









Interprofessional Education Among Pharmacy, Medicine and Public Health Faculties: Perspective of Third Year Students

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Abstract. In Indonesia Interprofessional education (IPE) is a very challenging issue. The complexity of the daily tasks, imbalance of 'students' proportion, background variability of the students and facilitators and various locations of the faculties may operate as obstacles to IPE activities and need to be evaluated. This study aimed to determine the effectiveness of the IPE program, which was implemented in the third year of pharmacy, public health and medical students. As many as 460 students from three faculties were encouraged to this program. General lecture from the teacher of three faculties, two times of student focus group discussions (FGD) and a classical presentation were conducted to evaluate the IPE program using the questionnaire as the instrument. The questionnaire contained the domains of communication, collaboration, role-responsibility, problem-solving approach, conflict management and team empowerment. A lecturer facilitated a group of about ten students for two times FGD. The outcomes were posters with various topics in each group. In total, 460 students participated in this program. The proportion of pharmacy, public health and medical students was 41.3, 47.8 and 10.9%, respectively. Overall, the score of all domains was improved at the end of the programs, with communication, role-responsibility and problem-solving approach showing the most improvements. At the end of the programs, all domains show significant improvement, except for conflict management in the pharmacy faculty. Only communication and role-responsibility domains considerably improved in the public health faculty. In contrast, there were no appreciable variances and all domains show a decrease in value in the medical faculty. Our study shows the effectiveness of IPE programs for third-year students in the pharmacy and public health. However, the IPE programs should be more promoted in the third-year of medical faculty because the students are almost at the end of their study period. To the best of authors' knowledge, this study, which is involved pharmacy, public health and medical students, is the first conducted in Indonesia among third-year students and to include a wide range of measuring domains.

Keywords: Interprofessional · Education · Pharmacy · Public health · Medical

1 Background

Interprofessional education (IPE) is a learning setting where two or more professional students can collaborate and learn from one another to improve the standard of health-care services. This notion contrasts with multi-professional education, in which students of two or more professions learn in a comparable manner. A previous study presented that IPE can support interdisciplinary collaboration and teamwork, reduce barriers and stereotypes among the multidisciplinary collaboration and teamwork, and decrease barriers and stereotypes among health professionals [1, 2]. IPE is a crucial strategy for students in health programs to get ready to start practicing. IPE has been promoted by some international health organization, as a part of the redesign of the health service quality. Thus, recognizing the IPE started from the university education is an important step in helping students develop their IPE skills [3].

A previous study that compared and contrasted empathy, interprofessional collaboration skills and the long-life learning among general practitioners in Spain and Latin America, empathy and interprofessional collaboration were found to have favourable effects [4]. Another earlier study demonstrated that cooperation, comprehension of patients' problems, and interprofessional communication skills all improved among undergraduate pharmacy students. The preceptors of community pharmacies facilitated the students during the IPE process. Even though both of them needed further training about IPE, they also felt that the IPE project must be continued to improve 'patients' care and to avoid the medication errors [5].

Due to the effort and numerous constraints among the study programs, IPE is growing in importance in Indonesian universities. Some of the obstacles that could arise during the IPE implementation were curriculum, timetable, workload of facilitators, location and the students' participation [2]. The pharmacy curriculum is quite strict, and the laboratory practices account for most of the "students" performance. Thus, the visibility of the IPE program has to adjust with the schedule of the undergraduate pharmacy program [6]. The effectiveness of the IPE program must be evaluated by identifying the outcomes. According to a meta-analysis, the IPE of various programs was successful and had a favorable influence on education. The effectiveness of the IPE program was defined from the 'students' knowledge, skill and attitude [1]. The objective of this study is to evaluate the performance of IPE program, which was implemented for the third-year students in pharmacy, public health, and medical students.

2 Methods

A cross-sectional study was conducted, involving three faculties including faculty of pharmacy, public health and medicine in the University of Ahmad Dahlan, Yogyakarta, Indonesia. 3rd year of students from each faculty were recruited to follow the IPE programs that the coordinator of the IPE program had already created.

The pre-questionnaire was used to evaluate the students' prior understanding about IPE before the IPE program began. The activities were clustered into three categories. Firstly, the coordinator program for IPE then gave the general lecture on IPE for 50 min. Following that, the students were given the brief lecture by lecturers from faculties of

Table 1. Students' characteristics

Faculty	n	%
Pharmacy	190	41.3
Public Health	220	47.8
Medicine	50	10.9
Sex		
Male	62	13.5
Female	398	86.5

pharmacy, public health and medicine. Secondly, the coordinator of the IPE program divided the students into a small group consisting of students from three faculties. Each group consisted of 8–10 students. The students, then, joined in two weeks-discussion in particular topics within their respective group. Thirdly, the students developed a poster about the topic and presented the posters in the fourth week. The students completed the IPE program and the post questionnaire after the presentation. In total, the students participated in the IPE activities for 4 weeks.

