Scientific Foundation SPIROSKI, Skopje, Republic of Macedonia
Open Access Macedonian Journal of Medical Sciences. 2022 Jan 28; 10(E):540-545.
https://doi.org/10.3889/oamjms.2022.8404
eISSN: 1857-9655
Category: *E - Public Health*
Section: *Public Health Education and Training*

Competency Achievement of Apothecary Students through Community Health Interprofessional Program

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Edited by: Sasho Stoleski
Citation: Sari CP, Hanifah S, Medisa D, Rahmawati R. Competency Achievement of Apothecary Students through Community Health Interprofessional Program. Open Access Maced J Med Sci. 2022 Jan 28; 10(E):540-545. https://doi.org/10.3889/oamjms.2022.8404
Keywords: Interprofessional education; Experiential learning; Apothecary students; Medical students
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Received: 26-Nov-2021
Revised: 16-Jan-2022
Accepted: 18-Jan-2022

Funding: This study was supported by the Directorate of Academic Development (DPA) of Universitas Islam Indonesia for funding through learning innovation grant
Competing Interests: The authors have declared that no competing interests exist

Abstract

AIM: The aims to measure the achievement of inter-professional competency of apothecary and medical students after taking IPE in a form of home care visit.

METHODS: Fifty-eight students of pharmacy and seventy-eight medical students are listed in the community health interprofessional program (COHIP) by simulation on prescription service and followed by home visit to patients of public health center. Evaluation is conducted by taking the design of pre-test and post-test quasi-experimental without group control. The research result is measured using Interprofessional Collaborative Competency Attainment Scale (ICCAS) consists of communication, collaborative, roles and responsibilities, collaborative patient/family-centered approach, conflict management/resolution, and team functioning. The compiled data are displayed descriptively in which statistical paired sample T-test was conducted.

RESULTS: 134 respondents involved in this program had finished the pre-test and post-test. The highest mean values of IPE activity of apothecary and medical student are collaborative and conflict management/resolution domain. The overall statistical analysis result of ICCAS domains and items shows significant improvement.

CONCLUSION: Home visit program and simulation on prescription service in a frame of community health interprofessional program have effect toward the improvement of inter-professional competency of pharmacy and medical students, which consists of Communication, Collaborative, Roles and Responsibilities, Collaborative Patient/Family-Centered Approach, Conflict Management/Resolution, and Team Functioning.

Introduction

Interprofessional education (IPE) is a learning involving two or more students from different health professions and learns about, from, and with each other to improve collaboration and outcome of patients [1]. Some studies reported that IPE activity gives a positive effect towards perception, response, knowledge, changes in behavior, professional practice, and health improvement of patients [2], [3]. Besides, IPE activity has proven to give positive impact on the implementation of collaboration practicum when the student has graduated and works in a health facility [4]. In pharmacy higher education level, IPE has just started to develop in the recent years along with the needs in expanding role of apothecary in health service. As a health worker, apothecary has a role in patient care in health facility: both hospital and community. One of the main competencies that must be owned by a community pharmacist-to-be is the ability to do outpatient drug service and home visit. In order to prepare this competency, apothecary students must be able to collaborate multidimensional, so that IPE must be admitted in the learning. Thus, the learning in apothecary study program has to be designed to achieve both pharmaceutical and IPE competency: Able to communicate, collaborate, and be responsible professionally.

An objection related to the implementation of IPE so far is the difficulty in managing the program among study programs. Moreover, the curriculum is still oriented to the knowledge competency in both academic and skills with a massive need in semester credit units. Therefore, it is difficult to include IPE in the semester credit units. This causes only a little number of study programs that implement IPE simultaneously. In fact, there has not been any standard design on how IPE must be given in apothecary education. In general, there are two kinds of IPE implementation design: First is to make a particular program to achieve IPE competency, second is to hold a course together with other departments following the available curriculum. In our institution, IPE is designed by using the second design, which is to implement IPE as a part of course between apothecary and medical students by combining the learning objective of two courses from the two departments in one activity.

