Undergraduate Students' Perceptions and Readiness: An Evaluation of Inter-Professional Education at Central Java, Indonesia

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Abstract. This study aims to describe the perceptions of and readiness for IPE among nursing, medical and pharmacy students. The quantitative descriptive study was conducted in an IPE which held at the three faculties of a private university in Central Java, Indonesia. The IPE was delivered in two sessions with a seven-stage tutorial. The sample was taken using proportionate random sampling and engaged 83 of 425 students. A mean score analysis found that the mean value of students' perception was 88.04 (SD 6.72) for medical students, 84.66 (SD 10.26) for nursing and 81.14 (SD 10.41) for pharmacy students. Meanwhile, the pharmacy students have the highest readiness for the IPE followed by nursing and medical students with 73.45 (SD 7.85), 72.34 (SD 7.35) and 71.32 (SD7.36), respectively. Overall, the students have positive perceptions and readiness toward the program. It may be due to cognitive ability, culture effect, socialization, early clinical experience and IPE exposure in curricula.

Keywords: Inter-professional education; perception; readiness; undergraduate healthcare student.

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1. Introduction

Inter-professional collaboration (IPC) among health care professionals is important to improve outcomes and safety in health care services (Tolleson et al., 2016). To prepare a good IPC, Inter-professional education (IPE) will provide the opportunity for health care professionals to work collaboratively. According to IPE has been defined as:

> *"Occassion when two or more health/social care professions learn with, from and about each other to improve collaboration and the quality of care."*
> *(Centre for the Advancement of Inter-Professional Education [CAIPE], 2002, p. 6)*

IPE in the health sector is being considered as a key factor in providing patient-centered, responsive and high-quality care (Ateah et al., 2011). Furthermore, IPE has been shown to improve the satisfaction of nurses and physicians in emergency departments (Reeves, Goldman, & Oandasan, 2007). IPE has been thought by primary health practitioners in solving complex client's health problems and their ability to utilize other resources (Larivaara & Taanila, 2004). IPE causes positive behavior, organized activities, and quality of care (Guraya & Barr, 2018). IPE also promotes interdisciplinary collaboration and teamwork (Al-Qahtani & Guraya, 2016), reduces the main barriers and preconceptions among different health care groups, and promotes professional competence (Larivaara & Taanila, 2004). Besides these benefits, according to Lapkin, Levett-Jones, and Gilligan (2013), IPE may strengthen the students' attitudes toward IPC and their ability to deal with clinical decision-making.

In a teaching-learning process, IPE can also enable students to understand the roles of each profession, improve their confidence in readiness to collaborate (Soubra, Badr, Zahran, & Aboul-Seoud, 2018) and improve perception and motivation to engage in IPE (Eccott et al., 2012). Having IPE in various health educations can also improve knowledge, skills, and attitudes of learners which could potentially be adopted by practitioners who are unfamiliar with this learning (Guraya & Barr, 2018). Eccott et al. (2012) reported that inter-professional problem-based learning modules improve students' attitudes toward inter-professional teamwork.

Some studies have examined the IPE programs across the world (Aziz, Teck, & Yen, 2011; Gilligan, Outram, & Levett-Jones, 2014). According to (Gilligan et al., 2014), in Australia, IPE provided opportunities for students to interact with other professions to work together on relevant issues. In Malaysia, the implementation of IPE had promoted positive attitudes among the students (Aziz et al., 2011). A study on IPE program conducted in one of the American schools found that female senior nursing students who have more experience in healthcare tend to have more positive attitudes after the program (Wong et al., 2016). In the UK, studies found that students and service consumers reported the benefits of IPE observed via the elucidation of roles and its positive effects on attitudes (Illingworth & Chelvanayagam, 2017). Meanwhile, Indonesian students generally appreciate the benefits of IPE in sharpening their leadership skills,

collaboration, inter-professional communication and in learning to overcome ambiguous role problems (Lestari, Stalmeijer, Widyandana, & Scherpbier, 2016).