The IPE questionnaire was adapted from the International Collaborative Competencies Attainment Survey (ICCAS). This questionnaire was designed to assess the change in interprofessional-related competencies in healthcare students before and after the IPE programs [7]. We performed the paired T-test analysis to define the effectiveness of the IPE program.

3 Results

460 students from the pharmacy, public health and medicine faculty were recruited. Most of the students were female (86.5%), mostly from the faculty of public health (47.8%). Table 1 presented the characteristics of the students in the IPE program.

The changes between the competence scores before and after the IPE program in 4 weeks program, were shown in Table 2. The communication, role-responsibility and collaborative patient/family-centred approach showed significant differences.

The variations in competency scores across the three faculties were seen in Table 3. With the exception of conflict management, the IPE program at the Pharmacy Faculty effectively modifies some competencies. In the Public Health Faculty, only communication and role-responsibility significantly changed after the IPE program. However, there were competences that differ significantly within the Medicine Faculty.

Table 2. The competencies scores differences before and after the IPE program

Competency	Before IPE (Mean \pm SD)	After IPE (Mean \pm SD)	<i>p value</i>
Communication	5.7 \pm 0.96	6.1 \pm 0.89	0.00*
Collaboration	5.9 \pm 1.02	6.0 \pm 1.00	0.89
Role and responsibility	5.6 \pm 1.01	6.0 \pm 0.94	0.00*
Collaborative patient/family centered approach	5.6 \pm 1.01	5.8 \pm 0.96	0.03*
Conflict management	6.0 \pm 1.03	6.1 \pm 0.95	0.15
Teamwork	5.8 \pm 0.98	5.9 \pm 1.00	0.72

* Significant

Table 3. Competencies score differences in three faculties.

Faculty	Competency	Before (Mean \pm SD)	After (Mean \pm SD)	<i>p-value</i>
Pharmacy	Communication	5.8 \pm 0.96	6.1 \pm 0.84	0.00*
	Collaboration	5.9 \pm 1.05	6.1 \pm 0.93	0.14*
	Role and responsibility	5.6 \pm 1.01	6.1 \pm 0.91	0.00*
	Collaborative patient/family centered approach	5.6 \pm 1.03	5.9 \pm 0.96	0.02*
	Conflict management	6.0 \pm 0.99	6.2 \pm 0.87	0.09
	Teamwork	5.9 \pm 0.95	6.1 \pm 0.95	0.02*
Public Health	Communication	5.6 \pm 0.97	6.0 \pm 0.94	0.00*
	Collaboration	5.9 \pm 1.04	6.0 \pm 1.09	0.24
	Role and responsibility	5.5 \pm 1.01	5.9 \pm 0.98	0.00*
	Collaborative patient/family centered approach	5.4 \pm 1.01	5.7 \pm 1.10	0.16
	Conflict management	5.8 \pm 1.07	6.1 \pm 1.05	0.17
	Teamwork	5.8 \pm 1.03	5.9 \pm 1.07	0.20
Medicine	Communication	6.1 \pm 0.83	6.1 \pm 0.80	0.74

(continued)

Table 3. (continued)

Faculty	Competency	Before (Mean \pm SD)	After (Mean \pm SD)	<i>p</i> -value
	Collaboration	6.4 \pm 0.74	5.9 \pm 0.84	0.13
	Role and responsibility	6.1 \pm 0.87	6.0 \pm 0.79	0.42
	Collaborative patient/family centered approach	6.0 \pm 0.91	5.9 \pm 0.86	0.45
	Conflict management	6.4 \pm 0.84	6.1 \pm 0.82	0.12
	Teamwork	6.2 \pm 0.81	5.9 \pm 0.77	0.06

4 Discussion

According to the current study, IPE programs were effective in enhancing the IPE competencies in pharmacy students, a little impact on public health students and no significant impact on medical students in the University of Ahmad Dahlan. The IPE activities were conducted in 4 weeks, which can change the IPE perspective. A previous study mentioned that one week IPE activities demonstrated the change of students' perceptions about IPE [Interprofessional Education Week: the impact of active and passive learning activities on students' perceptions of interprofessional education–PubMed (nih.gov)].

In general, all competencies received higher scores. However, when conducting the analysis separately for each faculty, the competencies scores in medicine students was remained unchanged. These results could be caused by the assumption of the students about the IPE programs. The IPE programs were not part of a mandatory course in the curriculum. The IPE program was listed as an extra-curricular program. These factors were also listed as one of the obstacles to the IPE in the previous study [2]. The effectiveness of the IPE programs may be hampered by the students' lower intentions. It was recommended for the future implementation to include this program's evaluation procedure and score in the students' overall grade. The medical faculty has been already applied the problem based-learning in their learning process. However, the pharmacy and public health students still used classical learning.

