

博士論文

Evaluation of interprofessional learning in community-based
health care for medical and health professional students in Indonesia

(インドネシアにおける医療系学生のための
地域基盤型多職種連携学習プログラムの評価)

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Abstract

Objective: Community-based interprofessional collaboration (COMIC) programme is a pilot model of interprofessional learning (IPL) in community-based health care (CBHC) to promote interprofessional education in Indonesia and provide the opportunity for medicine, nursing, pharmacy, and public health students to acquire hands-on experiences of IPL in community settings.

Methods: First study was psychometric analysis and applied a cross sectional design. First study was conducted in 2011 for validating of team performance scale (involving 302 students) and in 2012 for validating of readiness for interprofessional learning scale (RIPLS, recruiting 755 students). All scales were translated into the Indonesian language through cross-cultural adaptation process. The psychometric properties were analyzed by both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Second study was the implementation of COMIC programme. This study was employed in 2012 from March to July and eighty of 3rd year students participated in this programme. All studies were carried out at the State Islamic University in Jakarta, Indonesia. In the second study, students attended a four-day workshop, a two-day simulation session and practiced IPL for two months. A mixed method design and Kirkpatrick's evaluation were implemented to evaluate the effectiveness of the programme.

Result: First study: CFA resulted in a fit measurement model with satisfactory reliability (alpha coefficients >0.7), construct validity and indices of goodness of fit (χ^2/df , GFI, TLI, CFI, SRMR, RMSEA) for conflict in group (CIG), atmosphere in group (AIG), and RIPLS.

Second study: The study demonstrated a significant positive impact on the students' satisfaction (Level 1), knowledge, attitude, and skills (Level 2), the ability to transfer students' competency in practice (Level 3) and positive impact for organization (Level 4A).

Conclusion: Overall, an initiative model of IPL in Indonesia was successfully implemented and generated positive experiences for students and tutors.

Keywords: health professional education, medical education, cooperative behavior, interprofessional learning, programme evaluation

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List of Abbreviations Used

IPE	:	Interprofessional Education
IPL	:	Interprofessional Learning
IPC	:	Interprofessional Collaboration
CBHC	:	Community-based health care
CHC	:	Community Health Center
COMIC	:	Community-based Interprofessional Collaboration
WHO	:	World Health Organization
FMHS	:	Faculty of Medicine and Health Sciences
SP	:	Simulated patient
AMOS	:	Analysis of moment structures
EFA	:	Exploratory factor analysis
CFA	:	Confirmatory factor analysis
SEM	:	Structural Equation Modeling
MVA	:	Missing value analysis
MCAR	:	Missing completely at random
AVE	:	Average Variance Extracted
CR	:	Construct reliability
SCC	:	Square of construct correlation
GOF	:	Goodness of fit
TLI	:	Tucker-Lewis Index
NFI	:	Normed Fit Index
CFI	:	Comparative Fit Index
GFI	:	Goodness of Fit Statistic

RMSEA	:	Root Mean Square Error of Approximation
SRMR	:	Standardized Root Mean Square Residual
AIC	:	Akaike Information Criterion
RIPLS	:	Readiness for interprofessional learning scale
TWC	:	Teamwork and collaboration
NPI	:	Negative professional identity
PPI	:	Positive professional identity
AIG	:	Atmosphere in group
TR	:	Trust
RO	:	Respect each other
OP	:	Open discussion
CIG	:	Conflict in group
RC	:	Relationship conflict
TC	:	Task conflict
PC	:	Process conflict

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Chapter 1

Overview of Study

This thesis describes the research process undertaken to comprehensively understand interprofessional learning (IPL) and collaborative practice within the context of undergraduate medical and health professional students. The focus of this research is IPL and collaborative practice in community-based healthcare (CBHC) where groups of students from various disciplines plan together to manage a patient through home care services. This study involved students from medicine, nursing, pharmacy and public health, working with patients and their families in a three-month period of IPL and practice.

1.1 Interprofessional Education (IPE)

1.1.1 Introduction

Interprofessional education (IPE) has emerged as a strategic curricular response to prepare practitioners who are able to face the dynamic healthcare environment, the complexity of health problems and demands of professional-quality performance (1). Many factors contributing to changes in healthcare have driven the need for different patterns of health service management with the aim of producing effective health services that benefit patients. The characteristic of the management of health services required as aforesaid is the integration of services, conducted collaboratively (with various multi-disciplinary interactions) and through team working (2).

