

# An Educational Intervention of Interprofessional Learning in Community Based Health Care in Indonesia: What did We Learn from the Pilot Study?

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## Abstract

Interprofessional learning (IPL) in community based health care (CBHC) was a pilot model to promote interprofessional education and collaborative practice in Indonesia and to offer the opportunity for medicine, nursing, pharmacy, and public health students to have hands-on experiences in IPL in community settings. The purpose of this article is to describe the IPL program and its implementation in CBHC and to present the students' reaction towards the program. The study was conducted at the State Islamic University in Jakarta, Indonesia in 2012. Sixty two third-year students, 20 faculty members as tutors, 20 people as standardized patients (SPs) and 15 real patients volunteered and completed this program. Students attended a four-day workshop, a two-day simulation and practiced IPL for two months. The evaluation program applied a mixed-method design and showed that the success of the program was due to designing the program based on theoretical grounds in learning and social domains, applying various teaching methods (small group learning techniques, practice-based learning, and reflective practice) and providing a supportive environment for informal activities. The usefulness of this program was evident from a significant quantifiable improvement in student satisfaction. However, the high rate of student withdrawal from the program was the main issue as the program was not integrated into the curriculum. It needs support from university structures to handle the complexity of professional curricula and the boundaries between faculty/disciplines.

**Keywords:** evaluation program, educational intervention, interprofessional learning, community setting

Abbreviations:

IPE: Interprofessional Education

IPL: Interprofessional Learning

CBHC: Community based Health Care

SPs: Standardized Patient

## 1. Introduction

The scientific literature continues to advocate interprofessional collaboration (IPC) as a key component of primary care. Primary care services are provided, created, and configured to meet the healthcare needs of the patient population (Vachon, Désorcy et al. 2013). Similarly, several issues of health problems in developing countries such as the double burden of diseases, a shortage of health professionals, and low quality health services have also stimulated the development and implementation of interprofessional education (IPE) and collaborative practice around the world (WHO 2010).

In 2010, the WHO launched a strategy of "Framework for Action on Interprofessional Education & Collaborative Practice". This initiative is a continuation of the WHO's longstanding commitment to improve health and medical and other health professional education, through IPE (Barr 2010). The launching of this strategy was also in response to a movement for strengthening health systems based on the fundamentals of primary healthcare, which also aims to achieve health for all through primary health care (WHO 2010). IPE as *an occasion when two or more professions learn with, from and about each other to improve collaboration and the quality of care* (Barr 2002) was seen as a means to achieve primary health care for all.

IPE, the core of collaborative practice, has permeated widely in various institutions. Educational research on IPE has been carried out by various professions and has demonstrated the positive impact of IPL and collaborative practice among practitioners and the community (Mickan, Hoffman et al. 2010). Currently, despite the implementation of IPE for more than three decades, the development of IPE in developing countries is limited (Mickan, Hoffman et al. 2010). Unfortunately, there are only a few studies from institutions in developing countries related to IPE.

In Indonesia, the Ministry of National Education (MONE) officially launched the introduction of IPE two years

ago (Indonesia Ministry of Education 2010) but IPE remains debated among health educators and professionals in Indonesia, and it has not been implemented as a policy within the curriculum of health professional education in Indonesia. Therefore, it is necessary to develop a learning model that can provide useful information for the development of IPE in Indonesia. Development of an educational intervention for IPL in community-based healthcare (CBHC) is a great challenge and the first step toward promoting IPE in medical and health institutions in Indonesia.

This initiative preferred a CBHC setting for learning because (1) primary healthcare is the forefront of health services in Indonesia, (2) home care by nurses has become necessary in Indonesia due to increased life expectancy and the prevalence of chronic diseases, (3) students can learn about patient care management in integrated and holistic approaches, (4) and students can work with a large number of non-health professionals in the community such as paraprofessionals (social workers, educators, lawyers), community volunteers and indigenous workers (Islamic scholars, traditional birth attendants, non-registered nurses, etc) who have unique roles in supporting the health programs in Indonesia.

Therefore, the aim of this study is to evaluate the effectiveness of IPL in community-based healthcare by assessing the impact of this program on the achievement of students' interprofessional competencies and its implementation in community practice. However, in this paper, we present the IPE program and its implementation in CBHC and the changes in students' reactions.

