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# Interprofessional Education Learning Evaluation: Based on Core Competencies Interprofessional Education Collaborative

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**ABSTRACT**

**Background:** The Interprofessional Education (IPE) Collaboration emphasizes 4 core crucial for effective collaboration in health services. The four core competencies included values and ethics, roles and responsibilities, communication, teams, and collaboration.

**Objectives:** This study aimed to evaluate the results of IPE learning at Tanjungpura University based on IPEC core competencies.

**Methods:** A cross-sectional design was adopted, and data were collected through an online survey. The respondents comprised undergraduate students at the Faculty of Medicine at Tanjungpura University who had participated in IPE and were willing to fill out the questionnaire. Data were analyzedwith Jamovi software version 2.6.19 for descriptive and statistical analysis. The study examined the correlation of age, gender, and study program with IPE Core Competency statement.

**Results:** A total of 101 respondents completed the survey, consisting of 80.20% females and 19.80% males, with an average age of 21.2 years. These respondents were enrolled in study programs of Pharmacy (85.15%), Medicine (8.9%), and Nursing (5.94%). No significant correlations were found between age and gender with understanding of IPE Core Competencies (p-value > 0.05). However a correlation was observed between study programs and understanding of IPE Core Competencies statement "I had the opportunity to learn what interprofessional relationships are like" (p value <0.05), linked to roles and responsibilities

**Conclusion:** IPE participation helps students achieve the four Core Competencies. Understanding of thsese competencies was not influenced by age or gender, but was related to study program, particularly in the core competencies of roles and responsibilities.

**Keywords: Interprofessional education; Learning evaluation; Medical student; Nursing student; Pharmacy student**

## INTRODUCTION

The Interprofessional Education Collaboration is a partnership organization established in 2009 that promotes team-based learning activities between health workers.[1] According to the World Health Organization (WHO), Interprofessional Education is an experience that occurs when students from two or more health professions learn about each other.[2] Interprofessional Education (IPE) is the basis for the implementation of the practices among health workers. This partnership continues to evolve, resulting in the development of four core competencies by 2023 that are essential for collaborative practices in health services. The four core competencies include values and ethics, roles and responsibilities, communication, teams and collaboration.[1]

The health and education sectors need to work together and coordinate in making policies related to interprofessional education.[2] Studies on the impact of interprofessional education on students show an increase in socialization skills in teamwork, influence collaboration in clinical practice, increase the readiness to work in teams, and also develop skills and a sense of belonging in health services. [3–5] Quantitative valuation of IPE has

been conducted using questionnaires, such as the Interdisciplinary Education Perception Scale (IEPS) [6], Interprofessional Collaborator Assessment Rubric (ICAR)[7], and self-administered questionnaires.[8]

The Faculty of Medicine, Tanjungpura University, offered its inaugural IPE course in 2024 and consequently had not previously conducted an evaluation. IPE participants in the medical and nursing study programs were selected. Lectures were conducted simultaneously because of the block lecture system. However, IPE lectures in pharmacy were conducted separately but attended by all students from the pharmacy, medical, and nursing study programs. This happened because the curriculum system in the pharmacy study program was semester-based. The three study programs received materials and practices from the same references [1], enabling an equal evaluation process. As an educational institution that wants to continue developing learning outcomes, analysts want to evaluate the IPE learning that has been performed. In this study, a previously developed and validated IPE Competency-based questionnaire was adopted. [9]

IPE has many positive impacts on the results of its implementation. Previous studies have shown that the results after the implementation of IPE are increased communication skills of students between health professions[10,11], as well as high understanding of the roles and responsibilities between health professions. [10,12] A key benefit of IPE is its potential to prevent patient handling errors and enhance patient safety.[10,11] Chen et.al., compared the implementation of IPE with conventional learning of health professions, and the results were not significantly different from theoretical expectations.IPE provided opportunities for health students to be exposed to each other and get to know various skills and responsibilities. [13] Therefore, this study aimed to evaluate core competency-based IPE learning. This study was motivated by the lack of a core competency-based evaluation for interprofessional education learning outcomes.

## METHODS

### Study design

A cross-sectional design was adopted, and data were collected through an online survey. The statements in the questionnaire came from previous studies that had been validated and had received permission from the questionnaire owner.[9]

### Population and samples

The respondents of this study were undergraduate students in medical, pharmacy, and nursing study programs, Faculty of Medicine, Tanjungpura University, in 2024. These respondents were selected using total sampling, as the students were included based on the experience acquired while participating in Interprofessional Education. The inclusion criteria were students who had completed Interprofessional Education lectures and were willing to participate.