There are several studies evaluating the students' perception and satisfaction toward case-based IPE. According to Curran, Sharpe, Forristall, and Flynn (2008), the IPE which based on a case scenario enhancing students satisfaction in small group collaborative learning. Even though IPE well-understood in developed countries, it is however not uniformly observed across developing countries, especially in Indonesia. Accordingly, this study aims to describe the perceptions of and readiness for IPE, among nursing, medicine and pharmacy students in a private university at Central Java, Indonesia.

2. Method

Design
This study was descriptive research using quantitative approach. Data was gathered using a cross-sectional survey. A cross-sectional survey is believed to be the most precise systematic method used to retrieve data from a population at any given point in time (Miller, Strang, & Miller, 2010).

Setting
The study was conducted in three faculties from December 2017 to May 2018 and implemented in a seven-stage tutorial that has done in two days' interaction. The learning objectives of the IPE were to identify and understand inter-professional education in practice, to realize the roles of various healthcare professionals, and to learn communication in practice with students from other disciplines. A case scenario of a patient who has chronic kidney disease was discussed. This topic and guidelines were described in a specific guide book. All three faculties' members were involved as facilitators in an IPE which consists of eight (8) to nine (9) multidisciplinary students. The students were facilitated by at least one of three faculties members and set in 26 big groups. These groups were divided into two small groups which contain 8 to 9 students from three programs. Every group has two-days interactions, which were completed in 100 minutes in the first-day session and independent learning as well as 100 minutes on the second day. On the first day, students were done five steps tutorial started from a reading scenario and defining difficult words, problem identification, brainstorming, systematically problem inventory and formulating learning objectives of the case scenario. After finishing the first day, each small group was asked to have independent learning outside the session for gathering new information. After that, they came to the second day for reporting, discussing and reorganizing new information. In the last session, facilitators assured that the learning objectives among programs have been achieved.

Population and sampling
A total of 425 students from the three faculties participated in the IPE program. The sample was taken using proportionate stratified random sampling. The respondents were selected by a proportional allocation that it's target population is maintained by the sampling strata. This research engaged 83 respondents including 22 students of the School of Medicine, 29 students of the School of

Pharmacy and 32 students of the School of Nursing of a private university at Central Java, Indonesia. This study divided the sample size to all the respondents which multiplied with population from each discipline. Then, it was randomly taken to get the sample from each faculty using students' ID numbers. The sample criteria were the students from nursing/medicine/pharmacy who participate in IPE, have signed informed consent and agreed to contribute to the study.

Instruments

There were two (2) questionnaires used for collecting the data, namely: 1) Interdisciplinary Education Perception Scale (IEPS) and 2) the Readiness for Inter-Professional Learning Scale (RIPLS). The IEPS questionnaire developed by Luecht, Madsen, Taugher, and Petterson (1990) was used to assess the students' perceptions of the IPE. This questionnaire consists of 18 items with a 6-point *Likert* scale. This tool measures four components including competency and autonomy, a perceived need for co-operation, perception of actual cooperation and understanding for another professional team. The RIPLS developed by Parsell and Bligh (1999) was used for assessing the students' readiness for interprofessional learning which consist of 19 items with a 5-point Likert scale and four sub-scales. It measures teamwork and collaboration, negative professional identity, positive professional identity, roles, and responsibilities of students in the IPE.

Data Collection

Data collections were conducted in three faculties after finishing the second day's session. The researchers collected the respondents who have agreed and signed the informed consent. The students have given an explanation about the research aims and it's confidentiality prior to the signing the consent. In this data collection, the researchers were assisted by enumerators for distributing the IEPS and RIPLS questionnaires to the students and ensuring them to complete the questionnaires in the tutorial rooms. The procedures for completing the questionnaires were described after the questionnaire's distribution. Students completed the questionnaires manually by ticking the statements which are match with their perceptions.

Ethical considerations

This research does not against ethical clearance. The informed consent form and participant information sheets explaining the purpose of the study were given to the students. The students were also verbally informed that participation in this study would be voluntary and nonparticipation would not affect their grades or marks in their courses.

