Research article

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The impact of an interprofessional education workshop for medical, nursing, and pharmacy students: A before and after intervention study

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Abstract

Objectives

Assess the effect of the interprofessional education (IPE) workshop on students' attitudes towards interprofessional collaboration and to gather students' feedback regarding the IPE workshop in Pham Ngoc Thach University of Medicine.

Methods

A pre-post quasi-experimental design was conducted in June 2024 with third-year medical, pharmacy, and nursing students. The IPE workshop was designed with a 1-hour pre-workshop section, one 2-hour online theory session, and a 3.5-hour practice-based session with teamwork and communication skill practice, and a 3.5-hour practice-based session with standardized patients, facilitated by faculty from pharmacy, medicine, and nursing. The Interprofessional Attitudes Scale (IPAS) was used to assess students before and after the IPE on a 5-point Likert scale. Student satisfaction was measured using a 15-item questionnaire, also rated on a 5-point Likert scale.

Results

A total of 44 students (16 medical, 13 pharmacy, and 15 nursing students) completed. students' attitudes were significantly higher after completing the IPE workshop than before the program in all four sub-scale (except for the aspect "Interprofessional Biases"): "Teamwork, Roles and Responsibilities" ($z = -4.113$, $p < .001$); "Patient-centered" ($z = -3.794$, $p < .001$); "Diversity & Ethics" ($z = -3.574$, $p < .001$), "Community Centeredness" ($z = -3.467$, $p < .001$). The "Interprofessional Bias" domain remained unchanged at 3.00. Overall, 81.8% to 100% of students expressed satisfaction with the IPE activities.

Conclusion

The IPE workshop, designed and implemented to focus on the simulation of patient-centered care, positively impacted students' interprofessional attitudes. These results offer insights to expand the implementation of the IPE module in health science universities.

Keywords: Interprofessional education; Attitude; Student; Impact; Vietnam

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1. INTRODUCTION

Healthcare providers (HCPs) are increasingly required to collaborate as part of interprofessional healthcare teams to optimize healthcare quality and improve patients' satisfaction and outcomes [4]. According to the World Health Organization (WHO), Interprofessional Education (IPE) occurs when students from two or more professions learn with, from, and about

each other to effectively collaborate and enhance patient health outcomes. WHO has endorsed the importance of IPE in preparing HCPs to be competent for practice [7]. Therefore, it has been recommended that IPE be commissioned as part of health professional education at the pre-and post-registration level and implemented widely in many countries [1].

The core of IPE lies in the reinforcement of collaboration and equipping healthcare personnel with the necessary skills in the increasingly complex healthcare landscape. However, the success of IPE largely depends on the attitude and readiness of health sciences students towards this learning approach [3]. The study by Dragana Milutinovic (2018) demonstrated that students' attitudes were the most crucial factor determining the success of IPE [11]. Additionally, the attitudes of individuals from one profession can significantly influence the attitudes and behaviors of those from different professions [11].

Systematic reviews of the effects of IPE indicated that a range of IPE initiatives are being implemented and evaluated which are adding to the growth of evidence for this form of education in developed countries [5], [6], [14]. However, a limited number of studies on IPE from Asia or developing countries has been found.

In Vietnam, as a developing country, there has been an urgent requirement for the implementation of competency-based and outcome-based medical education for a few years [8], [10]. However, IPE training in universities remains so limited. In this context, Pham Ngoc Thach University of Medicine (PNTU), has developed and approved an innovative IPE module as a compulsory course for third-year students of Medicine, Pharmacy, and Nursing since the academic year 2025-2026. Therefore, this IPE workshop for students was organized in 2024 to pilot and prepare for its future application. This study aimed to assess the effect of the IPE workshop on students' attitudes towards interprofessional collaboration and to gather students' feedback regarding the IPE workshop.

2. METHODS

2.1. Study design and setting

A pre-post quasi-experimental design was adopted to determine student's attitudes before and after the IPE workshop in PNTU. PNTU was established in 1989 and has experienced significant growth with over 10 training programs in 2024.

2.2. Study population and sample

The selection criteria involved voluntary third-year students of Medicine, Pharmacy, and Nursing. Exclusion criteria included students who did not fully participate in the IPE workshop and failed to complete the pre-test and post-test assessments. The study population included 851 3rd year students (including 667 3rd year medical students, 81 3rd year pharmacy students and 103 3rd year nursing students). Convenient sampling was conducted. Students were invited to voluntarily register for participation in this IPE workshop via the IPE fanpage on Facebook, and email to students' classes. The recruitment was from April 27 to May 31, 2024.