## **2. An educational program of interprofessional learning in community based health care**

### **2.1 Selection of an IPE program**

The literature review was undertaken to identify the IPE concepts in primary care settings that have been previously utilized and are most relevant for the current situation in Indonesia. Previous studies suggested that the implementation of IPE programs in primary care settings need to consider some key elements i.e., (1) IPE intervention should be based not only on educational theory, but also on an applied theory of psycho-social learning; (2) implementation of various learning methods in the program should be in accordance with the achievement of each learning objective; (3) the program should be executed as a longitudinal study; and (4) various evaluation tools should be used to evaluate the effectiveness of the program and assess the achievement of the interprofessional competencies among learners (Barr, Koppel et al. 2005, Oandasan and Reeves 2005, Clifton, Dale et al. 2006, Barr, Helme et al. 2011).

### **2.2 Development of the program**

The Community-based Interprofessional Collaboration (COMIC) program was an educational program of IPL in CBHC to promote IPE and collaborative practice in Indonesia. This educational program was integrative learning that combined the development of knowledge, attitude, skills and practice (work based) to support the success of IPE. This program provided the opportunity for students to have hands-on experiences in collaborative practice in the community through home care services. It attempted to incorporate the learning and practice in a longitudinal program to obtain a complete and comprehensive understanding of the interprofessional and collaborative practice for students and faculty members.

In the current dynamic health care environment, practitioners are required to have the ability to self-direct learning, develop critical thinking, apply reflective practice, and work in groups [Harden, 1998; Parsell Bligh, 1998]. Traditional teaching such as lectures in classroom is not adequate to achieve those competencies. Active, applicable, and self-reflective learning has been proven to be capable of achieving those outcomes. Therefore, in designing the curriculum of this program, we used various learning theories and psycho-social domains (Barr, Koppel et al. 2005), multiple teaching methods, and applied several realistic scenarios and cases as learning tools. The program consisted of three phases as follow (1) cognitive formation, (2) behavioral formation for team interactions, and (3) formation of collaborative practice skills. Each phase is interrelated and underpinned by the various theories and used different teaching methods to achieve the learning objectives. The total number of days for all activities was 10 days in three months and all activities were held on Friday afternoons and Saturdays.

### **2.3 Objectives of the program**

The principle of this program was to test this innovative model of education combined with home care service in CBHC. The evaluation was designed to provide information on the strengths and weaknesses of this model to assist future development. The objectives of the program are that after being involved in this program, students will:

1. Understand the benefit and importance of interprofessional education related to their profession
2. Understand the roles of their own profession and other professions in the care of patients
3. Develop teamwork skills to treat patients in the community
4. Improve communication skills to communicate with students from other backgrounds
5. Improve communication skills to communicate with patient and patient's family members
6. Have knowledge and skills to assess patient's problems with the home care service, and

## 7. Develop behaviors for collaborative practice in the home care service.

### 2.4 Recruitment and Training

#### 2.4.1 Students

Students in the third year of their program were recruited as volunteers by filling out application forms distributed in each class. The class sizes were medicine 49, nursing 38, pharmacy 45 and r public health 67. From the volunteers, 20 students were selected randomly from each discipline, for a total of eighty students.

#### 2.4.2 Real patients

In the interprofessional practice session, we involved 25 real patients who suffered or had a chronic disease such as diabetes mellitus, hypertension, or chronic obstructive pulmonary disease. In the preparation stage, a faculty member and a staff member of Primary Health Center together determined a village and patients for this program, and conducted a visit to the house of a patient who was willing to participate in this program. This visit was important to explain the program, the roles of patients and family members during the program and to obtain consent to participate.

#### 2.4.3 Tutors

Tutors who participated in this program were volunteers and they were involved in a two day workshop of IPE training for tutors. From the thirty faculty volunteers, 22 tutors attended the workshop. The workshop delivered modules of IPE and collaborative practice concepts, communication skills, respect for each other, professionalism, team work skills, the role as a tutor, coach and role model, social culture adaptation and evaluation of student achievement. Tutors were involved actively in SP's training (tutor acted as a student in role plays), simulation sessions and patient visit activities. In this program, we divided tutors into several groups that consisted of tutors from three or four disciplines (medicine, nursing, pharmacy, and public health) to supervise, monitor and evaluate each student and group during the simulation session, debriefing activities and patient visits.

#### 2.4.4 Simulated or standardized patient (SP's)

We invited twenty people who live near the campus area to participate in this program as SPs. They had varied backgrounds such as educators, pensioners, private workers, and housewives. Training for SPs was held in a two- day workshop and they were trained on how to act by both verbal and body language as well as how to provide the relevant answers or information related to the question(s) asked by students. In addition, we had two stages of the SPs training i.e. in the first stage, the SPs practiced using the scenario of the disease that he/she had, and in the second stage, SPs followed the scenario constructed by the program. During the training, SPs practiced role-plays with other SPs and with tutors. One day before the simulation session, the SPs did a practice review using the scenario that was used in the simulation session.