This program is designed to achieve the knowledge competency in the form of patient care in the community, and IPE competency in a form of Community Health International Program (CIHOP). The positive effect of IPE implementation can be depended on the content of material, program design, and the way of delivery [1]. The best practice in some colleges is still diverse in both material and method [5]. One of the learning methods that have been known for a long time as an effective approach is experiential learning [6]. Implementation of this method in IPE, indeed, it gives positive perception [7]. Other study states that IPE with experiential learning improves self-confidence of the team members in communicating to determine the best solution for patients [6], [7]. In general, publication about the effectivity of IPE program only uses IP competency point of view. As in the previous explanation, academician needs to get a broader overview about how to elaborate two learning objectives in one program. In addition, evaluation was not only being analyzed from IP competency, but also from academic competency. This result will also validate the previous report showing the collaborative improvement after a half day of prescription simulation service program [8]. Besides, this paper is also completed the evaluation from previous program that reports the influence of IPE using experiential learning on the changes in perception and self-confidence [6], [7]. The effectiveness of CIHOP is evaluated using standard instrument that is ICCAS, which consists of communication, collaborative, Roles and Responsibilities, Collaborative Patient/Family-Centered Approach, Conflict Management/Resolution, and Team Functioning.

Methods

Ethical statement

This research paper received ethical approval from Faculty of Medicine of Universitas Islam Indonesia No 26/Ka. Kom. Et/70/KE/XI/2019.

Study design

The activity of inter-professional education (IPE) was implemented to the third year students of apothecary and medicine profession program of Universitas Islam Indonesia on November to December 2019 with pre-test and post-test quasi-experimental design without group control.

Subject

The IPE activity involved students from two departments: first year student of apothecary program and fourth year undergraduate medical students. There are 78 students of medicine who follow pediatrics block and 56 apothecary students who join in the course of community pharmacy block. Both students of medicine and apothecary are randomly divided into small groups consisted of four students of medicine and two of apothecary in average.

Technical information

IPE method conducted in the CIHOP used experiential learning approach through practicum on prescription service simulation and followed by home visit to public health's patients of Bantul region. The activity is started by refreshing about the importance of IPE, and then having simulation on prescription service in laboratory for 3 h/day in 3 days then continued with home visit for 8 hours/day for 2 days straight.

The prescription service was started by giving a real case scenario with pediatrics-related topic played out by one of the medical students acted as patient of the simulation. The task of the medical students is to explore the patients' problem and write down the prescription corresponding to the case scenario. The apothecary students perform a series of dispensing process starts from verification, screening, preparation, and submission. In the screening phase, the students may confirm the medical students related to the problems encountered covering administrative, pharmaceutical, and clinical. To overcome the problems, the students of apothecary and medicine are communicating with each other about the availability of prescription, medicine, dosage form, dosage strength, and the possibility of Drug Related Problems (DRPs) and the handling. After there is an agreement, the prescription is being formulated, prepared, and issued. On the 2nd and 3rd day, they do the similar method, but with different case. The intended repetition is to enrich the cases so that the ability of prescription service of the students is getting better.

Home visit activity was guided by one doctor and a pharmacist from the public health of practicum location. Before the home visit, each group assists the public health's doctor to determine the patient that will be given home visit care. The students then ask the patient for approval to have home visit care. During the home visit, the pharmacy students will ask about medication history, its storage, the way to consume it, its observation, and obedience. Meanwhile, the students of medicine do some checking on the growth and development of the patients' disease. After that, the students of medicine and apothecary make a report related to the home visit and present it in front of other groups and preceptors. Students are required to be able to communicate, collaborate, solve patient's problems, and give recommendation based on each discipline competency.

Statistical analysis

The knowledge competency is rated by using assessment rubric for practicum and home visit. The effectivity of IPE in improving competency of knowledge is also evaluated by comparing scores during both simulation practicum and home visit with and without IP. IPE competency is measuredly before and after CIHOP using ICCAS questionnaire. The scores of pre-test and post-test using Inter-professional Collaborative Competency Attainment Scale (ICCAS) instrument measure the effectiveness of IP. ICCAS questionnaire consists of 20 statement items and is divided into six domains: Communication, Collaborative, Roles and Responsibilities, Collaborative Patient/Family-centered Approach, Conflict Management/Resolution, and Team Functioning.

Intervention of pre-test and post-test on the ICCAS questionnaire is measured by scale 1-7, in which one was strongly disagree and seven was strongly agree. The result of questionnaire score is served descriptively and statistically tested using paired sample T test (significance of p value<0.05). Besides ICCAS, students are also required to fill up an open statement about response related to CIHOP program to show a qualitative result.