2.3. Implementation of IPE workshop

At PNTU, a IPE core faculty group (CFG) comprising 6 members (2 from the Pharmacy Department, 2 from the Medical Department, and 2 from the Nursing Department) was established in 2022 to develop a plan and gradually implement IPE activities at the university. The CFG is further supported by a IPE core student

group (CSG) consisting of 14 senior medical and pharmacy students to execute the IPE module, which includes one sixth-year medical student, one fifth-year medical student, six fifth-year pharmacy students, and six fourth-year Pharmacy students.

The CFG co-designed teaching objectives, theoretical lecture content, teaching session structures, assessment, and the framework for the students' IPE manual with the CSG for 6 months. The SCG supported organizational tasks such as communication regarding the IPE module, registration management, group allocations, support for coordination during sessions, virtual designs of teaching materials, and provided feedback on clinical case content and assessment forms.

The IPE workshop was designed with a 1-hour pre-workshop section (named S1, organized via email sending on Day 1), one 2-hour online theory session (named S2, organized on Day 2), and a 3.5-hour practice-based session with teamwork and communication skill practice (named S3, organized on Day 3), and a 3.5-hour practice-based session with standardized patients (named S4, organized on Day 10). The description of the teaching activities of the IPE workshop is summarized in Table 1.

The learning methods included lectures, teamwork & small group discussions, case-based learning, and simulation with standardized patients. Seven small groups of 6-7 students representing all 3 disciplines had to work together to solve a clinical scenario related to a pregnant patient with gestational diabetes mellitus co-designed by the CFG and CSG. Three standardized patients worked with students. A students' IPE manual was provided for each student during the workshop.

Table 1. Students learning activities of the IPE workshop

Activity	Description	Duration
S1. Pre-workshop Section – Day 1		
Pre-test	A pre-test was sent via students' email.	
Review IPE knowledge	Watching four 15-minute videos of IPE knowledge (Introduction of IPE; Patient-center care; Teamwork; Communication skills) sent via students' email	60 mins
S1. Online meeting using MS team software – Day 2		
Question & Answers	Question & Answers about videos	30 mins
Small group allocation	Breaking a large group into 7 small groups; each group had two facilitators (one faculty member and one senior student); tasks of each small group included a self-introduction, choosing a leader and name of a team; and preparation for the next section.	60 mins
S3. Direct team working organized in a big hall – Day 3		
Teamwork	Watching videos of teamwork & discussion in a large group	20 mins
	Drawing & presenting a A0 paper for introducing each small group including name, goals, and rules of a team; 3-minute presentation for each small	40 mins
	Debriefing of teamwork	15 mins

Activity	Description	Duration
Communication skills	Introduction of a clinical case	5 mins
	Facilitators played sample roles as pharmacist-nurse conversation and physician-patient conversation using SBAR and AIDET structure	10 mins
	Each team practiced conversation using SBAR and AIDET structure	20 mins
	Two couple of students played a role pharmacist-nurse conversation and physician-patient conversation as volunteers	10 mins
	Facilitators gave feedback & debriefing	20 mins
S4. Teamwork with simulated patients organized at the simulation center – Day 10		
Discussion	Small groups discussed in a private room with two facilitators for planning of interviewing patients	20 mins
Interviewing patient	Small groups interviewed standardized patients	15 mins
Discussion	Small groups discussed in a private room with two facilitators for planning counseling patients at discharge	20 mins
Counseling patient	Small group counseled standardized patients at discharge	15 mins
Debriefing	Small group debriefing including self-reflection; peer-reflection & facilitator's feedback on individual and group performance	30 mins
Post-test	The post-test was administered directly to students during the class session	10 mins

SBAR: Situation, Background, Assessment, Recommendation; AIDET: Acknowledge, Introduction, Duration, Explanation, Thanks

Assessment Tools

The pre-test comprised two main parts: general characteristics of students (age, gender, discipline, place of birth, duration of clinical practice, number of extracurricular activities participated in, leadership experience, part-time working) and student's attitude assessment scale.