### 2.5 Supporting the learning

#### 2.5.1 Development of the scenario

The simulation session was driven by a case (case-based concept). Researchers, tutor, and other faculty members constructed the scenario. For the simulation activity, we chose a case of diabetic foot ulcer. It was chosen because (1) currently, diabetes mellitus is the most common chronic disease in Indonesia and (2) there are multi determinant factors influencing this case so that the students can analyze it from the viewpoint of each profession and solve this case comprehensively.

#### 2.5.2 Supportive learning environment

In IPL, the informal and hidden curriculum is an important domain so it is important that the learning process occurs in a realistic environment, and is interactive and student-centered (Nordquist, Kitto et al. 2011). Therefore, this program created a supportive environment to sustain the learning process by setting up the schedule of tutors on duty (only every Friday), providing adequate facilities and infrastructure such as a classroom and equipment, books, computers, CD-learning and free access to wireless-internet, all of which were available on weekdays and Saturdays.

### 2.6 Implementation program: learning methods

The program applied several learning methods to achieve the objective of the program.

#### 2.6.1 Interactive learning

Interactive learning means that students are active participants in the learning process. In this learning model, students are encouraged to control their learning and to construct meaning. Students put together knowledge and skills by connecting with information and experiences provided by the teacher, and are engaged both intellectually and emotionally in the learning process. Feedback, reflection and dialogue are integral components of interactive learning (Sessoms 2008). All modules were delivered in a four- day workshop by implementing various learning methods such as interactive lectures, group discussions, role-play and problem solving.

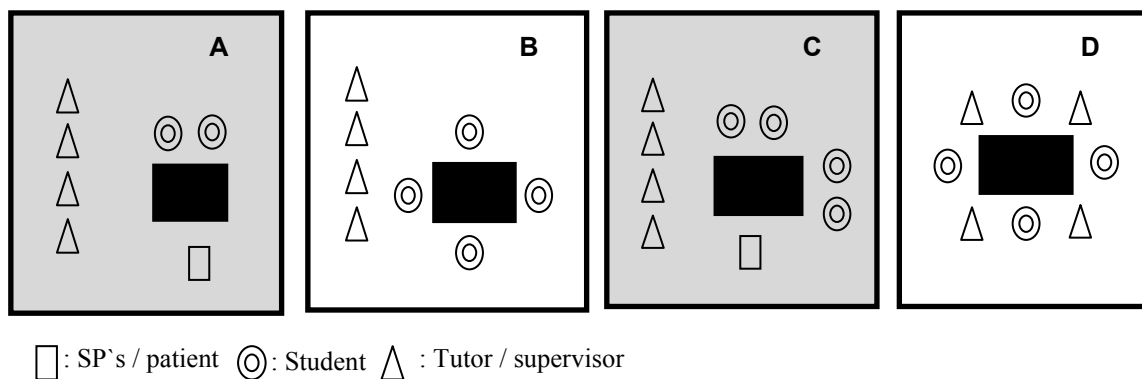
#### 2.6.2 Ice-breaking activity and working in groups

As learning that units students from various disciplines, the early stage is a very important phase of IPE implementation. Many studies suggest that students who are involved in IPE learning feel frightened and

uncomfortable (Lumague and et al. 2006) and tension would arise when students met each other for the first time (Lumague and et al. 2006)] due to the presence of differences in social-culture, professions and roles, as well as educational background. In this study, the strategy to reduce tension among members of the team and help participants in the process of social adaptation was the use of an ice-breaking activity with various learning methods such as role-plays, team-building activities and working in groups from the beginning.

### 2.6.3 Simulation model of IPE

To achieve the objectives in the second phase, learning by simulation was employed. The model of IPL simulation in this program was based on the model of a patient visit to primary care services in Indonesia (Figure 1). In this simulation, we introduced a new initiative to involve the disciplines of pharmacy and public health in the home care services model because this services usually only involves physicians, nurses or midwives. The simulation session engaged students, tutors, and SPs and was guided by a scenario.



Description of the project process for both simulated and real patient visits.

*Session A:* Medical and nursing students visit a patient's home to interview a patient and his/her family members and carry out a physical examination using a family record form. Tutors from each discipline observe and evaluate using tutor's form.

*Session B:* Medical and nursing students discuss with other group members about the patient's and family members' data that was collected in the first session. Their discussion was guided by a discussion form. Tutors observed and evaluated students' activities during group discussion. After the discussion, the group made conclusions about the patient's problems, the cause of the problems, the need for further data, and recommendation(s) for patient/family members.

*Session C:* All members visit the patient's home to present their understanding of the patient's problems and the group's recommendations. Tutors observe and evaluate group's activities during this session.

