereotypes, especially about nursing.

Limitations

This cross-sectional study had certain limitations. First, even though minimum sample size was met, a larger sample size could increase the results' certainty. Future studies should

include more nursing and rehabilitation therapy students to achieve a more balanced population. Second, the study could not address other potential factors affecting students' responses on interprofessional attitude and stereotypes about nursing. One such factor could have been the growing social expectation that valued teamwork and collaboration. A comparative appraisal of stereotypes about nursing and about other professions would mitigate this confounder effect. Third, as one previous study show that cultural idealization of femininity could affect stereotypes about nursing [42], our study could not assess the possible association between Vietnamese social view of women and student stereotypes about nursing. Finally, to the extent of our knowledge, our study was the first on student stereotypes about nursing in Vietnam; therefore, we could not relate the results to other Vietnamese studies given the distinctive health system and culture characteristics.

Conclusion

In general, our study found that Vietnamese healthcare students highly regarded nursing profession. However, stereotypes about nursing existed and students viewed nurses as someone who had good practical and communication skills, and had less abilities to make decision, to work independently and to lead. In short, nurses were considered a capable team player, almost followers. Positive student stereotypes about nursing were associated with more favorable interprofessional attitude. We need to study how IPE courses could improve interprofessional attitude and student stereotypes in future research.

FUNDING

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ACKNOWLEDGEMENTS

AUTHORS' CONTRIBUTION

NTKT, TTKL, DDK, and TDT designed the study. NTKT and DDK collected data. TDT, TTKL, NTKT and DDK analyzed data and drafted the manuscript. All authors contributed to data interpretation, revised, and approved the final manuscript.

ORCID ID

Tuong Thi Kim Nguyen https://orcid.org/0000-0002-8738-2114
Linh Thuy Khanh Tran https://orcid.org/0000-0001-6735-846X
Khoa Duy Duong https://orcid.org/0000-0003-2277-9652
Tuan Diep Tran https://orcid.org/0000-0002-3355-7951

REFERENCES

1. Gilbert JH, Yan J, Hoffman SJ. A WHO report: framework for action on interprofessional education and collaborative practice. Journal of allied health. 2010;39 Suppl 1:196-7. Epub 2010/12/22. PubMed PMID: 21174039.

2. Cambridge University Press. Cambridge Dictionary. Stereotype; [cited 2021 May 30]. Available form: https://dictionary.cambridge.org/vi/dictionary/english/stereotype.

3. Reeves S, Fletcher S, Barr H, Birch I, Boet S, Davies N, et al. A BEME systematic review of the effects of interprofessional education: BEME Guide No. 39. Medical teacher. 2016;38(7):656-68. Epub 2016/05/06. doi: 10.3109/0142159x.2016.1173663. PubMed PMID: 27146438.

4. Gilfoyle E, Koot DA, Annear JC, Bhanji F, Cheng A, Duff JP, et al. Improved Clinical Performance and Teamwork of Pediatric Interprofessional Resuscitation Teams with a Simulation-Based Educational Intervention. Pediatric critical care medicine: a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies. 2017;18(2): e62-e9. Epub 2017/02/06. doi: 10.1097/pcc.0000000000001025. PubMed PMID: 28157808.

5. Karey Cook P, DPT & Judith Stoecker, PT, PhD. Healthcare Student Stereotypes: A Systematic Review with Implications for Interprofessional Collaboration. Interprofessional Practice and Education. 2014;4(2):6;10.

6. Thurston MM, Chesson MM, Harris EC, Ryan GJ. Professional Stereotypes of Interprofessional Education Naive Pharmacy and Nursing Students. American journal of pharmaceutical education. 2017;81(5):84. Epub 2017/07/20. doi: 10.5688/ajpe81584. PubMed PMID: 28720912; PubMed Central PMCID: PMCPmc5508083.

7. Hean S, Clark JM, Adams K, Humphris D. Will opposites attract? Similarities and differences in students' perceptions of the stereotype profiles of other health and social care professional groups. Journal of interprofessional care. 2006;20(2):162-81. Epub 2006/04/13. doi: 10.1080/13561820600646546. PubMed PMID: 16608718.

8. Bell L, & Allain, L. Exploring professional stereotypes and learning for interprofessional practice: An example from UK qualifying level social work education. Social Work Education. 2011;30(3):266-80.

9. Suter E, Arndt J, Arthur N, Parboosingh J, Taylor E, Deutschlander S. Role understanding and effective communication as core competencies for collaborative practice. Journal of interprofessional care. 2009;23(1):41-51. Epub 2009/01/15. doi: 10.1080/13561820802338579. PubMed PMID: 19142782.

10. Kesselheim JC, Stockman LS, Growdon AS, Murray AM, Shagrin BS, Hundert EM. Discharge Day: A Case-Based Interprofessional Exercise About Team Collaboration in Pediatrics. MedEdPORTAL: the journal of teaching and learning resources. 2019;15:10830. Epub 2019/10/05. doi: 10.15766/mep_2374-8265.10830. PubMed PMID: 31583273; PubMed Central PMCID: PMCPmc6759138.

