

HEALTHCARE STUDENTS' READINESS OF INTERPROFESSIONAL LEARNING IN CAN THO UNIVERSITY OF MEDICINE AND PHARMACY: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: The World Health Organization emphasizes the significance of interprofessional collaboration and education. Being aware of the value of collaboration among professionals within the healthcare team, the university in Vietnam has tended to prepare students for teamwork through interprofessional education. However, the success of interprofessional education is contingent upon the students' attitudes. **Objectives:** To identify students' attitudes at Can Tho University of Medicine and Pharmacy toward interprofessional learning and explore factors affecting their readiness for the program. **Materials and methods:** A cross-sectional study on 301 Can Tho University of Medicine and Pharmacy students in ten majors, responding to an online survey from May to July of 2023 using the Readiness for Interprofessional Learning Scale. Besides, we collected demographic information including age, gender, ethnicity, major, academic years, and info learned/experienced in the interprofessional education of students. Multivariate regression was used to explore factors affecting students' readiness for interprofessional learning. **Results:** Students replied to the questionnaire. All of them had no experience in interprofessional education (100%); almost all participants were Kinh ethnicity (91.7%), and female (72.8%). The average age was 19.9 ± 0.7 years old. Students studying in the 2nd year were 65.8%. Nursing students account for the highest proportion (21.3%). The total score on the 19-item Readiness for Interprofessional Learning Scale rated by 301 students was 72.2 ± 8.2 . The Positive professional identity subscale scored 4.1 ± 0.6 while the Teamwork and collaboration subscale scored 4.2 ± 0.5 . The subscales measuring Negative professional identity and Roles and responsibilities had mean scores of 2.7 ± 1.1 and 3.4 ± 0.8 , respectively. The study found an association between the subscale's score and the profession and ethnicity of students. **Conclusion:** Most students are ready for interprofessional learning, educators need to study how to build and introduce interprofessional education for them.

Keywords: healthcare students; interprofessional education; interprofessional collaboration; interprofessional attitude; medical education.

I. INTRODUCTION

The World Health Organization highlights the need for interprofessional education (IPE) and interprofessional collaboration because of the growing need for team-based practice in healthcare systems [1]. IPE “occurs when two or more professions learn about, from each other to enable effective collaboration and improve health outcomes” [1]. Research has revealed increases in undergraduate students' professional identities and attitudes toward teamwork in programs related to the healthcare profession [2], [3], [4].

The value of interprofessional education and teamwork is being acknowledged by Vietnam [5]. A positive attitude toward IPE raises the probability of a successful result. This is particularly true for healthcare education systems in other nations; yet, Vietnam lacks clarification on this issue, particularly at the Can Tho University of Medicine and Pharmacy (CTUMP). The university is

developing a curriculum education for healthcare students according to an integrated direction and the built IPE program is necessary. To find the attitudes of students at the CTUMP toward interprofessional learning, this study used the Readiness for Interprofessional Learning Scale (RIPLS) to evaluate undergraduate healthcare students' readiness for interprofessional learning and to explore factors affecting students' readiness.

II. MATERIALS AND METHODS

2.1. Study settings and design:

A cross-sectional design was conducted at CTUMP [6].

2.2. Participants and sampling methods

Data collection was carried out from May to July 2023 at CTUMP. The CTUMP has ten undergraduate programs, including Medical Imaging Technology (MIT), Laboratory Medicine Technique (LMT), Public Health (PH), Midwifery, Nursing, Pharmacy, Traditional, Medicine (TM), Preventive Medicine (PM), Odonto-Stomatology (OS), General Medicine (GM). The inclusion criteria were students in the first, second academic years, and were willing to participate in the study. Students learning the first academic year did not practice at the hospital, while almost all students learning the second academic year practiced in the hospital. We selected these students to determine whether healthcare environments affect their readiness for interprofessional learning. Besides, other researchers had evidence to introduce IPE early to students so that they could have early clinical practice or observation experience in the first or second years of the course [7]. Students were excluded if they did not complete the questionnaire within the survey time to ensure consistency in the sample.