The study used the Interprofessional Attitudes Scale (IPAS) before the workshop (pre-intervention) and after completing the workshop (post-intervention) [12]. The IPAS is a scale designed to assess attitudes that relate to the 2011 Core Competencies for Interprofessional Collaborative Practice. IPAS consists of 27 items in 5 sub-scales, called "Teamwork, Roles, and Responsibilities" (9 questions), "Patient-Centeredness" (5 questions), "Interprofessional Biases" (3 questions), "Diversity & Ethics" (4 questions), and "Community-Centeredness" (6 questions). The questions in the IPAS scale are rated on a 5-point Likert scale: "1. Strongly Disagree"; "2. Disagree"; "3. Neutral"; "4. Agree"; "5. Strongly Agree". As per the survey instructions, 1 questions were reverse-scored (*1.8. It is not necessary for health sciences students to learn together*). The IPAS scale was translated from English to Vietnamese by the CFG following Beaton et al.'s guideline [2]. The study assessed the consistency of the questionnaire using Cronbach's alpha test for IPAS sub-scales. The Cronbach's alpha values for the sub-scales were as follows:

"Teamwork, Roles, and Responsibilities (0.873)"; "Patient-Centeredness (0.905)"; "Interprofessional Biases (0.748)"; "Diversity and Ethics (0.936)"; "Community-Centeredness (0.921)".

The post-test assessment consisted of the IPAS and the students' satisfaction with the IPE workshop based on Han Jung *et al.*'s scale [9].

2.4. Data analysis

The study utilized SPSS version 26.0 and Microsoft Excel 365 for data collection and analysis. Demographic variables were described in terms of counts and percentages. To evaluate the change in students' attitudes before and after the intervention using the IPAS scale, the Kolmogorov-Smirnov test was employed to assess data distribution. The p-values for all 5 dimensions were found to be less than 0.05, indicating non-normal data distribution. Therefore, the average scores for the aspects in the IPAS scale were calculated and presented as median values. Subsequently, the study analyzed the change in the average scores of the 5 dimensions in the IPAS scale using the Wilcoxon Signed-Rank Test to determine statistically significant changes when $p < 0.05$. Lastly, students' satisfaction with the IPE program was described in terms of percentages.

2.5. Ethics statement

The study was approved by the Ethics Committee of the Pham Ngoc Thach University of Medicine (Approval number 881/TĐHYKPNT-HĐĐĐ). Participants volunteered to take part in the study and were informed that all collected data would be kept confidential and used solely for scientific research.

3. RESULTS

3.1. Demographic characteristics of students

The activity attracted 95 students including 33 medical students, 32 pharmacy students, and 40 nursing students who attended the online section and completed the pre-test. However, only 44 students, including 16 medical students, 13 pharmacy students, and 15 nursing students, completed three sections of the workshop and the post-test. The dropout rate was 53,7%. The analysis was conducted with data from 44 students.

Table 2 presents the demographic characteristics of the participating students before and after the intervention. The majority of students after the intervention were ≤ 21 years old (93.2%), female (61.4%), born in Ho Chi Minh City (52.3%), with clinical internship experience of over 4 weeks (65.9%), engaged in extracurricular activities (97.7%), with team leadership experience (77.3%), and having part-time working (50.0%).

Table 2. Demographic characteristics of students

Demographic characteristics		Before intervention (n=95)	After intervention (n=44)
		Number (%)	
Age group	≤ 21 years old	85 (89.5%)	41 (93.2%)
	> 21 years old	10 (10.5%)	3 (6.8%)
Gender	Male	30 (31.6%)	17 (38.6%)
	Female	65 (68.4%)	27 (61.4%)
Discipline	Medicine	33 (34.7%)	16 (36.4%)
	Pharmacy	22 (23.2%)	13 (29.5%)
	Nursing	40 (42.1%)	15 (34.1%)

Demographic characteristics		Before intervention (n=95)	After intervention (n=44)
		Number (%)	
Place of birth	Ho Chi Minh City	47 (49.5%)	23 (52.3%)
	Other	48 (50.5%)	21 (47.7%)
Duration of Clinical Practice	No	13 (13.7%)	8 (18.2%)
	< 1 week	9 (9.5%)	5 (11.4%)
	1 to 4 weeks	3 (3.2%)	2 (4.5%)
	> 4 weeks	70 (73.7%)	29 (65.9%)
Number of Extracurricular activities	None	7 (7.4%)	1 (2.3%)
	1 to 3	30 (31.6%)	15 (34.1%)
	4 to 6	12 (12.6%)	8 (18.2%)
	> 6	46 (48.4%)	20 (45.5%)
Leadership experience	Yes	64 (67.4%)	34 (77.3%)
	No	31 (32.6%)	10 (22.7%)
Part-time working	Yes	46 (48.4%)	22 (50.0%)
	No	49 (51.6%)	22 (50.0%)

3.2 Changes in students' attitudes before and after participating in IPE workshop

The changes in students' attitudes before and after participating in the IPE workshop are presented in Table 3.