*Session D:* This session is called the debriefing and reflection session. Students and tutors discussed the findings from session C and the group's recommendation. The tutor's role was to guide students' reflection about their learning.

### 2.6.4 Practice in real setting

The third phase constituted an interprofessional practice model in which each group visited a real patient at his/her home. Patient visit activities were carried out at least three times in two months. The tutors and a community volunteer (cadre) accompanied each group on each visit. This was done to eliminate harm to the patient or his/her family members during these activities.

In the first patient visit, medical and nursing students interviewed the patient and his/her family members using the family record form. After interviewing, they performed a general physical examination including measurements of blood pressure, body temperature, body weight and height, and other specific physical examinations if they found abnormalities such as wounds, ulcers, tumors, or other abnormalities. In addition, students collected information on psychosocial and environmental factors. Medical and nursing students presented and discussed their findings with other members. A student group was allowed to visit the patient more than once in this activity if the data was not sufficient or they needed to confirm some information. For re-visiting, each group made an appointment with the patient and all members of the group were allowed to visit such a patient; however this visit was for interview purposes only.

The second patient visit was intended to convey information about the patient's problems and the group's

recommendations for the patient and his/her family members. The third patient visit was aimed to follow up the patient's condition and evaluate the impact of the group's recommendation. All members of the group visited the patient and his/her family members on both the second and third patient visits. At the end of this phase, each group made a report that analyzed the patient's problems and determinants of health, and the impact of the group's recommendation. It also included students' self assessment.

#### 2.6.5 Debriefing and reflection process

Previous studies have shown that reflection and debriefing activities were considered useful for students to get the most from their education (Schön 1983, Kolb 1984). Applying reflective activities in the debriefing process helped students to link theory to practice, to think critically and to discuss how to perform professionally in a complicated situation (Schön 1983, Jeffries 2007). Although the learning process in this program used various methods (such as interactive lecture, simulation and task training in context and repetition), the most meaningful learning process occurs when deep insight is created explicitly through reflection during debriefing (Dreifuerst 2009).

Debriefing and reflection activities in a group were carried out three times as follows (1) after the first visit, (2) before the second visit, and (3) after the third visit. Each debriefing session was attended by three student groups and was facilitated by a tutor team from four disciplines. During this session, the tutor guided students to present and discuss their group's findings from the first and second visits, and the group's planning and recommendations for the patient and his/her family members. In addition, students were encouraged to describe the difficulties encountered during visits and group activities. This process was important to assist students in IPL, such as the process of communication among individuals and groups, team dynamics and performance, reducing conflict within a team, and respecting others professional roles as well as to integrate students' knowledge, attitude and skills.

#### 2.6.6 Informal activities

Previous studies showed that informal activities were the most important factor for the success of IPE interventions and for supporting the learning process in IPE (Nordquist, Kitto et al. 2011). Therefore, we set the program schedule to be flexible, to provide facilities for this activity on weekdays and Saturdays, and encouraged students to maximize the use of free video conferencing as a medium for discussion among students or with tutors.

### 2.7 Assessment tools and evaluation framework

#### 2.7.1 Assessment tools

A psychometric item analysis and validation scale were employed for the self-perception scales used in this study including readiness for interprofessional learning (RIPLS) scale (Parsell and Bligh 1999), group atmosphere scale (Shah and Jehn 1993), intergroup conflict scale (Jehn and Mannix 2001), satisfaction scale (Brehm, Smith et al. 2001, Ruona, Leimbach et al. 2002), and role perception (modified RPQ) scale (MacKay 2004). All scales were written in English and were translated them into the Indonesian language by applying a cross-cultural adaptation process (Guillemin, Bombardier et al. 1993) to obtain an adapted version with good reliability and validity. The intragroup conflict, group atmosphere, satisfaction and modified RPQ scales used a 7-point Likert-type scale (1=very strongly disagree, 4=neutral, 7=very strongly agree) and the RIPLS scale used a 5-point Likert-type scale (1=strongly disagree, 3=neutral, 5=strongly agree), to indicate the strength of agreement.

