

Students' Perception and Readiness Level Toward Interprofessional Education (IPE) Before and After Program Implementation

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Abstract

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Background: The changing health system and the large number of patients presenting with chronic diseases require multi-disciplinary care. For this reason, Interprofessional Education (IPE) needs to be conducted to train teamwork between these health workers. Furthermore, to develop the IPE program at the faculty, it is necessary to have a good evaluation. In Kirkpatrick's evaluation model, an assessment of student perceptions and readiness can be carried out to evaluate IPE implementation. Therefore, the differences in perceptions and readiness at the beginning and after IPE implementation need to be carried out to assess the program. **Objective:** The purpose of this study is to find out the overview and comparison of perception and readiness level before and after the implementation of IPE. **Methods:** This research was a comparative quantitative study with a pre-experimental one-group pretest-posttest design with data collection using questionnaires. The type of data used in this study was primary data using Student Perception of Physician and Pharmacist Interprofessional Clinical Education (SPICE) and the Readiness for Interprofessional Learning Scale (RIPLS) questionnaires. 81 final semester academic students of the pharmacy and medical study program were collected to measure their level of perception and readiness for IPE before and after the implementation of IPE. The data were analyzed using the SPSS computer program. **Result:** Perception result before IPE was 4.29 (scale 1-5) and 4.49 after IPE. As for the results of readiness, 4.15 before IPE and 4.29 after IPE. There was a significant increase in students' perceptions and readiness after the implementation of IPE ($P < 0.005$). **Conclusion:** Most students have a good perception and readiness for IPE and there is a significant increase after IPE.

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BACKGROUND

Along with the changes in the health system and the number of patients who come with chronic diseases, health care is needed with multidisciplinary care.^{1,2} In several studies, the level of effectiveness of health care has increased significantly with the handling of health teams consisting of various disciplines. The existence of a team from various disciplines also affects clinical effectiveness, job satisfaction, service delivery, medical team compliance with

clinical guidelines, patient satisfaction, and reduction of medical errors and treatment costs.^{3,4,5}

On the contrary, poor collaboration and communication between professions affect the quality of service, increases the risk of infection, patient falls, diagnostic and treatment errors, discontinuation of care which will ultimately reduce patient satisfaction. Thus, it affects the increasing burden on doctors and other medical personnel due to the inefficient use of human resources.^{6,7}

In Indonesia, the cooperation among healthcare professionals is still low. It happens due to a lack of understanding of patient-centered care, the lack of face-to-face interaction, unequal decision-making, and misconceptions about the roles and responsibilities.⁸ Hence, it is necessary to develop the competence of Indonesian health workers, especially in terms of collaboration, collaboration, and communication.

Interprofessional education (IPE) is a learning process that can collaborate with a variety of healthcare professionals to provide optimal care to patients. IPE provides some positive impact and effectiveness in various health disciplines, ranging from financing, improving services, and medical error reduction.^{4,9,10} Nevertheless, the implementation of IPE in the education system in Indonesia is still not good. Some of the latest evidence of IPE implementation comes from developed countries. The fact is inversely related to the application of the IPE is still rarely comes from developing countries like Indonesia.¹¹ Several medical faculties in developing countries have implemented IPE in their educational curriculum, but it has not been implemented properly.¹²

To develop the IPE program at the faculty, it is necessary to conduct a good evaluation. Kirkpatrick's (1956) evaluation model which is later developed by Freeth (2002), explains that there are four levels in evaluation, namely: (1) Reaction, (2a) Perception and readiness, (2b) Knowledge and skills, (3) Behavior change, (4a) Organizational change, and (4b) Benefits to patients.¹³ The perception and readiness for IPE are components of level 2a evaluation in the Kirkpatrick model. Evaluation of this component is important in the implementation of IPE, both the perceptions of faculty, lecturers, and students.^{14,15}

Since 2019, the Faculty of Medicine and Health Sciences of UIN Maulana Malik Ibrahim Malang has been holding the IPE program as one of its learning models. This activity was participated by all final

semester academic students (7th semester) in pharmacy and medicine. The activity begins with determining and selecting one patient who meets certain criteria. Then the patient will be identified the disease through interviews. For the next step, they make further plans in accordance with their respective professions.

Currently, there are no studies that evaluate the perception and readiness of students in evaluating the IPE program in the Faculty of Medicine and Health Sciences UIN Maulana Malik Ibrahim Malang. Therefore, researchers want to conduct a study to evaluate the perception and readiness of students in implementing IPE by comparing before and after the implementation of the IPE.