### Study instruments

This study used the Interprofessional Education Core Competency questionnaire developed and validated by Zaccomer et al., [9] after obtaining permission. The questionnaire contains 10 statements for developing 4 Interprofessional Education Core Competencies, namely values and ethics, roles and responsibilities, communication, team and collaboration. Statements 1-2 were related to professional values and ethics, while 3-6 were based on roles and responsibilities. Similarly, statements 7-8 were related to communication skills, while 9-10 were based on teamwork and collaboration, as shown in Table 2. The questionnaire provided answer choices with a Likert scale of 1-5, representing strongly disagree, disagree, doubtful, agree, and strongly agree, respectively.

### Data collection

Data were collected by distributing an online questionnaire related to respondents in January-February 2025. The questionnaire begins with an introduction, stating the purpose of the study, followed by informed consent before the respondents answer the questions. These questionnaires were distributed through groups on the WhatsApp application and personal contacts. All contacts were obtained through the IPE teaching team at the medical faculty.

### Data Analysis

The questionnaire filled out by the respondents was processed for descriptive and statistical analysis, using Jamovi software version 2.6.19. The statistical analysis included the test for normality using the Shapiro-

Wilk test, followed by an assessment of the relationship between variables. Furthermore, the independent variables included age, gender, and study program, while the dependent variables were 10 IPE Core Competency statements. The statistical tests conducted were Mann-Whitney, Spearman Rank, and Kruskal-Wallis, with a significance level set at p-value < 0.05. The Spearman Rank test was conducted to determine the relationship between age and IPE Core Competencies. The Mann-Whitney test was used to determine the relationship between gender and IPE Core Competencies, while Kruskal-Wallis examined the correlation between Study Program and IPE Core Competencies.

## RESULTS AND DISCUSSION

### Sociodemographic

The number of respondents willing to fill out the questionnaire was 101 out of 118, with a response rate of 85.59%. These respondents consisted of 80.20% females and 19.80% males, with an average age of 21.2 years from the Pharmacy (85.15%), Medicine (8.9%), and Nursing (5.94%) study programs, as shown in Table 2.

**Table I. Demographic Characteristics of Respondents**

| Characteristics | Data | Number | Percentage (%) |
|---|---|---|---|
| **Gender (people)** | Female | 81 | 80.20 |
| | Male | 20 | 19.80 |
| **Age (year)** | Average age | 21.2 | |
| | Minimum age | 17 | |
| | Maximum age | 22 | |
| **Study Program (people)** | Pharmacy | 86 | 85.15 |
| | Medicine | 9 | 8.91 |
| | Nursing | 6 | 5.94 |

### Descriptive Analysis

The IPE learning evaluation questionnaire was developed based on IPEC core competencies and validated by previous studies. [9] The questionnaire consisted of 10 statements that elaborated on the four cores of IPE, namely values and ethics, roles and responsibilities, communication, team and cooperation. Table 2 shows the results of the descriptive analysis of 101 respondents who filled out the questionnaire. The data showed an average value of 4.42, 4.39, 4.46, 4.47, 4.54, 4.51, 4.29, 4.44, 4.49, and 4.51 for statements 1 to 10, respectively. The standard deviation was less than 1 in all results, suggesting that the average value could represent the entire data. From the average results, most respondents agreed with the statement regarding the abilities obtained related to the four competencies after participating in IPE learning.[10]

**Table II. Descriptive Statistics Results of Core Competencies of IPE**

| No. | Statement related to IPE Core Competency | Number of Respondents | Average | Standard Deviation | Max. Value | Min. Value |
|---|---|---|---|---|---|---|
| **1.** | After studying IPE, I can build trusting relationships with other professionals to support and realize health services. | 101 | 4.42 | 0.604 | 5 | 3 |
| **2.** | After studying IPE, I can contribute to patient placement as a focus of treatment in health facilities. | 101 | 4.39 | 0.583 | 5 | 3 |
| **3.** | After studying IPE, I can use the unique skills of each health profession to provide safe, timely, efficient, and intensive services. | 101 | 4.46 | 0.575 | 5 | 3 |
| **4.** | After studying IPE, I can build interconnected relationships with other health professionals. | 101 | 4.47 | 0.657 | 5 | 2 |
| **5.** | I had the opportunity to learn what interprofessional relationships are like. | 101 | 4.54 | 0.609 | 5 | 3 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **6.** | After studying IPE, I can understand how the roles of other professionals complement each other in providing person-centered health services. | 101 | 4.51 | 0.594 | 5 | 3 |
| **7.** | After studying IPE, I can communicate with other health workers to facilitate collaborative decision-making. | 101 | 4.29 | 0.668 | 5 | 3 |
| **8.** | After studying IPE, I can discuss with other health workers involved in patient care with confidence, courtesy, and mutual respect. | 101 | 4.44 | 0.623 | 5 | 2 |
| **9.** | After studying IPE, I can involve other health professionals in patient-centered care to optimize treatment. | 101 | 4.49 | 0.594 | 5 | 3 |
| **10.** | After studying IPE, I can use strategies to improve teamwork efficiency and team-based care. | 101 | 4.51 | 0.576 | 5 | 3 |