Sample size calculation was done by the formula: $n \geq \frac{z_{1-\frac{\alpha}{2}}^2 \cdot \alpha(1-p)p}{d^2}$, where n is minimum sample size, $z_{1-\frac{\alpha}{2}}=1.96$: Z statistic for a level of confidence at $\alpha = 0.05$, $d=0.05$ precision, $p=0.09$ is result from research of Alruwaili et al. (2020) [8]. From the formula, the research sample was $n \geq 126$. Using simple random sampling, there were 301 student respondents involved in this study.

2.3. Data collection and tools

The Information Technology Office of CTUMP provided the email addresses of students. We sent an invitation to the student's CTUMP email with the Microsoft Forms survey link. Upon accessing this survey link, students were prompted to indicate whether they agreed to complete the survey before reading the actual survey questions. If they choose the "Disagree" option, the survey will automatically end. It also ensures that the survey responses are obtained from willing participants ready to join the study. We collected demographic information including age, gender, ethnicity, major, academic years, and info experienced in IPE of students. The Readiness for Interprofessional Learning Scale (RIPLS) used to measure attitudes regarding IPE was created by McFadyen (2005) [9]. This scale has 19 items across for subscales: Teamwork and collaboration subscales (9-items), Negative professional identity subscales (3-items), Positive professional identity subscales (4-items), and Roles and responsibilities subscales (3-items). Each item was scored using a 5-point Likert scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree). The scale was reported to have good internal consistency and reliability [3, 9]. RIPLS was used to survey students studying IPE courses at the University of Pharmacy at Ho Chi Minh City (UMP)

in 2021. As in the previous study [10], the mean scores were further classified as high (4.0 and above), medium (3.5 to 3.99), and low (3.49 and below). The total score of RIPLS is calculated by summing the scores across all items. The total score on the scale ranges from 19 to 95, with higher scores indicating a greater readiness for IPE.

2.4. Statistical analysis

We used Microsoft Excel for data management and STATA 16.0 for analysis. Age, gender, ethnicity, academic years, and profession were reported as frequency and percentage. RIPLS scores were converted to total scores, and subscale scores were reported as mean and standard deviation. The ANOVA and the Kruskal-Wallis test were used to compare the mean difference in scores of RIPLS among groups when appropriate. We used multivariate linear regression to explore the association between a score of subscales of RIPLS and associated factors. All analyses were done with confidence intervals of 95% and p-values less than 0.05.

2.5. Ethical consideration: This study was approved by the Ethics Committee of CTUMP (No. 23.018.GV/PCT-HĐĐĐ).

III. RESULTS

3.1. Characteristics of the participants

Table 1. Demographic information of respondents (n=301)

Characteristics	Frequency (n)	Percentage (%)	Characteristics	Frequency (n)	Percentage (%)
Age (years)		19.9 ± 0.7*	Academic year		
20-21	295	98.0	1 st year	103	34.2
22-24	6	2.0	2 nd year	198	65.8
Gender			Have students learned or experienced IPE?		
Male	82	27.2	Yes	00	00
Female	219	72.8	No	301	100
			Profession		
			1. Medical Imaging Technology (MIT)	12	4.0
			2. Laboratory Medicine Technique (LMT)	28	9.3
			3. Public Health (PH)	13	4.3
			4. Midwifery	50	16.6
			5. Nursing	65	21.3
			6. Pharmacy	23	7.6
			7. Traditional Medicine (TM)	18	6.0
Ethnicity			8. Preventive Medicine (PM)	21	7.0
Kinh	276	91.7	9. Odonto-Stomatology (OS)	10	3.3
Other	25	8.3	10. General Medicine (GM)	62	20.6

*Mean ± Standard Deviation

A total of 301 participants completed this questionnaire. All of them had no experience in IPE (100%); almost all participants were Kinh ethnicity (91.7%), and female (72.8%). The age group of 20-21 years old accounts for 98.0%. Nursing students account for the highest proportion (21.3%).