Table 3. Changes in students' attitudes before and after participating in IPE workshop

	Cronbach alpha	Before intervention (Median)	After intervention (Median)	Z	p-value
1. Teamwork, Roles, and Responsibilities	0.873	4.00	4.56	-4.113	< .001*
2. Patient-Centeredness	0.905	4.00	4.60	-3.794	< .001*
3. Interprofessional Biases	0,748	3.00	3.00	-0.735	> 0.05
4. Diversity & Ethics	0.936	4.25	4.75	-3.574	< .001*
5. Community Centeredness	0.921	4.00	4.50	-3.467	< .001*

*#Wilcoxon Signed Rank Test. *p < 0.05.*

Before participating in the IPE program, students responded positively to the program as shown by the majority of the five sub-scales in the IPAS scale having a median score of 3 or higher. Among them, the aspect of "Diversity & Ethics" had the highest median score (4.25), and "Interprofessional Biases" had the lowest median score (3.00).

In general, after participating in the program, students responded more positively about the IPE program than before participating having a median of 4.00 or higher (except for the aspect "Interprofessional Biases"). Among them, "Diversity & Ethics" had the highest median score (4.75), and "Interprofessional Biases" had the lowest median score (3.00).

The changes in 44 students' attitudes based on IPAS were analyzed using the Wilcoxon Signed-Rank Test, as presented in Table 3.

Wilcoxon Sign-Ranked statistics showed that students' attitudes were significantly higher after completing the IPE workshop than before the program in all four sub-scale (except for the aspect "Interprofessional Biases"): "Teamwork, Roles and Responsibilities" ($z = -4.113$, $p < .001$); "Patient-centered" ($z = -3.794$, $p < .001$); "Diversity & Ethics" ($z = -3.574$, $p < .001$), "Community Centeredness" ($z = -3.467$, $p < .001$).

3.3. Students' satisfaction with the IPE workshop

Descriptive statistics related to the student's satisfaction with the IPE workshop by each statement were presented in Figure 1. Accordingly, the proportion of students who "Agree" and "Strongly agree" for the 15 items assessing the level of satisfaction ranged from 81.8% - 100.0%. In which, question "A3. The duration of the program is appropriate" had the lowest percentage (81.8%). There was no case of "Disagree" or "Strongly disagree" related to students' satisfaction with the program. Students' satisfaction with the IPE workshop are presented in figure 1.