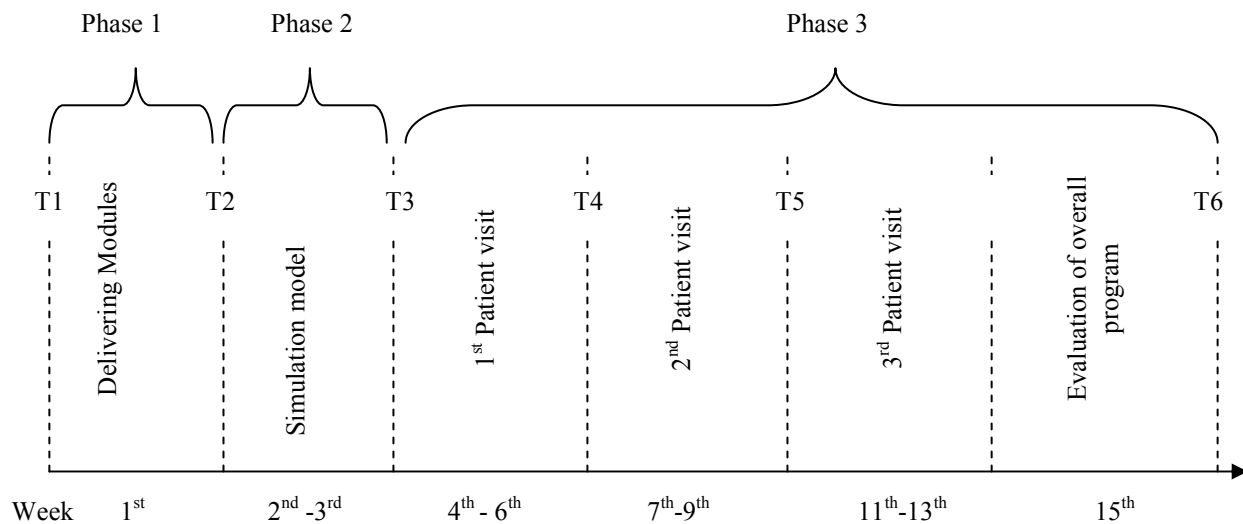
We conducted the survey in 2011 and distributed 800 questionnaires among the first to third year students from four disciplines (medicine, nursing, pharmacy, and public health) to meet the requirements of factor analysis, and we analyzed 755 complete questionnaires. By using explanatory factor analysis and confirmatory factor analysis, all scales produced good internal consistency (Cronbach's alpha > 0.8), goodness of fit index more than benchmark and good convergent validity (composite reliability > 0.7 and average variance extracted >0.5) (Hair 2005).

We developed a set of 22 true-false questions to test students' knowledge and a check-list sheet to assess students' skills by direct observation (Bayerl 2008). We also distributed a questionnaire about the level of students' agreement (from 1=lowest to 10=highest) regarding any implementation of the modules and activities in this program and an open-ended questionnaire to obtain the qualitative data on benefits, barriers, strengths and weaknesses of the COMIC program as well as the possibility of implementing this program at our faculty.

#### 2.7.2 Evaluation framework and data analysis

The timeframe of intervention program activities and data collection are described in Figure 2. Collecting data for the evaluation of the program was achieved through several methods as follows (1) a written exam to assess knowledge; (2) students' self assessment about satisfaction and benefit from the program, team performance, readiness for IPL, and role perceptions; (3) assessment of student's behavior by tutors with direct observations using a check-list form during simulation session, patient visits, discussion and debriefing activities; (4) observation of students and tutors activities through video recording; and (5) written comments from students

and tutors about the program, benefit and barrier for individual, patient and institutions. Quantitative data were analyzed using SPSS for Windows version 16.1 (IBM Corporation, Armonk, New York). Alpha error was set at 5%. Changes in overall mean scores of satisfaction scale and RIPLS scale in three periods of measurement were analyzed using repeated-measure ANOVA (RM-ANOVA). The Bonferroni post hoc test was conducted, when appropriate, to examine the main time factor means between T3\*T4, T3\*T5 and T4\*T5. The effect size was measured by using the Cohen's effect size (Cohen 1988). In this article, we only discuss quantitative data of students' satisfaction and qualitative data (open-ended questionnaire).



**Figure 2 Time Frame of Intervention Activities and Evaluation Program**

### 2.8 Ethical considerations

All students, tutors, SPs' and real patients gave written and verbal informed consent after receiving information about this study both in writing and verbally. All interviews and information about patient/family members were confidential and are used only for activities related to this program. The Ethics Committees of both the University of Tokyo and State Islamic University, Syarif Hidayatullah Jakarta, Indonesia, approved the research.

### 3. Result: Evaluation of the implementation program

The COMIC program was implemented during ten days over a three month period not included informal group discussions and re-visiting the patient's house. Only 62 (77.5%) students completed this program and the proportion of female participants (n=47, 75.8%) was higher than male participants. Students who participated in this study were from medicine (n=15), pharmacy (n=15), public health (n=16), and nursing (n=16) disciplines. Likewise, tutors (n=20), SP's (n=20) and real patients (n=15) were involved in this program.