Data analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) for Windows (version 20). Descriptive statistic (percentage) was used to describe the characteristics of respondents. Mean and Standard Deviation were used to define the scores of IEPS and RIPLS among the students.

3. Result

Student characteristics

As shown in Table 1, the majority of the respondents were female (83%) and placed in the fourth (4th) semester of study (65.1%). Approximately 77% of the respondents were of Java ethnicity with the place of origin of Java (80%). Most of the respondents were aged 19 and above (96.4%).

The perceptions of IPE among study programs

This study revealed that the average IPE perception score of students from three study programs tends to be positive with ranging score from 81.14 to 88.04 for all departments. The highest mean value of IEPS was 88.04 (SD 6.72) for medical students followed by nursing 84.66 (SD 10.26) and pharmacy students 81.14 (SD 10.41). Regarding all subscales of IEPS, medical students have the highest scores except on the subscale of actual cooperation. Nursing students have a little bit higher mean of scores of the actual cooperation than medical students with only 0.16 difference but have a considerable difference from pharmacy students with 1.43. The mean value of the subscale of competency and autonomy for medical students was 39.50 (SD 2.84), nursing students 38.03 (SD 4.23) and pharmacy students 36.62 (SD 4.37). For the subscale of perceived need for cooperation, pharmacy students have a higher score than nursing with 9.45 (SD 1.48) and 8.88 (SD 1.48) respectively. On the other hand, nursing students have a higher score than pharmacy students on the subscale of understanding other roles (Table 2).

The students' readiness of IPE among study programs

With regards to the students' readiness for IPE, the average score tends to also be positive with the score range of 71.32 to 73.45. The highest score was 73.45 (SD 7.85) for pharmacy students followed by nursing with 72.34 (SD 7.35) and medical students with 71.32 (SD 7.36). Interestingly, pharmacy students have the highest mean-value for all the subscales of readiness for IPE. In detail, all the programs have similar mean scores for the subscale of teamwork and collaboration, which were about 40. The medical and nursing students have similar mean scores for the subscale of professional identity with 22.86 (SD 2.19) and 22.84 (SD 2.11) respectively. With regards to the subscale of roles and responsibility, medical students have the lowest score with 8.36 (SD 1.56), whereas nursing and pharmacy students have a similar mean score with a range of 9 to 9.50 (Table 2).

4. Discussion

The perceptions of IPE among study programs

This study revealed that the students' perception scores tend to be positive toward IPE. The students perceive that the program brings them an understanding of their competence and autonomy, needs of cooperation, actual cooperation and understanding of others' value. The medical students have more positive perceptions of IPE than other students from pharmacy and nursing programs. This is perhaps since, in this university, the enrolment requires the medical students to have the highest passing grade as compared to other students. Their abilities and efforts undertaken to obtain their grades have likely enabled them to think with experience and this has influenced how they

perceive IPE. This aligns with (Witt & Dorsch, 2009) who stated that cognitive ability affects the perceivers' performance.

Interestingly, the medical students have the highest score on all subscales of IEPS except the subscale of actual cooperation. The actual cooperation score deficiency may be due to lack of clinical exposure rendering them unable to perceive how real cooperation occurs to solve the case scenario. On the other hand, nursing students have the highest score on it. Their clinical practice experiences before undertaking the IPE may have enhanced their understandings of the cooperation in a real setting. Nursing students have several experiences of clinical placement from their third semester while medical and pharmacy students have not had any clinical experience before this study. This study is similar to Lestari et al. (2016) which found that better understanding in the IPE can be triggered by early exposure to clinical practice, and creates both positive and negative perceptions in the students on their IPE, communication and leadership skills. This study is also relevant to (Dahlgren, Gibbs, Greenwalt, Hahn, & Dietrich, 2018) that described the nursing students having a better knowledge of roles and responsibility owing to their clinical experience. The clinical exposure can be prepared for all healthcare students early in their curriculum to introduce them about other professional roles. Therefore, it will strengthen their confidence in teamwork and collaboration in their next levels.