Therefore, medical and health institutions are challenged to produce practitioners, who are adaptable, flexible, good team workers, able to collaborate effectively, and have high interpersonal and professional skills (2). A strategy to achieve those objectives is the

introduction of IPE at both pre-licensure and post-licensure stages, through which this strategy produces a new practitioner who has the knowledge, attitudes, and skills to confront and overcome a healthcare environment that is both challenging and dynamic (2, 3).

Currently, IPE has permeated widely in various institutions and several studies of IPE initiatives have demonstrated a positive effect not only for practitioners, but also for patients and organizations (such as educational institutions, health services, and government) (4).

Several issues of health problems in developing countries such as double-burden diseases, shortage of health professionals, and low quality of health services have also stimulated the development and implementation of interprofessional education (IPE) and collaborative practice around the world (3). In addition, increasing prevalence of chronic diseases, an aging population, and complexity of health problems have led to a shift to community-based care. Several IPE programmes have promoted the home care setting or community-based care as an ideal learning experience for health professionals' students to develop their knowledge, attitude and skills concerning IPL and collaborative practice (1). The scientific literature continues to advocate interprofessional collaboration (IPC) as a key component of primary care. Primary care services were provided, created, and configured to meet the healthcare needs of the patient population (5). Much evidence showed that running IPE in home care settings played a significant role in developing the understanding of the concept of teamwork and working in a multidisciplinary setting (6), was a valuable programme in promoting IPL (7), and helped students to understand patient centered care and the social determinants of health (8).

The health report, Health Professions Education: A Bridge to Quality, released after the Health Professions Summit at the Institute of Medicine in 2002 revealed that physicians, pharmacists, nurses, and other health professionals were inadequately prepared to provide the highest quality of care for the patient. They concluded that the five core competencies needed

to achieve this in the 21st century included: 1) provide patient centered care; 2) work in interdisciplinary teams; 3) practice evidence-based medicine; 4) focus on quality improvement; and 5) utilize information technology (9).

In 2010, WHO launched a strategy of "Framework for Action on Interprofessional Education & Collaborative Practice" and this initiative is also a continuation of WHO's longstanding commitment to improve the health and medical education, as well as other professions through the IPE (10). 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 (3). IPE is *an occasion when two or more professions learn with, from and about each other to improve collaboration and the quality of care* (11) was seen as a means to achieve it.

In addition, in recent years, the numbers of people with complex health needs are increasing. This condition raises the greater demands on the quality health services and the qualified health professionals (12). Team care has been recommended as a means of meeting these needs (13) as it is expected that a healthcare team will be more effective to solve health problems than an individual, as well as the teamwork and the collaborative practice are the necessary tools in handling both individual and community health problems. This situation pressed on the health providers to be able to collaborate with other professions and conducting collaborative practice. Thus, health providers who capable to collaborate with other professions and working in a team are needed, and the importance of interprofessional teamwork is becoming increasingly recognized (14).

Interprofessional teamwork is defined as "a collaborative interaction among interprofessional team members to provide quality, individualized care for patients" (9). To develop practitioners who can work effectively on a team, they should learn and be exposed

to teamwork activities during their training. However, working in a team is not a simple task, particularly when working with different professional backgrounds.

Becoming an effective team, each team must undergo the group development process (15). It is known that the process of formation and development of a team in IPL does not necessarily occur in sequence through the usual phase (16, 17). Likewise, the process of team development is a series of multilevel, overlapping and intertwined occurrences. It is a longitudinal process that requires building an interprofessional team (17).

1.1.2 Interprofessional education (IPE): Definition and evidence

It is widely understood in the literature that the prefixes of inter- and multi- are used interchangeably when referring to professional practice and education (18, 19). Many researchers, educators or organizations have attempted to formulate the definition of interprofessional education (IPE). Miller (2001) defines IPE as different professions learning about topics of mutual interest, rather than about each others' roles(20). Multiprofessional education - sometimes called shared learning or common learning (21) is where one or more students or professionals learn alongside one another.