Several similar studies have been conducted in several medical faculties in Indonesia. Such as research conducted by Febriana (2019)¹⁶, Safitri (2017)¹⁷, A`la (2012)¹⁸. However, there has been no research that has assessed students' perceptions and readiness to use SPICE and RIPLS instruments simultaneously.

The purpose of this study is to describe the perception and readiness of students towards IPE and to find out the comparison before and after the implementation of the IPE program.

METHOD

This research was a comparative quantitative study with a pre-experimental one-group pretest-posttest design with data collection using an online questionnaires. The instruments used were Student Perception of Physician and Pharmacist Interprofessional Clinical Education (SPICE) and the Readiness for Interprofessional Learning Scale (RIPLS).

This research was carried out from October 2020 to May 2021, at the Faculty of Medicine and Health Sciences (FKIK) of UIN Maulana Malik Ibrahim Malang. The samples were all students of pharmacy and medicine in the final stage of academic (7th semester). The inclusion criteria of this

study were 7th semester academic students from medicine and pharmacy who are currently or have implemented the IPE program in 2020 and are willing to become research subjects. The exclusion criteria of this study were students who were not willing to be research subjects, filled out the questionnaire twice (double), and the questionnaire was filled out incompletely.

The total sample used is 124 students. However, only 87 students were willing to fill out the questionnaire. Of the 87 data, there are duplicate data as many as 6 respondents, causing only 81 respondent data to be used so that the usable response rate in this research is 65.3%.

Before the activity began, students were given some materials about IPE for 6 meetings. After that, students were given questionnaires to assess their perception and readiness before the IPE activity. Students were divided into several group, one group consists of 3 students and 1 supervisor. Each group was determined by one patient whose disease will be identified and further intervention will be carried out. Then all group members interviewed patients through online media to explore their disease history and existing problems. After that, they discussed planning their intervention based on the views of each profession. The plan is transformed into a product in the form of a poster/pamphlet/video or other media and then presented to the patient. After the activity ended, they were given questionnaires to reassess their perception and readiness. Filling out the questionnaire was done online and was done independently without any assistance.

Research Instruments

SPICE is an instrument used to measure students' perceptions of IPE, especially for medical and pharmacy students. SPICE contains 10 items and 3 factors which include: (1) interprofessional teamwork and team-based practice (items 1, 5, 6, & 8-10), (2) roles/responsibilities in collaborative practice (items 2 & 7), and (3) patient care outcomes from collaborative practice (items

3 & 4). This instrument was taken from the research of Hapsari (2019), where the instrument was translated from English into Indonesian by some expert in clinical education, then a reliability test was conducted with a cronbach alpha value of 0.72.¹⁹

RIPLS is an instrument that is often used to measure students' readiness or beliefs about IPE. This instrument was developed by Parsell and Bligh to support students in assessing various aspects of IPE. This questionnaires consisted of 19 items covering four subscales, namely: teamwork and collaboration, negative professional identity, positive professional identity, and roles and responsibilities. This study used Indonesian version which has been tested for construct validity by Kusuma (2020) and reliability test was conducted with a cronbach alpha value of 0.894.²⁰

Result analysis

This study used the SPSS 25 program. In analyzing descriptive statistics, the researcher used univariate analysis. As for the processing of analytical statistical data, this study uses a comparative test. The normality test was carried out using the *Shapiro-Wilk* test and showed an abnormal distribution ($P < 0.05$) so that the researchers used the *Wilcoxon* test for the comparative test in this study.

RESEARCH RESULT

A total of 81 students filled the questionnaires with a response rate of 65.3%. The number of male respondents was as many as 16 people (19.8%) and women as many as 65 people (80.2%). This distribution was directly proportional to the total population, where the female population is 93 students (75%) and the male student population is 31 students 25%. It means that 52% of male students and 70% of female students have filled out the questionnaires.

As for the comparison of the distribution of respondents between a major,

from medical study programs as many as 38 people (46.9%) and pharmaceutical study programs as many as 43 (53.1%). When compared to the population, about 82% of

medical students had filled out the questionnaires and 55.1% of pharmacy students.

Table 1. The description of students' preceptions

	Total		Male		Female		Medical		Pharmacy	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Teamwork	4,33	4,52	4,19	4,36	4,37	4,55	4,22	4,30	4,44	4,71
Roles/responsibilities	3,95	4,23	3,5	4,00	4,07	4,29	3,76	4,00	4,14	4,45
Patient care outcomes	4,44	4,65	4,34	4,56	4,46	4,68	4,3	4,49	4,57	4,81
Total	4,29	4,49	4,08	4,33	4,3	4,53	4,09	4,28	4,38	4,68

The table 1 is a description of students' perceptions before and after the IPE program. From the table, the average total student perception score before the program was 4.29 while after the program was 4.49. From these results, there is an increase in the average after the implementation of the IPE, both for men, women, students of medical education, and pharmacy. Factors relate to patient outcomes showed the highest score with a score of 4.44 -4.65, followed by teamwork and team-based practice factors (4.22 - 4.52) and roles/ responsibilities (3.95

- 4.23). All factors also showed an increase in the post-IPE implementation.