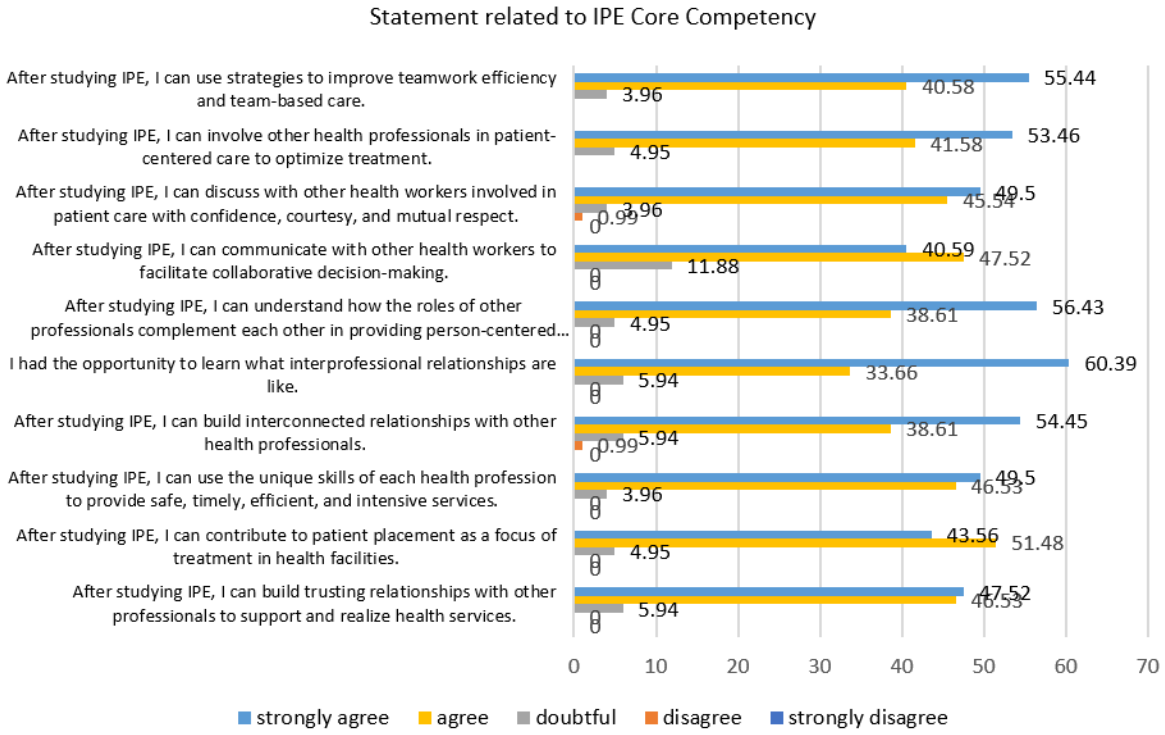


**Figure 1. The Result of The Questionnaire**

The majority of medical students agreed that studying Interprofessional Education (IPE) enabled leveraging the unique expertise of each health profession to deliver safe, timely, efficient, and intensive services (n = 96.03%, agree and strongly agree combined). Furthermore, most students agreed that studying IPE facilitated implementation of strategies to enhance efficient collaboration (n = 96.02%, agree and strongly agree). High levels of agreement were observed after studying IPE, with recognition of the patient as the primary focus of treatment, health profession roles complemented one another in healthcare facilities, collaboration with health workers improves patient care, and confident, respectful discussion with other health professions was possible (n = 95.04%, agree and strongly agree combined). Building trust with other health professionals and understanding interprofessional relationships also received high agreement (n = 94.05%, agree and strongly agree combined). Connection with various health professions received high agreement as well (n = 93.06%, agree and strongly agree). The statement with the lowest agreement value pertained to communication with various health professions for decision-making (n = 88.11%, agree and strongly agree combined).