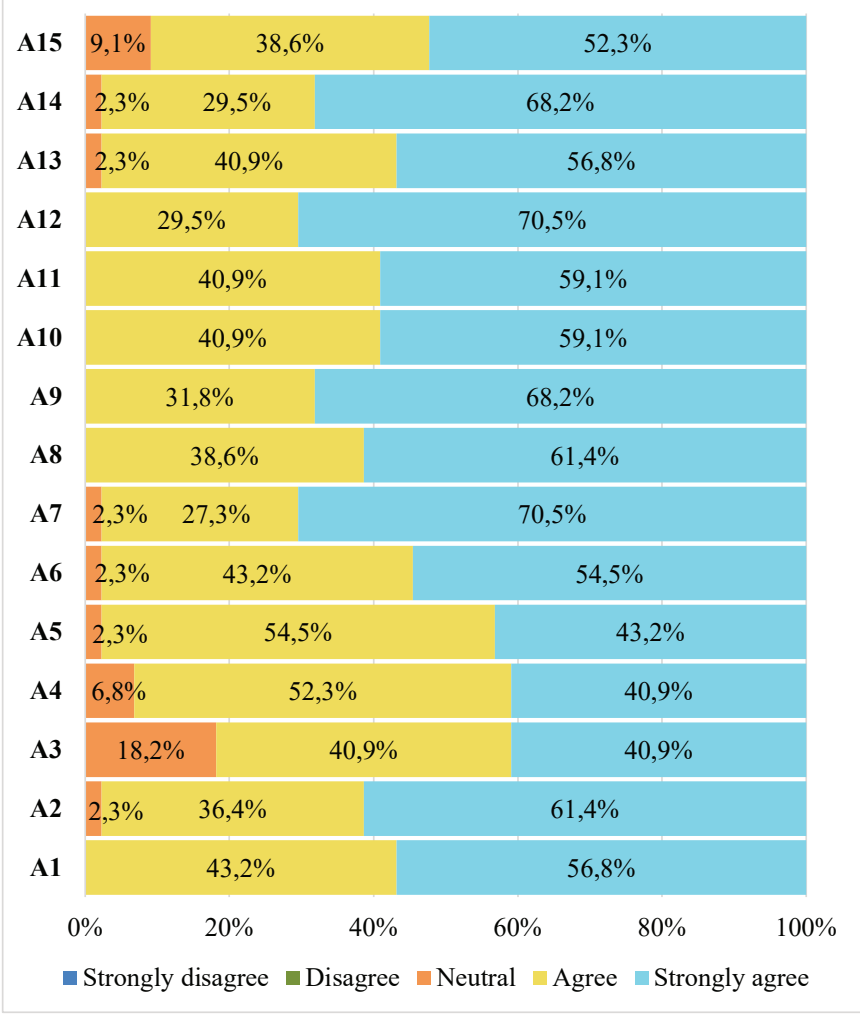

Figure 1. Students' satisfaction with the IPE workshop

A1. The purpose of the program was clearly explained to the students; A2. It was desirable to implement the program for health science students; A3. The program featured an adequate amount of running time; A4. The overall program was well designed; A5. The program objectives were achieved; A6. The role-play was an effective tool for achieving

some program objectives; A7. The program was helpful in understanding the importance of teamwork; A8. The program was helpful in understanding the value of IPE; A9. The program was helpful in understanding the roles and responsibilities of other health professionals; A10. The program was helpful for understanding the competency required for collaboration and communication among doctors, nurses, and pharmacists.; A11. The instructors played a role in promoting collaboration among healthcare students.; A12. The instructors provided useful feedback to students; Question A13. Overall, I am satisfied with the program; Question A14. This program should be provided to future students; Question A15. I will participate in other programs with similar objectives.

4. DISCUSSION

In line with CBE, the IPE workshop was designed so that students can learn, apply and practice the IPE knowledge, skills, and attitudes within the context of simulation with standardized patients. This study aimed to determine the impact of the IPE workshop on students' interprofessional attitudes. The difference in students' IPAS scores pre- and post-intervention was explored.

The dropout rate in the study was quite high (53.7%). The reasons were the workshop's hard-working learning schedule with 4 sections, 10 hours of learning, and 10 days; the time of workshop organization was at the same time as students' examination or clinical internship; and lacking students' previous experience of IPE. The high rate of drop out also encountered in other studies (19.3%-37.3%) [13], [15].

The IPAS tool was chosen because it was developed with input from health professional students, including pharmacy students. The IPAS is best used to assess student's readiness to engage in interprofessional activities and should be used early in the IPE implementation process, which was consistent with the objectives of the workshop. The Cronbach's alpha value for the entire IPAS sub-scales was "very good" with above 0,7. The results are consistent with the study by Deborah Doherty et al [15] and indicate that the IPAS scale may be suitable for implementation in Vietnam.

The finding showed statistically significant improvements in students' attitudes, as measured by the IPAS five sub-scales score. Working in a stable interprofessional student team throughout the workshop, students had an experience of collaborating with other professionals on different tasks. This has been designed and implemented in the flowing learning activities, including team building, group discussion on a clinical case, and practice in simulation with standardized patients. That made students experience a step-by-step approach which promoted students' motivation and attitudes for interprofessional collaboration. Similar results were found in several studies that students' interprofessional attitudes could be enhanced by IPE [9], [15]. The high rate of student satisfaction with the IPE workshop was similar to other study [9], which also approved students' positive attitudes toward IPE. These results added positive evidence to the other [13] which will support the development of IPE in healthcare universities in Vietnam.

The strengths of this study include the rigorous learning methods of the IPE workshop, especially simulation with standardized patients to enhance the spirit of patient-centered care. The application of pre-recorded videos of IPE knowledge helped to save human resources. Secondly, the study translated and assessed the consistency of

the questionnaire using Cronbach's alpha test for the IPAS scale before use. This study is not without limitations. The voluntary participating students, high dropout rate, and small sample size may influence the results. The small sample size accounted for only 11.2% of the study population. Students who voluntarily registered to participate might be those with higher motivation and better interdisciplinary collaboration skills. The dropout rate was high (53.7%), with the main reasons including the workshop spanning multiple sessions, scheduling conflicts with exam periods, students perceiving the workshop as not useful, and personal commitments. This suggests that the study results tend to reflect positive outcomes of the intervention on a non-representative sample of the population. However, the findings of this study still hold certain value.

5. CONCLUSION

The IPE workshop, designed and implemented to focus on the simulation of patient-centered care, positively impacted students' interprofessional attitudes. These results offer insights to expand the implementation of the compulsory IPE module to medicine, pharmacy, and nursing educational programs as planned.

6. REFERENCE

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