Currently, much of the original literature referred to the IPE that was formulated by Barr (2005). Barr et al. (2005) define IPE as *'Occasions when two or more professions learn with, from and about each other to improve collaboration and the quality of care'*(22). Barr et al.'s definition has become the most accepted one across disciplines. The focus is on the intended outcome of the process, to enhance collaboration between professionals, in contrast to multidisciplinary education, which simply brings different professions together in the classroom. The definition of IPE shows that its implementation into the curriculum of health professions education will result in certain competencies (23).

Hammick et al. (2009) summarized competencies for being an interprofessional practitioner as:

- (1) Knowledge: understanding the role and working context of other practitioners and beginning to identify how these interrelate; recognizing the range of knowledge and skills of all other colleagues; and understandings the principles and practice of effective teamwork;
- (2) Skills: applying sound written and verbal communication methods with colleagues from other work settings; indentifying situations where collaboration was helpful or essential; working collaboratively with service users and carers; and using IPL in work settings;
- (3) Attitudes: appreciating the value of interprofessional collaboration, acknowledging and respecting others' views, values and ideas (24).

Table 1 Definition of Terms

Term	Definition
(Uni)Disciplinary	One provider working independently to care for a patient. There is little awareness or acknowledgment of practice outside one's own discipline. Practitioners may consult with other providers but retain independence.
Multidisciplinary	Different aspects of a patient's care are handled independently by appropriate experts from different professions. The patient's problems are subdivided and treated separately, with each provider responsible for his/her own area.
Interdisciplinary / interprofessional	The provision of health care by providers from different professions in a coordinated manner that addresses the needs of patients. Providers share mutual goals, resources, and responsibility for patient care. The term interprofessional is used to describe clinical practice, whereas the term interdisciplinary is often used to describe the educational process. Either term may be used when referring to health professions education and practice.
Interdisciplinary/interprofessional education	An educational approach in which two or more disciplines collaborate in the teaching-learning process with the goal of fostering interdisciplinary / interprofessional interactions that enhance the practice of each discipline.
Transdisciplinary	Requires each team member to become familiar enough with the concepts and approaches of his/her colleagues to "blur the lines" and enable the team to focus on the problem with collaborative analysis and decision-making.

This table was cited from Page II (2009) (19)

1.1.3 Differentiation of Terms

Several different terms related to interprofessional collaboration exist. These terms are used interchangeably by professionals (19) which demonstrate their lack of mutual

understanding of IPE. Thus, it is important to understand the difference among the terms that are used. The definition of terms is summarized in Table1 (19).

1.1.4 Learning outcomes of IPE

Professionals from other disciplines coming together and collaboratively learning is not a new concept. Learning outcomes common to IPE include enhanced understanding of roles and responsibilities of other health and social care professionals, improved knowledge of the nature of multidisciplinary teamwork, and development of teamwork skills and summarized in Table 2 (25).

Table 2 Learning outcomes of IPE

Themes	Subthemes
Teamwork	<ul style="list-style-type: none"> – Knowledge of, skills for, and positive attitudes to collaborate with other health professionals – Improve collaboration with other health professionals in the workplace
Roles/responsibilities	<ul style="list-style-type: none"> – Knowledge and understanding of the different roles, responsibilities, and expertise of health professionals – Knowledge and development of one’s own professional role – Knowledge of the health care system and organization of health care within it
Communication	<ul style="list-style-type: none"> – Communicate effectively with other health professional students, with other professionals – Negotiation and conflict resolution <p>Learning/reflection</p> <ul style="list-style-type: none"> – Identification of learning needs in relation to future development in a team – Self-questioning of personal prejudice and stereotyped views
The patient	<ul style="list-style-type: none"> – Working together and cooperatively in the best interests of the patient – Recognition of patient’s needs
Ethics/attitudes	<ul style="list-style-type: none"> – Acknowledge views and ideas of other professionals. – Respect

IPE can help students to recognize overlapping professional functions as well as activities and roles that are applicable to both professions. IPE also has the potential to solidify the students’ own professional identity and reduce stereotypes.

1.2 Models of interprofessional learning in community-based

An IPL in community-based is a clinical training at a community, at a nursing home, at a primary care service, at a family doctor clinic, where real patients are being treated and students from different professions delivered the care. The students work in teams and they are supervised by facilitators, who are professionals from the same professions.