Results

Seventy-eight students of medicine and 56 students of apothecary are involved in IPE course, in which they have filled up questionnaire of both pre-test, and post-test completely. The result of ICCAS instrument measurement on 134 respondents can be seen in Figures 1 and 2. Figures 1 and 2 show an improvement of pre-test and post-test score of survey result of apothecary and medical students. The highest post-test score of apothecary students is in the domain of collaboration and conflict management. Meanwhile, the highest post-test score of medical students is in the domain of communication and team functioning. In addition, the biggest influence of IPE is seen in the domain of team functioning on apothecary students and domain of communication on medical students, which is seen from the most score increase.

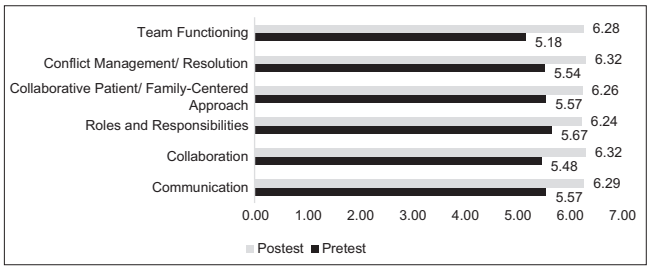

Figure 1: The result of ICCAS pre- and post-test questioner survey on "Apothecary Students"

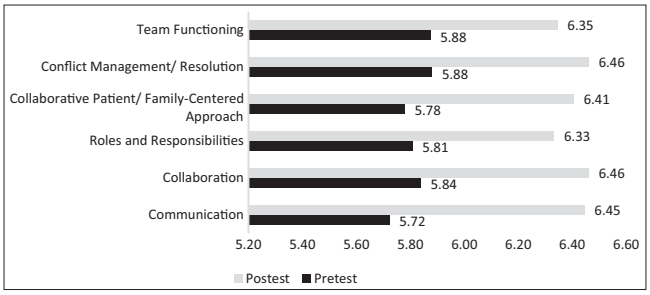

Figure 2: The result of ICCAS pre- and post-test questioner survey on "Medical Students"

Table 1 shows the result of score improvement on both apothecary and medical students in all domains. The mean score improvement of ICCAS questionnaire survey of each domain is proven by analysis test of statistical paired sample t test (Table 1), in which the statistic result shows p value = 0.000 ($p<0.05$). It means that IPE activity gives impact toward ICCAS domain. IPE of apothecary and medical students is able to improve the ability of communication, collaboration, responsibility, Collaborative Patient/Family-centered Approach, Conflict Management/Resolution, and Team Functioning (p=0.000).

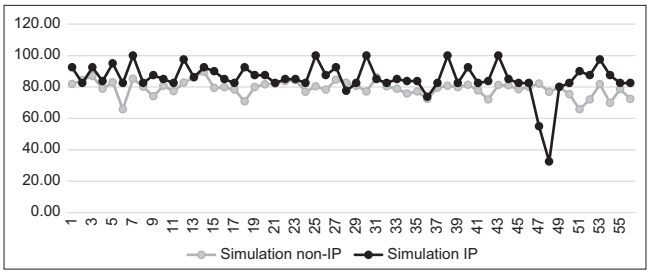

Figure 3: Range of score on dispensing practice competency among 56 pharmacy students. (Score of dispensing skills; non IP 79.21(4.), IP 85.71 (10.3), p = 0.000)

A number of the lowest post-test score of both apothecary and medical students are in the domain of role and responsibility, which is recognizing "how other's skills and knowledge complement and overlap with my own" (mean=6.13) for apothecary students, and "identifying and describing my abilities and contributions to the IP team" (mean=6.28) for medical students. The effectiveness of CIHOP in achieving courses' learning objective can be seen in Figures 3 and 4. Competency achievement of apothecary

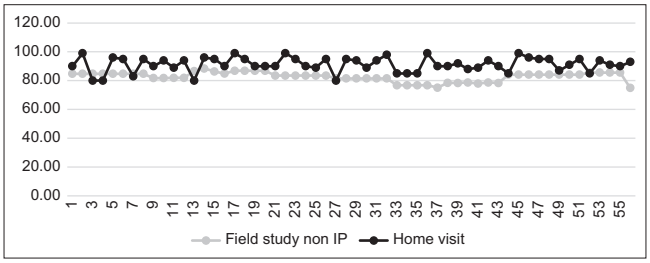

Figure 4: Range of score on home visit competency among 56 pharmacy students. (Score of home visit; non IP 82,7 (3.3), IP 91.26 (5.1), p < 0.001)