**Table IV. Relationship between Age and Core Competencies of IPE; Gender and Core Competencies of IPE; Study Program and Core Competencies of IPE**

| Statistic test | After studying IPE, I can build trusting relationships with other professionals to support and realize health services. | After studying IPE, I can contribute to patient placement as a focus of treatment in health facilities. | After studying IPE, I can use the unique skills of each health profession to provide safe, timely, efficient, and intensive services. | After studying IPE, I can build interconnected relationships with other health professionals. | I had the opportunity to learn what interprofessional relationships are like. | After studying IPE, I can understand how other professionals' roles complement each other in providing person-centered health services. | After studying IPE, I can communicate with other health workers to facilitate collaborative decision-making. | After studying IPE, I can discuss with other health workers involved in patient care with confidence, courtesy, and mutual respect. | After studying IPE, I can involve other health professionals in patient-centered care to optimize treatment. | After studying IPE, I can use strategies to improve teamwork efficiency and team-based care. |
|---|---|---|---|---|---|---|---|---|---|---|
| **Spearman Rho** | -0.092 | -0.026 | -0.157 | -0.026 | 0.038 | 0.030 | -0.030 | -0.079 | -0.139 | -0.065 |
| **P-value** | 0.361 | 0.793 | 0.117 | 0.794 | 0.707 | 0.767 | 0.768 | 0.432 | 0.167 | 0.519 |
| **Mann-Whitney Test** P-value | 0.693 | 0.388 | 0.100 | 0.556 | 0.789 | 0.744 | 0.306 | 0.613 | 0.287 | 0.943 |
| **Kruskal Wallis Test** P-value | 0.409 | 0.452 | 0.566 | 0.097 | **0.004** | 0.068 | 0.478 | 0.865 | 0.965 | 0.583 |

However, this value remained high, with more than half of the respondents in agreement. Based on the questionnaire results, students had a good perception of the core competencies of IPE, in terms of the four core competencies. Previous studies on IPE in Indonesia showed a good perception with a percentage of 75.5%.[6] A survey conducted by Soubra et.al also showed that students agreed that IPE positively impacted understanding the role of interprofessional health. [14]

### The Correlat vion between Variables

A normality test was conducted on 101 respondents using the Shapiro-Wilk test to determine whether the data were normally distributed. The normality test results showed the data distribution was not normal because the p-value was less than the tabulated value, which was 0.001 <0.05. Therefore, a follow-up test was carried out using a non-parametric method. The results of the Spearman Rank test showed a very weak correlation, and there was no significant relationship between the age of the respondents (p-value> 0.05) on the understanding of IPE core competencies. All respondents between 17 and 22 years old could understand the IPE core competencies given during lectures. Individual understanding or intelligence peaked at 16 [15], ensuring that all respondents are at the same level. Other studies also reported that there was no relationship between age diversity and the ability to receive material or learning outcomes.[16]

The Mann-Whitney test showed no relationship between gender and the ability to understand IPE core competencies (p-value > 0.05). In this study, the number of female respondents (80.20%) was more dominant than that of male respondents (19.80%), which could be a driving factor. The results of this statistical test were consistent with previous reports that gender did not determine respondents' attitudes toward IPE[17]. This was also similar to the report of studies in other fields that gender, learning style, and learning outcomes had no direct correlation.[18] Although different studies reported a more significant positive attitude towards IPE among female students, [19] this difference is not attributed to gender-based understanding. Gender differences have been found to influence learning style preferences, with men often favoring kinesthetic learning and women tend to prefer aural learning.[20] Therefore, these results could be used as material for further studies to determine which learning style was more appropriate for improving the IPE understanding of students.

The Kruskal-Wallis test results in Table VI showed no significant correlation between study programs and respondents' understanding of IPE core competencies in 9 out of 10 statements. A statement that correlated with IPE core competencies and study programs (p-value <0.05) was "I got the opportunity to learn how interprofessional relationships are." This statement was included in the core competencies of the roles and responsibilities of IPE. Studying IPE provided students with an opportunity to better understand the roles and responsibilities of other health professions.[10,14] As students from all study programs were first-time IPE learners, these factors may contribute to the correlation between study program and the statement. However, the lack of correlation between the other 9 statements and the study program does not imply that students lack understanding. This suggests that the study program does not influence students' comprehension of IPE core competencies. Previous studies have consistently shown that investigating IPE leads to improved student abilities in communication, collaboration, and understanding the roles and responsibilities of other professions, regardless of study program.[6,2112,22]

## CONCLUSION

In conclusion, students of the Faculty of Medicine, Tanjungpura University, have a good perception of IPE core competencies after participating in IPE learning. The result shows that age and gender do not correlate with students' understanding of IPE Core Competencies. However, there is a correlation with the Study Program, especially in the core competencies of roles and responsibilities.

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## STATEMENT OF ETHICS

This study has passed the ethical review of the Ethics Committee of the Faculty of Medicine, Tanjungpura University, on January 22, 2025, with number 701/ UN22.9/PT.01.04/2025.

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