3.2. Students' attitudes toward readiness for interprofessional learning

Table 2. Students' attitudes about interprofessional education, as measured by the Readiness for Interprofessional Learning Scale (n=301)

Students	Subscale of RIPLS				Total score ^c of RIPLS M(SD)
	Teamwork and collaboration M(SD)	Negative professional identity M(SD)	Positive professional identity M(SD)	Role and responsibilities M(SD)	
MIT	4.5(0.5)	2.9(1.2)	4.4(0.5)	3.6(0.7)	75.1(7.9)
LMT	4.2(0.7)	2.5(0.9)	4.1(0.8)	3.3(0.8)	72.5(9.1)
PH	4.2(0.4)	3.1(1.2)	4.1(0.4)	3.6(0.8)	70.5(6.7)
Midwifery	4.2(0.4)	2.7(1.0)	4.0(0.5)	3.5(0.7)	70.8(5.9)
Nursing	4.2(0.6)	2.6(1.1)	4.0(0.6)	3.4(0.8)	71.8(8.5)
Pharmacy	4.2(0.5)	2.1(0.6)	4.1(0.5)	2.9(0.7)	74.7(5.7)
TM	4.4(0.5)	2.7(1.2)	4.3(0.5)	3.3(0.6)	74.5(8.1)
PM	4.3(0.4)	3.7(1.1)	4.3(0.5)	4.1(0.6)	68.7(4.5)
OS	3.9(0.5)	2.6(1.0)	3.9(0.9)	3.5(0.6)	68.9(13.9)
GM	4.3(0.6)	2.6(1.2)	4.2(0.7)	3.4(0.8)	73.6(9.7)
p-value	0.30 ^b	<0.01 ^a	0.13 ^b	<0.01 ^a	<0.05 ^b
All students (n=301)	4.2(0.5)	2.7(1.1)	4.1(0.6)	3.4(0.8)	72.2(8.2)

^aANOVA test; ^bKruskal Wallis test; M(SD):Mean(Standard Deviation)
^cAnswers for items I10-I12 and I17-I19 were reversed before adding up to the total score

The total score on the 19-item RIPLS rated by 301 students was 72.2 ± 8.2. There was statistically significant difference in the total score of this measure between students who were in different professional fields. Table 2 presented the RIPLS total scores, subscale scores by professions.

3.3. Factors associated with students' readiness for interprofessional learning

Table 3. Association between participants' characteristics and readiness for interprofessional learning (n = 301)

Variables	Readiness for interprofessional learning			
	Teamwork and collaboration Coef (p-value)	Negative professional identity Coef (p-value)	Positive professional identity Coef (p-value)	Role and responsibilities Coef (p-value)
Age (years)				
20-21				
22-24	0.02 (0.93)	0.09 (0.85)	-0.01 (0.97)	-0.14 (0.67)
Gender				
Female				
Male	0.02 (0.81)	0.22 (0.17)	-0.06 (0.48)	0.09 (0.44)
Ethnicity				
Other				
Kinh	0.01 (0.98)	-0.28 (0.22)	-0.07 (0.61)	-0.37 (0.02)
Academic year				
1 st year				
2 nd year	-0.01 (0.94)	-0.26 (0.08)	-0.09 (0.29)	-0.06 (0.52)