Table 1: The survey result of Interprofessional Collaborative Competency Attainment Scale questionnaire domain on educational inter-professional activity of apothecary and medical students

Domain	Items	Apothecary (*n* = 56)		p*	Medicine (*n* = 78)		p*
		Pre-test, mean (SD)	Post-test, mean (SD)		Pre-test, mean (SD)	Post-test, mean (SD)	
Communication	Promote effective communication among members of an IP team	5.57 (0.57)	6.32 (0.47)	< 0.001	4.97 (0.87)	6.51 (0.50)	< 0.001
	Actively listen to IP team members' ideas and concerns	5.36 (0.55)	6.25 (0.55)		4.92 (0.73)	6.42 (0.52)	
	Express my ideas and concerns without being judgmental	5.63 (0.68)	6.43 (0.50)		4.98 (0.71)	6.45 (0.53)	
	Provide constructive feedback to IP team members	5.63 (0.48)	6.27 (0.49)		5.00 (0.70)	6.42 (0.55)	
	Express my ideas and concerns in a clear, concise manner	5.66 (0.64)	6.18 (0.74)		5.02 (0.69)	6.42 (0.55)	
Collaboration	Seek out IP team members to address issues	5.54 (0.57)	6.32 (0.43)	< 0.001	5.00 (0.77)	6.44 (0.55)	< 0.001
	Work effectively with IP team members to enhance care	5.39 (0.71)	6.30 (0.46)		4.98 (0.78)	6.49 (0.50)	
	Learn with, from and about IP team members to enhance care	5.48 (0.63)	6.43 (0.50)		5.11 (0.53)	6.46 (0.50)	
Roles and responsibilities	Identify and describe my abilities and contributions to the IP team	5.70 (0.46)	6.30 (0.46)	< 0.001	4.85 (0,89)	6.28 (0.60)	< 0.001
	Be accountable for my contributions to the IP team	5.84 (0.37)	6.29 (0.46)		5.11 (0.50)	6.42 (0.50)	
	Understand the abilities and contributions of IP team members	5.71 (0.46)	6.25 (0.44)		5.00 (0.67)	6.29 (0.51)	
	Recognize how others' skills and knowledge complement and overlap with my own	5.48 (0.89)	6.13 (0.47)		5.06 (0.66)	6.33 (0.47)	
Collaborative patient/ family-cantered approach	Use an IP team approach with the patient** to assess the health situation	5.57 (0.60)	6.30 (0.46)	< 0.001	4.94 (0.75)	6.37 (0.51)	< 0.001
	Use an IP team approach with the patient to provide whole person care	5.57 (0.57)	6.23 (0.43)		5.00 (0.75)	6.40 (0.49)	
	Include the patient/family in decision-making	5.55 (0.69)	6.23 (0.43)		5.08 (0.71)	6.45 (0.50)	
Conflict management/ resolution	Actively listen to the perspectives of IP team members	5.46 (0.55)	6.29 (0.49)	< 0.001	4.98 (0.71)	6.47 (0.52)	< 0.001
	Take into account the ideas of IP team members	5.39 (0.56)	6.27 (0.45)		5.06 (0.60)	6.42 (0.50)	
	Address team conflict in a respectful manner	5.75 (0.48)	6.41 (0.50)		5.15 (0.56)	6.49 (0.50)	
Team functioning	Develop an effective care*** plan with IP team members	5.04 (0.76)	6.25 (0.48)	< 0.001	5.08 (0.59)	6.38 (0.49)	< 0.001
	Negotiate responsibilities within overlapping scopes of practicum	5.32 (0.69)	6.30 (0.46)		5.05 (0.70)	6.31 (0.57)	

*Pair sample t-test was used to determine the significance, defined as p < 0.05, between pre and posttest of ICCAS score. SD: Standard deviation, IP: Inter-professional, ICCAS: Interprofessional Collaborative Competency Attainment Scale.

students has increased after using CIHOP in both simulation activity and home visit.