Table 3 Literature review: Characteristics of IPE educational interventions

Educational interventions	n	%
– Small group discussion	48	57.8
– Patient case analysis	40	48.2
– Large group lecture	31	36.1
– Clinical teaching/direct patient interaction	29	34.9
– Reflective exercises	29	34.0
– Intervention reported as offered for credit	24	28.9
– Simulation	22	26.5
– Community-based projects	14	16.9
– E-learning	13	15.7
– Shadowing	12	14.5
– Written assignments	11	13.3
– Workshops	9	10.8
– Other (e.g. interviews, joint lab sessions and patient/family visits)	13	15.7

Total number of articles= 83. This table was cited from Abu-Irish (2012)

There are a wide range of IPE educational programmes available, and they are very diverse. Abu-Irish (2012) reported that IPE that focus on community-setting was only 16.9% (14 articles). Programmes are taught in different locations across student grades, use different methods and take place over varied time scales. Regarding about the teaching methods, seven programmes used small workshop as main teaching method, supplemented by: individual follow up, distance learning and supervised practice. Five of the studies described programmes with a broad mixture of education and learning methods such as: lectures, role-play, mentoring, seminars and tutorials. Only two studies described supervised clinical placement as the main interprofessional learning component (21, 26).

There are several initiatives studies that focus on IPL in community setting such as service learning programme at Rosalind Franklin University of Medicine and Science (Interprofessional Healthcare Teams), University of Florida (Interprofessional Family Health), Rural Interprofessional Service-Learning at Minnesota Rural Health School, the Interprofessional Rural Programme of British Columbia (IRPbc) and Students in the Community (SITC) at the University of Washington. In this thesis, the model of IPL in community-based in Indonesia was called as the COMIC (community-based interprofessional collaboration) programme.

1.2.1 Interprofessional Healthcare Teams (IHT) - Rosalind Franklin University of Medicine and Science

Background of IHT programme

Rosalind Franklin University of Medicine and Science (RFUMS) has responded to the challenge of interprofessional training by designing a one-credit-hour, pass/fail course called HMTD 500: Interprofessional Healthcare Teams (IHT). The course is a required experiential learning opportunity where students interact in interprofessional healthcare teams. Students focus on a collaborative approach to patient-centered care, with emphasis on team interaction, communication, service learning, evidence-based practice, and quality improvement.

Implementation of the programme

The course is divided into three components namely (1) didactic component, (2) service learning component, and (3) clinical component. During the didactic phase, students attend nine 90-minute interprofessional small group sessions. Five sessions are devoted to the learning concepts of interprofessional healthcare teams, collaborative patient-centered care (functioning as a collaborative team), service learning and county health assessment,

healthcare professions (a time to learn about their own health profession), and error cases and advocacy. In the service-learning phase, students are tasked with working as an interprofessional team to identify a community partner and engage in a community service project. Each team is expected to perform a service-learning project. Service learning allots time for students to process what they learned about their community: how their knowledge was used to help meet the needs of the community and how they had better understand themselves as a result of this activity. The third component is a clinical experience offered to interested students. Three students from different professional programmes such as physician assistant, physical therapy, and podiatry form an interprofessional team and attend four sessions at a clinical site. This helps put their didactic knowledge into actual patient care practice.

1.2.2 Interdisciplinary Family Health - University of Florida, USA

Background of the IFH programme

The Interdisciplinary Family Health (IFH) course has been providing interprofessional community-based learning experiences for over 10 years. The objectives of the programme are primarily to demonstrate to students the significant impact of environment and resources on health status, and emphasize the importance of interprofessional collaborative effort in providing services to patients.

Implementation

This programme is a required course for all first-year students in the Colleges of Medicine, Dentistry, and Pharmacy, the accelerated and traditional nursing students in the College of Nursing, the physical therapy and clinical and health psychology students from the College of Public Health and Health Professions, and the nutrition graduate students from the

Institute for Food and Agricultural Sciences. Students from the College of Veterinary Medicine participate as volunteers.

The course lasts for two semesters and is based upon four home visits, two per semester, with volunteer families in the local community. Four of these teams make up a small group, which is supervised by two interdisciplinary faculty members. The small groups meet six times during the year, in two-hour sessions. They are responsible for different tasks, learning objectives, and responsibilities on each visit.