Variables	Readiness for interprofessional learning			
	Teamwork and collaboration Coef (p-value)	Negative professional identity Coef (p-value)	Positive professional identity Coef (p-value)	Role and responsibilities Coef (p-value)
*Profession				
MIT				
LMT	-0.36 (0.06)	-0.41 (0.26)	-0.38 (0.07)	-0.32 (0.21)
PH	-0.31 (0.17)	0.14 (0.75)	-0.38 (0.13)	-0.01 (0.99)
Midwifery	-0.34 (0.06)	-0.09 (0.80)	-0.48 (0.02)	-0.05 (0.86)
Nursing	-0.33 (0.07)	-0.24 (0.49)	-0.46 (0.02)	-0.19 (0.42)
Pharmacy	-0.34 (0.09)	-0.81 (0.04)	-0.47 (0.04)	-0.72 (0.01)
TM	-0.14 (0.49)	-0.14 (0.73)	-0.17 (0.46)	-0.23 (0.41)
PM	-0.20 (0.31)	-0.96 (0.02)	-0.15 (0.52)	0.49 (0.07)
OS	-0.59 (0.01)	-0.42 (0.36)	-0.56 (0.03)	-0.19 (0.55)
GM	-0.23 (0.19)	-0.36 (0.28)	-0.27 (0.16)	-0.27 (0.26)

Multivariate regression analysis results are described in Table 3. The analysis found an association between the RIPLS score and the profession, ethnicity of the student.

IV. DISCUSSION

RIPLS had a total mean score of 72.2 ± 8.2 . The outcome was not as high as the results of a Saudi Arabian study conducted by Alruwaili A et al. (2020) with a score of 86.8 ± 11.6 among 233 undergraduate healthcare students [8]. The result is lower than the UMP survey results, where the total score for all 19 RIPLS items was 80.2 ± 7.2 [10]. This is because objects in UMP's 3rd and 4th academic years are prepared to study IPE according to the curriculum. Furthermore, they have a chance to exchange with other students who have experienced IPE. However, the result was greater than that of a study at the University of Medicine and Pharmacy, Hue University (HueUMP) with 1,139 students enrolled in six programs and had a total score of 68.89 ± 6.08 [11]. IPE is not now a required component module of the curriculum at HueUMP, nor is the CTUMP. Although students in our research represent 1st, 2nd academic years of ten programs, this result demonstrated that students had a positive attitude toward interprofessional collaboration and education.

The subscale mean scores for Teamwork and Collaboration and Positive Professional Identity subscales were both high in our study, with scores of 4.2 and 4.1, respectively. 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 research conducted on healthcare students [3, 12] and healthcare workers [8]. The Negative professional identity, Roles and Responsibilities subscales in our study had scores of 2.7 and 3.4 respectively. The mean score for Negative Professional Identity in our study was lower than the score reported by Ran An et al. (2024) in Jinan which involved 741 nursing students (mean score of 4.0) [12]. Overall, the scores of both these subscales were rated low, the result shows students have a high perception of the role of the healthcare team. Notably, the Role and Responsibilities subscale, students of PM rated this subscale as high with 4.1 points, considered low or less favorable attitudes. The finding was similar to that reported by Al-Shaikh et al. (2018) when students might have thought that the patient's problems should be solved within each profession [13]. In the survey, all students did not experience IPE, the results showed that the students might need more collaboration

opportunities to know the roles and responsibilities of different professions. This result might help educators strengthen the provision of knowledge on the roles, responsibilities of each profession in interprofessional collaborative practice.

The study has found no significant correlation between students' attitudes toward interprofessional learning and various factors such as age, gender, academic year. These demographic variables do not have an impact on how students perceive interprofessional collaboration and education. Notably, the analysis found a significant association between the ethnicity, profession of the student, and the score of the subscales. At the time of the survey, all students did not know IPE. They did not have an environment for teamwork to solve cases or discuss the role of professionals in the healthcare team following the instructions of teachers as the model IPE provides. The survey included 103 students in the 1st academic year who had not yet practiced in clinical. Of 198 students who studied in the 2nd academic year, the Pharmacy students have not practiced in the hospital. Students of LMT and MIT practiced in the professional department of the hospital, but they had few work chances with other professionals such as nurses, pharmacists, or midwives. Students of GM, TM, OS, PH, and PM have time in a one-module practice in clinical. Nursing and Midwifery students have more time to practice in clinicals than in other professions and they can contact patients and other healthcare workers. Their attitudes may be affected in hospital environments, where healthcare workers work as a traditional model in which nurses and other team members heavily depend on physicians. Instead of nurses, the doctors dictate the level or form of nursing care for the patients.