11. George KL, Quatrara B. Interprofessional Simulations Promote Knowledge Retention and Enhance Perceptions of Teamwork Skills in a Surgical-Trauma-Burn Intensive Care Unit Setting. Dimensions of critical care nursing: DCCN. 2018;37(3):144-55. Epub 2018/03/30. doi: 10.1097/dcc.0000000000000301. PubMed PMID: 29596291.

12. Al-Qahtani MF, Guraya SY. Measuring the attitudes of healthcare faculty members towards interprofessional education in KSA. Journal of Taibah University Medical Sciences. 2016;11(6):586–93.

13. Williams B, McCook F, Brown T, Palmero C, McKenna L, Boyle M, et al. Are Undergraduate Health Care Students "Ready" for Interprofessional Learning? A Cross-Sectional Attitudinal Study. The Internet Journal of Allied Health Sciences and Practice 2012;10(3).

14. Alruwaili A, Mumenah N, Alharthy N, Othman F. Students' readiness for and perception of Interprofessional learning: a cross-sectional study. BMC Medical Education. 2020 Oct 29;20(1):390. doi: 10.1186/s12909-020-02325-9. PMID: 33121482; PMCID: PMC7597065.

15. Al-Shaikh GK, Al-Madi EM, Masood J, Shaikh Q, Syed SB, Bader RS, McKimm J. Interprofessional learning experiences: Exploring the perception and attitudes of Saudi Arabian medical and dental students. Medical Teacher. 2018 Sep;40 (sup1): S43-S48. doi: 10.1080/0142159X.2018.1465180. Epub 2018 May 2. PMID: 29720009.

16. Chau JPC, Lo SHS. Fostering gerontology students' competence in Interprofessional collaborative practice. 2020;20(1):388. doi: 10.1186/s12909-020-02273-4. PubMed PMID: 33109173.

17. Ministry of Health of the Socialist Republic of Vietnam. Joint Circular No: 07/2011/TT-BYT, Circular Guiding the Nursing in hospitals; [cited 2020 May 30]. Available form: https://thuvienphapluat.vn/van-ban/The-thao-Y-te/Thong-tu-07-2011-TT-BYT-huong-dan-cong-tac-dieu-duong-cham-soc-nguoi-benh-118433.aspx.

18. Vietnam Nurses Association. Roles of Vietnam Nurses Association in Policy Advocating – Past Successes and Current Challenges, ACiNE 4th 2021; [cited 2021 December 20]. Available form: http://hoidieuduong.org.vn/tin-tuc/roles-of-vietnam-nurses-association-in-policy-advocating-past-successes-and-current-challenges.

19. Luong Ngoc Khue. Nursing work results in 2015 and main mission in 2016 - 2017. Agency of Health Examination and Treatment. Ministry of Health. Vietnam. 2015;40p.

20. Ministry of Home Affairs of the Socialist Republic of Vietnam. Decision No: 41/2005/QD-BNV of the Minister of Interior on issuing professional standard of scales of health nurses; [cited 2021 May 30]. Available form: https://thuvienphapluat.vn/van-ban/Bo-may-hanh-chinh/Quyet-dinh-41-2005-QD-BNV-Tieu-chuan-nghiep-vu-ngach-vien-chuc-y-te-dieu-duong-4729.aspx.

21. Ministry of Health - Ministry of Interior of the Socialist Republic of Vietnam. Joint Circular No: 26/2015/TTLT-BYT-BNV stipulating codes and standards for professional titles of nursing, midwifery, and medical technicians; [cited 2021 May 30]. Available form: https://thuvienphapluat.vn/van-ban/Lao-dong-Tien-luong/Thong-tu-lien-tich-26-2015-TTLT-BYT-BNV-ma-so-tieu-chuan-chuc-danh-nghe-dieu-duong-ho-sinh-ky-thuat-y-294587.aspx.

22. Prime Minister. Decision No: 34/2020/QD-TTG Introducing Classification list of Occupations of Vietnam; [cited 2021 May 30]. Available form: https://thuvienphapluat.vn/van-ban/Lao-dong-Tien-luong/Quyet-dinh-34-2020-QD-TTg-Danh-muc-nghe-nghiep-Viet-Nam-su-dung-trong-thong-ke-ve-lao-dong-458436.aspx.

23. Gergerich E, Boland D, Scott MA. Hierarchies in interprofessional training. Journal of interprofessional care. 2019;33(5):528-35. Epub 2018/11/02. doi: 10.1080/13561820.2018.1538110. PubMed PMID: 30383437.

24. Nguyen V Y Lan. Finding perception about ethics of medical students [dissertation]. [Pittsburgh (PA)]: Viet Nam National University Ho Chi Minh City; 2019. 51;54p.

25. Cahn PS, Tuck I, Knab MS, Doherty RF, Portney LG, Johnson AF. Competent in any context: An integrated model of interprofessional education. Journal of interprofessional care. 2018:1-4. Epub 2018/07/25. doi: 10.1080/13561820.2018.1500454. PubMed PMID: 30040509.