While nursing students have higher scores of actual cooperation, they have the lowest scores of perceived needs for cooperation than other students. It seems that nursing students have dearth understanding of the cooperation need with other professionals. To our knowledge, in Indonesian culture especially Javanese, people perceive and believe that medical doctors or medical students are more prestigious than other health professions. According to Lestari et al. (2016), it is widely believed in Indonesia that doctors are ranked higher in status when compared to other professions, which might result in anxiety in nursing students that will ruin their confidence in IPE. The nursing students think that they only assist doctors in managing the patients. The majority of people do not understand that nurses have different roles and competencies with medical doctors. In contrast, nursing students reflect that they have their primary care procedures that the medical or other health professional students do not comprehend. These two opposite phenomena are perhaps the reason why nursing students have an inadequate understanding of cooperation needs. They believe that they can perform their roles to care for patients independently. Also, compared to the medical and pharmacy students, the nursing students have undertaken the IPE lesser times. In this study, they undertook the IPE for the first time while medical and pharmacy students have been introduced to the IPE early in the curricula. Their absence of IPE experience in the early study might affect their IPE perception scarcity.

Table 1. Demographic characteristics

Characteristics	n=83	Percentage (%)
Sex		
Male	13	15.7
Female	70	84.3
Age		
≤ 18	3	3.6
≥ 19	97	96.4
Ethnic group		
Javanese	64	77.1
Others	19	22.9
Place of origin		
Java	80	76.9
Others	20	24.1
Academic program		
Medicine	22	26.5
Pharmacy	27	34.9
Nursing	32	38.6
Semester		
4	54	65.1
6	29	34.9

The readiness of IPE among study programs

The result of this study is similar to a study by Sytsma et al. (2015) which revealed that the overall students' readiness for IPE was also tended to be positive. With regards to the students' readiness, pharmacy students seem to be the readiest groups to have IPE. Different from the perception of IPE, the pharmacy students have higher readiness for all the subscales including teamwork and collaboration, professional identity and roles and responsibility when compared to other students. Besides the pharmacy students placed on one year above other students, they have several experiences of IPE before the study. This condition may boost their readiness to participate more in IPE programs. Their readiness may contribute to their ability to anticipate the situation that will be experienced, which will help in suppressing the emergence of concerns.

Table 2. The mean score of IEPS and RIPLS for the three disciplines

Variables	Medical [a]M (SD)	Pharmacy [a]M (SD)	Nursing [a]M (SD)
Total [b]IEPS	88.05 (6.72)	81.14 (10.41)	84.66 (10.26)
Subscales of [b]IEPS			
Competency and autonomy	39.50 (2.84)	36.62 (4.36)	38.03 (4.23)
Perceived need for cooperation	9.86 (1.08)	9.45 (1.47)	8.87 (1.48)
Actual cooperation	24.50 (1.66)	23.28 (2.87)	24.66 (2.66)
Understandings others' value	14.18 (1.14)	11.79 (1.698)	13.09 (1.89)
Total [c]RIPLS	71.32 (7.36)	73.45 (7.86)	72.34 (7.35)
Subscales of [c]RIPLS			
Teamwork and collaboration	40.09 (3.61)	40.55 (3.25)	40.25 (3.47)
Professional identity	22.86 (2.19)	23.41 (2.61)	22.84 (2.11)
Roles and responsibility	8.36 (1.56)	9.48 (1.99)	9.25 (1.76)

[a] M (SD)   : Mean (Standard Deviation)
[b] IEPS   : Interdisciplinary Education Perception Scale
[c] RIPLS   : Readiness for Inter-Professional Learning Scale
*N = 83

Different from the mean score of the perception of IPE, the medical students have the lowest score of their readiness for the IPE. The result of this study is relevant to Keshtkaran, Sharif, and Rambod (2014) and Lestari et al. (2016). Lestari et al. (2016) explained that Indonesian medical students opposed the concept of IPE since they did not want to share knowledge with other health professionals. They gave the impression of defending their 'cognitive exclusivity' against current healthcare practices because nurses and midwives can manage certain medical treatments in the community. This condition may risk patient insecurity because a certain professional perceives as superior to others (Manilall & Rowe, 2016). On the contrary, promoting patient safety need for healthcare awareness of collaboration. Collaboration with other teams is important to improve patient care quality (Loversidge & Demb, 2015). Therefore, they suggest that an educational institution must ensure the collaboration skills of its students to move away from their profession ego and to work together in a team. This can be formed by building the confidence of practitioners to collaborate with others in a team, which will also increase the student's perceptions of collaboration (Manilall & Rowe, 2016).