Male students showed lower perception results (4.08 - 4.33) than female students (4.30 -4.53) both before and after IPE implementation and covered all factors. Meanwhile, medical education students also showed lower perception results (4.09 - 4.28) than pharmacy students (4.38 - 4.68), both before and after the implementation of IPE, and covered all factors.

The description of student readiness based on the sub-scales in the RIPLS instrument can be seen in table 2:

Table 2. Overview of student readiness

	Total		Male		Female		Medical		Pharmacy	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Teamwork and collaboration	4,30	4,43	4,24	4,43	4,31	4,43	4,21	4,24	4,38	4,60
Positive professional identity	4,19	4,22	4,05	4,14	4,22	4,33	3,98	4,03	4,37	4,55
Negative professional identity	3,72	3,80	3,67	3,71	3,73	3,98	3,61	3,54	3,81	4,32
Roles and responsibilities	4,1	4,14	4,07	4,09	4,18	4,24	4,03	4,02	4,17	4,40
Total	4,15	4,29	4,09	4,20	4,17	4,31	4,01	4,06	4,26	4,53

From the table 2, the average score of student readiness before the program was 4.15. Then, there was an increase to 4.29 after the program. More specifically, an increase in scores was also seen in each group, both male, female, medical and pharmacy students.

The teamwork and collaboration-related sub-scale showed the highest score with a score of 4.30 - 4.43, followed by the positive professional identity sub-scale (4.19 - 4.22),

the roles and responsibilities sub-scale (4,1 - 4 .14), and finally the negative professional identity sub-scale (3.72 - 3.80). All subscales showed an increase after the implementation of the IPE, except for the male group in the negative professional identity subscale and the roles and responsibilities subscale.

As in the perception assessment, the readiness of male students also showed lower results (4.09 - 4.20) than female

students (4.17 -4.31) both before and after IPE implementation. Meanwhile, medical education students also showed lower perception results (4.01-4.06) than pharmacy students (4.26-4.53), both before and after the IPE implementation.

The results of the comparison test can be seen in table 3. From the table, it concluded that in the comparison of perceptions, all factors showed significant

differences between before and after the implementation of IPE ($P < 0.05$). As for readiness, overall there was a significant difference between before and after IPE implementation. However, the positive and negative professional identity sub-scale and the responsibility factor did not experience a significant increase.

Table 3. Comparative Test Results

	Factor/Sub-scale	Sig.	Conclusion
Perception	Teamwork	0,001	Significant
	Roles/responsibilities	0,000	Significant
	Patient care outcomes	0,009	Significant
	Total	0,000	Significant
Readiness	Teamwork and collaboration	0,035	Significant
	Positive professional identity	0,152	Not Significant
	Negative professional identity	0,203	Not Significant
	Roles and responsibilities	0,198	Not significant
	Total	0,014	Significant

DISCUSSION

Before the implementation of IPE, the majority of students already have a good perception of IPE. This result is constant after the implementation of IPE. Several factors that can influence this perception result include: cognitive ability, culture, major, GPA, intrinsic motivation, organizational experience, educational and institutional background, degree held, length of work, teaching approach, and infrastructure provided by faculty and lecturers.²¹ Teaching approach could be a major factor in the results of this study. The briefing during six meetings at the beginning of the program may have a major impact on the results. In this briefing session, pharmacy and medical students were gathered in one class to be given directions on IPE, communication, the responsibilities of each profession, and so on. This briefing allowed students to know the description and objectives of the program they were going to undertake.

Table 1 showed that the patient care outcome factor showed a high average perception, followed by the teamwork and team-based practice factor, and finally the role and responsibility factor. Patient care outcomes factors show a high number of students indicate that they strongly agree that patient care outcomes will improve if it is handled by a variety of professionals from several disciplines. It is in line with previous studies where a good IPE can reduce the patient's risk of falls, diagnostic errors, medication, and surgical errors to increase patient satisfaction.^{4,9,10} This result was different from the research conducted by Brock, et al (2020)²², Brennan et al (2021)²³ and Zorek et al (2014)²⁴ who stated that the teamwork and team-based practice factor had the highest average, followed by patient outcomes and roles and responsibilities. This happens because IPE has been carried out at the beginning of the academic year, so there is strong cooperation between team members at the end.