A meta-analysis showed interesting results in various competencies of IPE. The students' abilities in collaboration and teamwork could be perceived as having a greater impact. However, IPE programs did not interfere with the role or responsibility. The more positive attitudes were performed by the medical students. This study also highlighted gender, which may have an impact on the effectiveness of IPE [8]. Another IPE program included the medicine and nursing students stressed the value of interprofessional and interdependent work. Only a small proportion of them mentioned that the university did not pay attention to the students' study plan, especially related to interprofessional work [9]. These results showed that the effectiveness of the IPE programs can be influenced by the university's education environment. The problem based-learning is not implied in every study program in a university. Faculty of medicine is the most faculty used the

problem-based learning as the learning method. The pharmacy and public health faculties are still using classical learning as the learning method. The leaders of university's role also influence the IPE activities. They have to facilitate these activities, by providing the training for the facilitators, arranging the schedule and managing the implication of IPE.

Another barrier that can influence the effectiveness of the IPE was the facilities and infrastructure. The IPE program was synchronously conducted in some study programs. In addition to the different schedule, the university facilities must support the programs [1]. IPE programs for pharmacy faculty have previously been reported in many publications. International organizations, such as Accreditation Council for Pharmacy Education, emphasized the importance of IPE in pharmacy. IPE also became the standard for the entry-level Pharmacy professionals [10].

The importance and urgency of IPE in Indonesia were mainly related to the expansion of health care through promoting positive knowledge and attitudes toward teamwork and an understanding of the roles and responsibilities of each member of a team of healthcare professionals. Thus, it was crucial to apply IPE program as earlier as possible. The limitation of the current study was related to the fact that the subgroup analysis based on gender and age were not performed.

5 Conclusion

The four-week of IPE activities over three-years students were effective in increasing the IPE competencies in pharmacy and nursing students. The learning methods could influence the students' perception about IPE. Moreover, the role of university leaders could enhance the IPE activities.

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References

1. Guraya, S. Y., & Barr, H. (2018). The effectiveness of interprofessional education in health-care: A systematic review and meta-analysis. *Kaohsiung Journal of Medical Sciences*, 34(3), 160–165. <https://doi.org/10.1016/j.kjms.2017.12.009>
2. Carlisle, C., & Taing, M.-W. (2021). Interprofessional education between dentistry and pharmacy students: delivery, barriers and facilitating implementation. *Australian Dental Journal*, 66(4), 351–357. <https://doi.org/10.1111/adj.12856>
3. van Diggele, C., Roberts, C., Burgess, A., & Mellis, C. (2020). Interprofessional education: tips for design and implementation. *BMC Medical Education*, 20(Suppl 2), 1–6. <https://doi.org/10.1186/s12909-020-02286-z>
4. San-Martín, M., Roig-Carrera, H., Villalonga-Vadell, R. M., Benito-Sevillano, C., Torres-Salinas, M., Claret-Teruel, G., Robles, B., Sans-Boix, A., Alcorta-Garza, A., & Vivanco, L. (2017). Empatía, habilidades de colaboración interprofesional y aprendizaje médico permanente en residentes españoles y latinoamericanos que inician los programas de formación médica especializada en España. Resultados preliminares. *Atencion Primaria*, 49(1), 6–12. <https://doi.org/10.1016/j.aprim.2016.02.007>

5. O'Connell, M. B., Pattin, A. J., Gilkey, S. J., Dereczyk, A. L., Lucarotti, R. L., & Chackunkal, S. J. (2021). Feasibility of Interprofessional Education in a Community Pharmacy. *Journal of Pharmacy Practice*, 34(6), 988–995. <https://doi.org/10.1177/0897190020930532>
6. Buring, S. M., Bhushan, A., Broeseke, A., Conway, S., Duncan-Hewitt, W., Hansen, L., & Westberg, S. (2009). Interprofessional education: definitions, student competencies, and guidelines for implementation. *American Journal of Pharmaceutical Education*, 73(4), 59. <https://doi.org/10.5688/aj730459>
7. Archibald, D., Trumpower, D., & MacDonald, C. J. (2014). Validation of the interprofessional collaborative competency attainment survey (ICCAS). *Journal of Interprofessional Care*, 28(6), 553–558. <https://doi.org/10.3109/13561820.2014.917407>
8. Wang, Z., Feng, F., Gao, S., & Yang, J. (2019). A Systematic Meta-Analysis of the Effect of Interprofessional Education on Health Professions Students' Attitudes. *Journal of Dental Education*, 83(12), 1361–1369. <https://doi.org/10.21815/JDE.019.147>
9. Tamayo, M., Besoáfn-Saldaña, A., Aguirre, M., & Leiva, J. (2017). Teamwork: Relevance and interdependence of interprofessional education. *Revista de Saude Publica*, 51(1), 1–10. <https://doi.org/10.1590/S1518-8787.2017051006816>
10. Olsen, A. A., Lupton-Smith, C. P., Rodgers, P. T., & McLaughlin, J. E. (2021). Characterizing research about interprofessional education within pharmacy. *American Journal of Pharmaceutical Education*, 85(8). <https://doi.org/10.5688/ajpe8541>

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