#### 3.1 Modules of COMIC program

All modules and activities were carried out according to the program's plan. Modules and activities for the first and second phases were employed following the schedule. In the third phase, except for the first patient visit, the schedule of the second and third patient visit varied according to the convenience of the patient and family. Likewise, some groups conducted informal group discussions and re-visited the patient's house on Sunday.

To evaluate the quality of COMIC modules, the participants were requested to fill in a questionnaire of module quality and to rate various attribute of the workshop content and teaching method (1=poor to 10=very excellent). Table 1 illustrated that the students were more interested in and gave the highest scores to the activities of "patient visit", followed by the "game of group dynamic", "simulation of IPE practice" and "game of team building". Students gave lower scores for the module of "lecture about social culture adaptation" and "lecture about IPE and collaborative model".

Table 1 Mean score of students' responses for each learning method in COMIC program

Learning method	Student's responses	
	Mean	SD
Patient visit	8.45	1.28
Game of group dynamic	7.98	1.54
Simulation of IPE practice	7.98	1.26
Game of team building	7.97	1.48
Role play of interpersonal communication	7.97	1.31
Lecture about professional role and professionalism	7.87	1.35
Group discussion (after home visit)	7.76	1.16
Group discussion (after simulation model)	7.58	1.24
Lecture about IPE and collaborative model	7.56	1.17
Lecture about social culture adaptation	7.53	1.24

### 3.2 The impact of the program on students and constraints during implementation

Students were asked to respond to six statements related to their satisfaction with this program and Table 2 showed students' satisfaction in three periods of measurement. The mean of students who gave responses to each item of the satisfaction questionnaire ranged between 5.24 (after 2<sup>nd</sup> patient's visit) to 5.92 (after simulation). These results indicated that the students were satisfied with the learning experience in this program. The highest scores were for the items "I learned something that helped me in my present work" and "the co-learning experience provided me with new ways of thinking about my work" ..

Table 2 Mean score of students' satisfaction in three periods of measurement

Items	After Simulation		After 1 <sup>st</sup> patient's visit		After 2 <sup>nd</sup> patient's visit	
	Mean	SD	Mean	SD	Mean	SD
I learned something that helped me in my present work.	5.92	0.73	5.73	0.77	5.40	0.59
The co-learning experience provided me with new ways of thinking about my work.	5.87	0.71	5.71	0.76	5.45	0.64
Co-learning was a valuable part of the overall curriculum.	5.71	0.91	5.53	0.86	5.31	0.62
I would recommend this experience for everyone in health care education.	5.82	0.95	5.56	1.11	5.24	0.99
My time is well spent.	5.81	0.79	5.52	0.94	5.34	0.68
I would recommend this experience to others in my program.	5.63	0.83	5.50	0.92	5.40	0.76

Figure 3 shows the graph of students' satisfaction level in three periods of measurement. The mean total score of students' satisfaction was 34.76 (T3), 32.15 (T4) and 33.55 (T5). RM-ANOVAs showed that the assumption of sphericity by the Mauchly's Test of Sphericity was satisfied,  $\chi^2(2) = 0.952, p = 0.265$ . There was a statistically significant effect in the satisfaction score for time ( $F = 10.21, d.f. = 2, p < 0.0001$ ) but there was no significant effect in the satisfaction score of the discipline\*time interaction ( $F = .28, d.f. = 6, p = 0.945$ ). The Bonferroni post hoc test was conducted and showed that the difference in mean student satisfaction score between T3 and T4 as well as T4 and T5 was statistically significant ( $p < 0.0001$  and  $p = 0.029$  respectively), however an insignificant result was detected between T3 and T5 ( $p = 0.381$ ). The effect size of the satisfaction score for time ( $d = 0.157$ ) and the effect size of discipline\*time interaction ( $d = 0.015$ ) were small effects.

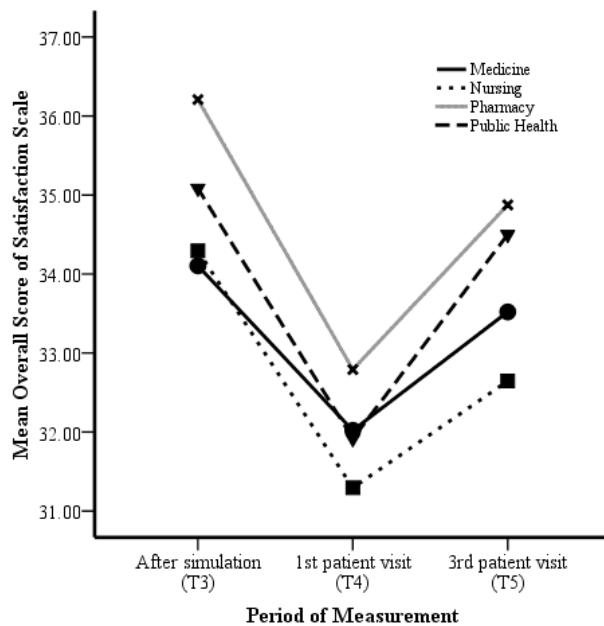


Figure 3 Mean Overall Score of Satisfaction Scale in Three Periods of Measurement