The role and responsibility factors that are still low indicate that students still do not fully understand their role in the professional world. The minimal experience of academical students may be the main factor in this result.²⁵ Supervisors can assign different tasks between professions to deal with these factors, resulting in different roles and responsibilities of students. In addition, 2 supervisors from each profession can be involved in each group.

In terms of readiness, the majority of students have good readiness for IPE before and after the implementation of IPE. In this study, the teamwork and collaboration subscale showed the highest average readiness, followed by the positive professional identity subscale, roles and responsibilities, and the negative professional identity subscale. The teamwork and collaboration sub-scale that scores the highest assumes that students are ready to collaborate between professions in improving treatment outcomes. This is in line with IPE's core competence which states that students must be able to work in teams effectively in planning, conducting, and evaluating treatments.

The negative professional identity which was the lowest sub-scale among other factors showed that there is still a sense of egoism to work alone without help from other professions. However, this result is still moderate and shows that most of the students consider that other professions in work are equally important.

This finding was different from research conducted by Alzamil (2020), and Yuniawan et al (2015), where the role and responsibility factors ranked the lowest in student readiness.^{26,27} Mahler (2015) mentions that the "role and responsibility" factor is unstable and unsatisfactory which forced some researchers to ignore this scale in their data analysis. In this study, the role and responsibility factor also ranked second lowest. In overcoming the low value of role and responsibility and professional identity, simulations can be carried out before going

directly to the patient so that students can better know their respective roles.

The overall perception and readiness of pharmacy students have a higher average than medical students. It shows the same result with the research conducted by Syahrizal, et al (2020)²⁸, El-Awaisi, et al (2018)²⁹, and A`la (2012).²² Medical students tend to be more skeptical and perceive IPE as less important.¹⁴ Medical students feel they have more knowledge and skills than other professions. This perception then leads to their lack of enthusiasm and not being ready to implement IPE.²² One of the factors just as medical students high academic load causes them to prioritize other subjects than the IPE.

In the gender comparison, female students have better perceptions and readiness than males. The same results are also stated by Yune, et al (2020)¹⁴, Talwarkar et al (2016)³⁰ and Zeeni, et al (2016).³¹ Female students are more likely to work in teams rather than males, they are also more able to understand the views of other people. So they are better prepared to learn new things.^{16,32} The ambition of female students to make them have an equal position with male students in the world of work and differences in learning styles may also be a factor.¹⁶ The results of this study may also be influenced by different numbers of samples, the number of male respondents was as many as 16 people (19.8%) and women as many as 65 people (80.2%).

It has been mentioned that there is a significant increase in perception between before and after IPE implementation. Students are assigned to solve problems with their respective capacities and roles according to their fields. These small groups are effective for building relationships between students to exchange ideas, share assignments, and work together. This finding is similar to research conducted by Setyo (2018)³³, Guinan (2018)³⁴, Zanotti (2015)³², and several other researchers. Most studies find positive perceptions of students. The researchers reported positive changes in students' perceptions of each factor, both in

terms of teamwork, roles and responsibilities, as well as patient outcomes. In the setting of these studies, students were not given a briefing before filling out the questionnaire, so that the perception results were low before the program and there was a significant increase after the program.

Student readiness also increases after the implementation of IPE. However, the positive and negative professional identity factors and the responsibility factor do not show a significant increase. Teamwork and collaboration factors have a big influence on the overall comparison test results because in that factor there were 9 out of 19 question items. So that the overall comparison test showed significant results even though the other three factors showed no significant results.

Research on differences in readiness before and after IPE often gives different results. McFayden et al. (2010) in Groess (2019) found that interprofessional learning readiness is positive initially and then decreased after IPE.³⁵ A similar study conducted by Fuadah (2014) shows improvement of readiness after applying IPE.³⁶ According to him, the readiness that is already high before the implementation of the IPE may cause no significant increases after the implementation of the IPE.³⁷

Limitation

Several limitations of this study were the study only examined the perception and readiness, which did not describe the effectiveness of the overall program. Additionally, samples can be collected only 65.3% of the total population. This amount can be increased to improve the level of data validity. This study also assesses the perception before the IPE program after the briefing so that it does not accurately describe the perception before the IPE.

CONCLUSION

This study concludes that most students have a good perception and readiness of IPE, both before and after the

implementation of IPE, although some items such as roles and responsibilities and professional identity have a low value compared to other items. Medical students also have lower levels of perception and readiness than pharmacy students. Some solutions that can be done to improve the IPE program are to provide simulations before students go directly to patient a, add supervisors consisting of each profession, and evaluate the existing IPE curriculum in the medical study program. However, overall there is a significant improvement in students' perceptions and readiness after the implementation of IPE.

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