26. Michalec B, Giordano, C., Dallas, S., & Arenson, C.. A longitudinal mixed-methods study of IPE students' perceptions of health profession groups: Revisiting the Contact Hypothesis. Journal of Interprofessional Education & Practice. 2017;6:71-9.

27. Sharma A, Minh Duc NT, Luu Lam Thang T, Nam NH, Ng SJ, Abbas KS, et al. A Consensus-Based Checklist for Reporting of Survey Studies (CROSS). J Gen Intern Med. 2021 Oct;36(10):3179-3187. doi: 10.1007/s11606-021-06737-1. Epub 2021 Apr 22. PMID: 33886027; PMCID: PMC8481359.

28. McFadyen AK, Webster VS, Maclaren WM. The test-retest reliability of a revised version of the Readiness for Interprofessional Learning Scale (RIPLS). Journal of interprofessional care. 2006;20(6):633-9. Epub 2006/11/11. doi: 10.1080/13561820600991181. PubMed PMID: 17095441.

29. Ateah CA, Snow W, Wener P, MacDonald L, Metge C, Davis P, et al. Stereotyping as a barrier to collaboration: Does interprofessional education make a difference? Nurse education today. 2011;31(2):208-13. Epub 2010/07/27. doi: 10.1016/j.nedt.2010.06.004. PubMed PMID: 20655633.

30. El-Awaisi A, Awaisu A, Jaam M, Saffouh El Hajj M, Verjee MA. Does the delivery of interprofessional education have an effect on stereotypical views of healthcare students in Qatar? Journal of interprofessional care. 2020 Jan-Feb;34(1):44-49. doi: 10.1080/13561820.2019.1612863. Epub 2019 May 7. PMID: 31064272.

31. Patel Gunaldo T, Augustus-Wallace A, Brisolara KF, Hicks MN, Mercante DE, Synco T, et al. Improving stereotypes: The impact of interprofessional education in pre-health students. Journal of interprofessional care. 2021;35(5):794-8. Epub 2020/08/26. doi: 10.1080/13561820.2020.1806218. PubMed PMID: 32838602.

32. White S, Lambert, S., Visker, J., Banez, J. C., Lasser, B., Cichon, T., … Cox, C. Public health education student stereotypes of other health professions before and after an interprofessional education program. Health Professions Education. 2018;5(2):120-5.

33. Presser JaKaS. Question and Questionnaire Design. second ed. Emerald Group Publishing Limited. 2010; 181-285p.

34. Ngo L H Giang. Nursing students' perceptions of theoretical and clinical learning environments [dissertation]. [Pittsburgh (PA)]: University of Medicine and Pharmacy at Ho Chi Minh City; 2017.28p.

35. General Statistics Office of Vietnam. Completed Results of the 2019 Viet Nam Population and Housing Census. Statistical Publishing House 2020 [cited 30 May 2021]. Available from: https://www.gso.gov.vn/wp-content/uploads/2019/12/Ket-qua-toan-bo-Tong-dieu-tra-dan-so-va-nha-o-2019.pdf.

36. Lestari E, Stalmeijer RE, Widyandana D, Scherpbier A. Understanding students' readiness for interprofessional learning in an Asian context: a mixed-methods study. BMC medical education. 2016;16:179. Epub 2016/07/17. doi: 10.1186/s12909-016-0704-3. PubMed PMID: 27422207; PubMed Central PMCID: PMCPmc4946087.

37. Sara S, Ana W. Healthcare students perception of their readiness for interprofessional learning [dissertation]. [Pittsburgh (PA)): Uppsala Universitet; 2018. 18p.

38. Mèche P, Meyenberg CL, Douchamps L, Wyndham-White C, Ibrahimovic A, Jeannot E. Students' Readiness and Perception of Interprofessional Learning in an Undergraduate Swiss Healthcare Student Context: A Cross Sectional Study. Journal of Allied Health. 2016 Summer;45(2): e11-4. PMID: 27262475.

39. Johnson SW, & Mathieson, K. The effects of demographics on physician assistant attitudes and openness towards interprofessional medical collaboration and education. Journal of Interprofessional Education & Practice. 2020;19,:100333.

40. Knieper MJ, Bhatti JL, Dc EJT. Perceptions of chiropractic students regarding interprofessional health care teams. Journal of Chiropractic Education. 2021 Jul 28. doi: 10.7899/JCE-20-9. Epub ahead of print. PMID: 34320646.

41. Kukko P, Silén-Lipponen M, Saaranen T. Health care students' perceptions about learning of affective interpersonal communication competence in interprofessional simulations. Nurse Education Today. 2020 Nov; 94:104565. doi: 10.1016/j.nedt.2020.104565. Epub 2020 Aug 27. PMID: 32916408.

42. Johansson EE, Hamberg K. From calling to a scheduled vocation: Swedish male and female students' reflections on being a doctor. Medical teacher. 2007;29(1):e1-8. Epub 2007/06/01. doi: 10.1080/01421590601044992. PubMed PMID: 17538822.