Students gave their written opinions about the competencies required for performing home care, as well as benefit and barriers during involvement in this learning. With respect to the COMIC program, 59 students (95.16%) agreed that this program should be integrated into the curriculum because the students gained new knowledge and skills, learned to solve the patient’s problem in an integrated and comprehensive way, and better understood their own profession and other professions.

Nevertheless, students also dealt with barriers such as schedule conflicts for meeting with group members (the most important barrier) during this program. Communication between professions, relationship with other professions, and how to manage a team were also considered hurdles in this program. At the beginning of the program, students also dealt with traits of arrogance and bossiness, difficulty in communicating with other professions, and the tight program schedule.

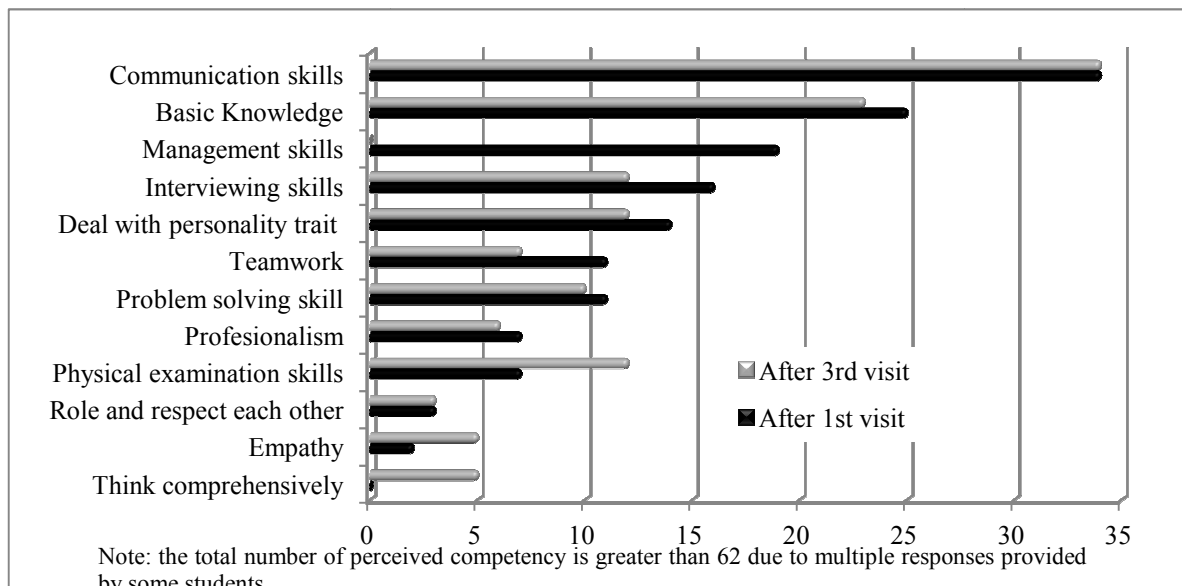


Figure 4 Students' opinions about the competencies required in community setting

Figure 4 shows students’ written responses towards the required competencies in a real setting and can be summarized to show that communication skills, basic knowledge, problem solving skills and the attitude of professionalism were the competencies required in both the first and third patient visits. Specific competencies were required during different phases. For example competency of " management skills" existed only in the first



visit while competency of "think comprehensively" was necessary on the third visit. How to deal with certain individual traits (arrogant, bossy), how to work in team and interviewing skills were important competencies that were needed in the first visit but those skills were not prioritized on the third visit. The evidence suggested that students required some specific competencies when applying the concept of IPE learning at a particular phase.

#### 4. Discussion

In this article, we present the implementation of an initial program of IPE in Indonesia and a mixed method evaluation of the program overall. This module afforded an opportunity for students and faculty members of FHMS to learn about IPE from experience. The program was successfully implemented and it showed a positive impact on students. The difference of percentage among female and male students in this study did not affect the success and effectiveness of IPE program. The students' satisfaction in attending this program was significant, even though the Cohen's effect size was small. Based on the open ended questionnaire, students stated that the program provided a valuable experiences for students and their future careers.. In addition, this activity also built in new knowledge and skills through the exchange of information and experiences as well as shared learning (Barr, Koppel et al. 2005).