There are statistically significant differences in the assessed subscales among the mentioned student groups. These findings are valuable for understanding perceptions and attitudes within each group. For students with less favorable attitudes, educators should provide information on the roles and responsibilities of the healthcare team through simulations in IPE to reduce stereotypes and increase collaboration [14].

This study has several limitations. Even though all professions were surveyed, students in all academic years and a larger sample size would increase the generalizability of the study's findings. Future studies should include objects in more academic years to capture the developmental aspects of interprofessional learning attitudes throughout their education. In addition, the study could not thoroughly address other potential factors affecting students' attitudes to interprofessional learning.

V. CONCLUSIONS

Students are ready for interprofessional learning, educators need to study how to build and introduce IPE courses for them. At the same time, for students who do not have positive attitudes toward interprofessional learning, researchers could conduct targeted interviews to delve deeper. We need to a longitudinal study to track changes in student's attitudes over time. This can provide insights into the effectiveness of interventions on students' attitudes toward IPE.

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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(1), 196-7.

2. 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.
 3. 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).
 4. Knieper MJ, Bhatti JL, Dc EJT. Perceptions of chiropractic students regarding interprofessional healthcare teams. *The Journal of chiropractic education*. 2022. 36(1), 30-6.
 5. Nguyen Thi Kim Tuong. The influence of an IPE program on stereotypes of healthcare students about the role of healthcare workers. Editor: Master's thesis in Nursing. University of Pharmacy at Ho Chi Minh City. 2021.
 6. Sharma A, Minh Duc NT. A Consensus-Based Checklist for Reporting of Survey Studies (CROSS). 2021. 36(10), 3179-87. doi: 10.1007/s11606-021-06737-1.
 7. Potthoff M, Doll J, Maio A, Packard K. Measuring the impact of an online IPE course on team perceptions. *Journal of interprofessional care*. 2019, 1-4. doi: 10.1080/13561820.2019.1645647.
 8. Alruwaili A MN, Alharthy N, Othman F. Students' readiness for and perception of Interprofessional learning: a cross-sectional study. *BMC medical education*. 2020. 20(1), 390. doi: 10.1186/s12909-020-02325-9.
 9. 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.
 10. Nguyen TTK, Tran LTK, Duong KD, Tuan TD. How Vietnamese healthcare students think of nurses: Students stereotypes about Nursing at University of Medicine and Pharmacy at Ho Chi Minh City. *MedPharmRes*. 2022. 7(1), 39-46.
 11. Huyen NTT, Tam NM, Wens J, Tsakitzidis G, Van Chi L, Anh L, et al. Comparison of students' readiness from six health education programs for interprofessional learning in Vietnam: a cross-sectional study. *BMC medical education*. 2023. 23(1), 798. doi: 10.1186/s12909-023-04776-2.
 12. An R, Wang J, Li S, Li N, Yin Y, Wang X. Relationship between readiness for interprofessional learning and academic self-efficacy among nursing students: a cross-sectional study. *BMC medical education*. 2024. 24(1), 62. doi: 10.1186/s12909-023-04953-3.
 13. Al-Shaikh GK, Al-Madi EM, Masood J, Shaikh Q, Syed SB, Bader RS, et al. Interprofessional learning experiences: Exploring the perception and attitudes of Saudi Arabian medical and dental students. 2018. 40(1), S43-s8. doi: 10.1080/0142159x.2018.1465180.
 14. Kukko P S-LM, Saaranen T. Health care students' perceptions about learning of affective interpersonal communication competence in interprofessional simulations. *Nurse education today*. 2020. 94, 104565. doi: 10.1016/j.nedt.2020.104565.
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