Discussion

Based on the measurement using this ICCAS instrument, the activity of IPE this time is effective in improving IPE competency, in which students are able to communicate, cooperate, and collaborate among health workers related to cases of disease and medication of the patients. This is in line with the aim of IPE learning, in which it focuses on patients that is done by inter-professional(s) of various health professions who have peculiar knowledge, skills, and ability in scientific disciplines [9]. ICCAS is a validated, reliable, and comprehensive instrument in predicting a meaningful result related to the response toward inter-professional competency achievement [10].

The response of apothecary and medical students toward the implementation of IPE is very reassuring as there is improvement from pre-test to post-test score [11]. This improvement is not only seen from the IPE competency but also from profession competency showed by the competency of involving patient in giving recommendation and decision. The competency of pharmacy care requires pharmacist-to-be to have awareness on patient oriented, safety, and preference.

IPE provides a good collaboration result among health workers to improve patient's outcome [12]. This good collaboration can be prepared by starting from education level in university based on the knowledge discipline and competency [9]. This result is supported by positive response from students during the IPE activity; "*By knowing each other since college, it will ease the collaboration skill in the work field later."* The improvement on mean score of conflict management/ resolution domain shows that IPE can suppress the emergence of conflict among professional health workers that is related to patient care in which it can distract the work efficiency and affect medical decision-making that can be detrimental to the patients [13]. The students' response toward conflict management is "*Doctor and pharmacist have perception in giving different dosage for patient, after discussing to seek out the solution together then the agreement is settled."* Students of apothecary and medicine are very enthusiastic with IPE activity and give positive testimony "*IPE is recommended to be often implemented for a better communication among health personnel."* The communication ability among health workers can be trained through IPE given since college aiming to improve self-confidence and better cooperation skill [14], as the following student's response "*I become more confident after having IPE with pharmacist and medical students."*

This research result is different from previous study in which role and responsibility domain have massive influence in IPE activity conducted by 2nd-year pharmacy and medical students [15]. Based on the qualitative response, some medical students feel that their academically ability in extracting problems and determining medication treatment in their third year was still lacking, so that they cannot provide argument and was only receiving suggestion from 5th-year apothecary students. Some apothecary students are also experiencing a gap between skills and knowledge. The difference in level of apothecary and medical students has possibly become the cause of less achievement in responsibility competency. The students are also giving some comments for IPE activity improvement as follow.

> "*Pharmacy students should collaborate with those who are in their 5th-year of college"*
>
> *"The series of activity is very positive and will be more exciting if we can have IPE with*

students from other profession of the same level"

The lowest score on role and responsibility domain from the survey result of apothecary students related to some roles of apothecary and medical students tends to be overlap for it digs up the similar problem. However, both pharmacist and doctor need the process of demographic and clinical extraction of patients, so it is not an overlapping role rather it arouses awareness that the patients' observation process should be done together. Joint visit is also efficient for patients.

Seen from the achievement of knowledge competency, the average score of students during the home visit simulation using IP is higher than without IP. This shows that IP program with experiential learning has positive impact toward knowledge competency attainment. The low score of students following IP is seen in some students who feel hesitate in confirming to the doctor-to-be. Two students got 20 points lower for IP simulation score than previous simulation practicum conducted independently without IP. This becomes understandable for CIHOP is their first experience in learning together with medical students. The score of home visit competency tends to be higher than the simulation score. During the home visit, students feel more relax because they have known each other and had experienced in simulation practice. Below is the students' response that supports this activity.

"*During the first prescription practice, I was really panicked to the fact that I had to confirm to the doctor*"

"*During the home visit, I just got to know the medical students"*

This paper has some limitations, for instance it was conducted to a limited number of respondents. Besides, this research was implemented to students of apothecary and medicine who were in different level, so that the mastery of knowledge competency is rather imbalance. This research was also conducted in a short amount of time, which was for about 2 weeks. However, this research has shown the effectiveness of IPE using experiential learning toward apothecary students and undergraduate medical students.

Conclusion

The IPE activity that was followed by apothecary and medical students using experiential learning significantly improves the achievement of knowledge and IP competency. The score of prescription simulation practicum and home visit has significantly improved after using IP approach. CIHOP significantly improves the ability of inter-professional collaboration that includes Communication, Collaborative, Roles and Responsibility, Collaborative Patient/Family-Centered Approach, Conflict Management/Resolution, and Team Functioning. The implementation of IPE using experiential learning can be applied on courses with a learning objective that allows the course to be packed in a joint activity.

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