With regards to professional identity, the medical and nursing students have similar readiness score, and these are lower than the pharmacy students' score. This may be due to their understanding of the professional identity being gained only in the process of IPE. They have not known each other, and the program is the first time for nursing students to interact with other students. The pharmacy students may define the professional identity because they were on a higher

level compared to other students. Experience in learning may affect their understanding and enhance their ability to determine professional identity.

In terms of the understanding of roles and responsibility, pharmacy and nursing students seem to have better readiness compared to medical students. It can be believed that the groups that understand other roles are characterized as good teams. It is because the readiness in understanding roles is vital to respect and recognize the borders of each role because this has the potential of influencing the patients' recovery (Nancarrow et al., 2013). Likewise, according to (Illingworth & Chelvanayagam, 2017), students and service consumers reported that IPE helps in clarifying roles or affects attitudes positively. To propagate the awareness on professional roles, the educational institution should provide learning opportunities which can strengthen the students' understanding about the roles, responsibilities and the contribution of other professional students (MacDonald et al., 2010). It means that the IPEs have to be implemented for healthcare students at any level as it will promote the higher quality in the inter-professional collaboration.

For better implementation, the introduction or socialization of IPE should be set before the IPE (Dahlgren et al., 2018). Although overall students in this study have positive perceptions and readiness toward IPE, their scores are varying across programs. This may be affected by the process of socialization that has been delivered by each study program. Each study program introduces the IPE guideline separately before the IPE was begun. In addition, in the socialization of IPE, the lecturers only explain about the technical process such as the place, time, facilitators, general topic of and what they will do in the IPE rather than the IPE explanation and competencies for them.

To strengthen the perception of and readiness for IPE, there are several possible efforts to further support it. Besides introducing the students to socialization of IPE (Dahlgren et al., 2018), early clinical practice (Dahlgren et al., 2018; Lestari et al., 2016) and early IPE exposure (Bridges, Davidson, Soule Odegard, Maki, & Tomkowiak, 2011; Cant, Leech, & Hood, 2015; Lestari et al., 2016), the institutions need to prepare and develop the IPE which should be set with all professional programs included. This may be beneficial in boosting the students' positive attitude toward IPE and their perceived value of collaboration learning. Longitudinal studies may be valuable to better understand the teaching-learning process in the IPE context (Riskiyana, Claramita, & Rahayu, 2018).

Limitations
The main limitation of this study was that the respondents only came from one university and hence the sample size was relatively small. This factor may reduce the generalizability of the results to all healthcare students in other universities. Additionally, the socialization of IPE was delivered in each department by their faculty members, therefore its distribution may be different from each other. It may result in a different understanding among the students. This study also involved students from a different level of study which probably influences their different perceptions and readiness of IPE. Besides its limitations, the data collection has only been taken after the IPE implementation. Therefore it may not describe the students' perception and readiness before the

IPE. There is a need for further research on pre and post IPE program as well as longitudinal research to evaluate the IPE sustainability to improve students' perceptions of and readiness for the IPE.

5. Conclusion

Overall, students tend to have positive both for perceptions and readiness toward the program. The scores of the IEPS and RIPLS of this study are varied across the study programs. Medical students have the highest score on the perception of IPE but they have the lowest score of readiness towards IPE. On the contrary, pharmacy students have the opposite situation. The nursing students' perceptions and readiness scores are placed in between medical and pharmacy. This study revealed that the better perception and readiness toward IPE may be influenced by several factors including cognitive ability, a certain culture which belief of superiority status of professionals, socialization of the IPE, early clinical and IPE exposure. These factors can be minimized by developing the IPE in the healthcare curricula as early as possible to boost the students' attitude toward IPE.

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