The level of students' satisfaction in attending this program was good and it showed that the program provided a valuable experience during their study and for their future careers. In this program, the mean score of student satisfaction was lower after the first patient visit than the mean score after simulation and after the third patient visit. This indicated that the first patient visit is a critical point of IPE learning in the COMIC program since the first patient visit was the first experience for students to both encounter and apply their knowledge directly on real patients.

In addition, the reduction of student satisfaction was influenced by (1) the complexity of patient problems that included medical and psycho-social problems, and the fact that it is difficult for groups to devise a solution since this activity was the first experience of interacting with a real patient; (2) the difficulty of arranging meetings because of the crowded course schedule; (3) the difficulties encountered in making appointments with patients during weekends as sometimes the patient was only available on weekdays when students have a busy schedule.

The COMIC program was constructed by integrating three components of the development of interprofessional teamwork including social, interprofessional and educational preparation for interprofessional team processes (Billups 1987). For the educational program, the program utilized various learning theories and social domains as well as multiple learning methods (such as interactive learning, problem solving, simulation and practice in real setting) (Oandasan and Reeves 2005). Students were more interested in active learning methods such as simulation, role play and practical sessions compared with the interactive lectures (Table 1). For social and interprofessional processes in group development, the program employed working in small group, an ice-breaking activity, and a reflective activity (Barr, Koppel et al. 2005, Oandasan and Reeves 2005). The program used multiple methods, as it is known that more than one method is needed to respond to the diverse needs of students (Barr, Koppel et al. 2005). In addition, the success of this program was also supported by non-classroom interactions with tutors, peer group interaction and extracurricular (non-scheduled) activities, and was consistent with previous studies in which informal activities were important factors for the success of IPE program (Nordquist, Kitto et al. 2011).

The role of the tutor is an important factor (Gilbert, Camp II et al. 2000, Freeman, Wright et al. 2010)] for the success of this program (Weidman and Twale 2001). Aside from being tutors, facilitators, coaches or mentors (Steinert 2005), another role is to provide the constructive understanding and positive learning for collaborative practice as a role model (Cooper, Braye et al. 2004). For complex learning like IPE, students need a role model to understand some elements that they may have not been exposed to before, such as respecting other professions, how to discuss with students from different disciplines or how to work in a team.

The students' written responses showed that students need certain knowledge or special skills at each phase of activity (Figure 4). As shown in Figure 4, for implementation of IPE in the future, it is important to prepare the specific modules to enrich students' insight and improve students' skills. Reflection during debriefing sessions assisted students' reflections on their limitations and served as a medium for students to discuss issues with the tutor. However, reflection alone is not enough. The faculty needs to arrange a special schedule and module to address the students or groups' needs that cannot be obtained through self-learning.

#### Implication practice and limitation of study

Although the program was successful in its implementation and had a positive impact on students and faculty, there are issues that should be considered for further implementation.

*First*, the high rate of student withdrawal from the program illustrates the need to implement IPE programs in a structured fashion in the curriculum. It requires a university structure that actively fosters collaboration across

departments and faculty/discipline boundaries (Gilbert, Camp II et al. 2000).

*Second*, the involvement of a tutor group from four disciplines to observe each student group during the patient visits and debriefing sessions needs to be taken into consideration if the number of faculty staff members are limited. The facilitator may not need to be present all the time, but every student must have a professional of the same profession to discuss with and to get feedback from.

*Third*, learning activities that support students' needs in the ongoing activity should be provided, because the students' responses stated that they required specific knowledge or skills at particular phases during this intervention. The students who were involved in this program were third-year students and they had never treated real patients.

*Fourth*, the implementation of IPE program that involves patients either in a hospital or community needs to consider the selection of patients' problems and the educational level of students who will be involved in the program. A gap or imbalance between those factors could lead to conflict in groups and might eventually interfere with the learning process.

*Five*, a benefit of the program is that the COMIC program has made a breakthrough to strengthen health services in primary health care in Indonesia because this program has directly involved public health and pharmacy professions as part of the medical team in the management of patients. Until recently, the medical team usually consisted only of doctors, nurses, or midwives in home care services. Further research is needed to analyze the effectiveness of the program in improving the quality health services.

## 5. Conclusion

The COMIC program was successfully implemented and was demonstrated to be effective in developing insight, knowledge, attitude and skills towards interprofessional education and collaborative practice among medical and health professional students. As complex learning, IPE, in its implementation, needs a comprehensive learning approach, various teaching methods, proper learning strategies and the support of university structures to handle the complexity of professional curricula and the boundaries between faculty/disciplines.

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## Declaration of interest

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