After every home visit, each student submits a report that describes the visit from the student's perspective. For the first home visit, students are asked to submit a family genogram and a survey which describes the neighborhood in which the family resides, including access to drug and grocery stores, an assessment of the safety of the location, and other information that is to be filled out when the students are driving to their visit. At the second visit, students fill out an extensive health survey that assesses the family's health status, resources, and health behaviors. After that visit, student teams develop a project that will hopefully positively address the family's health status in some way. This could be preventive (such as an exercise programme for weight loss); social (arranging experiences and aid for single elders); economic (helping families enroll in Medicaid or other assistance); or educational (teaching families about their medical and/or socio-behavioral concerns). At the third group meeting, a social worker attends each meeting and provides assistance to the teams with regard to access to resources (27).

1.2.3 Rural Interprofessional Service Learning - Minnesota Rural Health School, USA

Background of the MRHS programme

The Minnesota Rural Health School (MRHS), which operated from 1996 to 2003, was the University of Minnesota's first initiative that provided rural, community-based, and

interdisciplinary health professions education. The programme was called as Rural Interprofessional Service-Learning. Service-learning programmes are distinguished from other approaches to experiential education by their intention to equally benefit the provider and the recipient of the service as well as to ensure equal focus on both the service being provided and the learning that is occurring. Service-learning is a relatively new concept in health professions education. This programme, under the auspices of the Pew Health Professions Commission, defined service learning as “a structured learning experience that combines community service with explicit learning objectives, preparation, and reflection.

The general objective was to benefit the communities and address local needs (through service-learning projects) as well as to provide rural interdisciplinary training. The objectives of the projects were (1) to improve the health of the community, (2) to work together as an interdisciplinary student group with community members and faculty on a specific task, and (3) to gain knowledge and experience in health planning.

Implementing the IPL in community based

The curricular components of the project included (1) a weekend orientation retreat, (2) service-learning projects, (3) community experiences organized by site coordinators, (4) interdisciplinary case studies (including paper and actual patient cases), (5) interprofessional OSCEs (objective structured clinical examinations), and (6) communication technologies, which consisted of interactive television for providing educational experiences across sites; videophones that provided “home visits” to elderly patients; diagnostic-level video technology for consultation with regional hospital emergency department personnel; and six Web-based educational modules on various aspects of rural and community health.

The student teams concentrated on several steps in planning their service-learning community projects. The project provided the MRHS Internet learning module, “Community Assessment and Intervention,” that assisted the students in this process by asking them to:

- Assess community needs. Methods may include interviews (key informants/focus groups), participant observation, secondary analysis of existing data (public documents, health surveys, minutes from meetings, statistical data, health records), and community surveys.
- Using the data that has been gathered, identify community strengths and needs.
- Prioritize. Criteria include community awareness of and motivation to solve the identified problem, consequences if the problem is unsolved, and the ease in which the issue can be addressed.
- Identify the community’s present strategy for addressing the problem.
- Develop goals and objectives for dealing with the issue.
- Plan and implement interventions.
- Evaluate structure, process, and/or outcomes of interventions (i.e., programmes or policies developed).
- Critically reflect on the experience, including an analysis of the effectiveness of the interdisciplinary team.

At the conclusion of each MRHS programme session, each community student group presented an overview of its project to other students and faculty via interactive television. In addition, each group submitted a one- or two-page written executive summary of their service-learning experience (28).

1.2.4 Interprofessional Rural Programme of British Columbia (IRPbc) - University of British Columbia, Canada

Background of the IRPbc programme

The Interprofessional Rural Programme of British Columbia (IRPbc) was established in 2003 as a response to the recruitment and retention needs of health care professionals in rural British Columbia, Canada. The programme was designed to expose students in the health professions to rural communities while at the same time training future practitioners to work effectively together. As one of the largest interprofessional initiatives in Canada, and the first of its kind in rural communities, IRPbc offers a unique opportunity for students from a range of health professional programmes to experience life and to practice in rural British Columbia communities while learning about the roles, capacities and contributions of professions other than their own.

There were three reasons for this project. The first was to provide students with an opportunity to provide a service not regularly provided to the community. The second was to help the students develop a broader vision of the impact of their work beyond the traditional walls of the health facility. The third, and equally important, was to bind the team together through a common goal.

Implementing the IPL in community based

Designed to foster IPE and promote rural recruitment of health professionals, the programme places teams of students from a number of health professional programmes into rural and remote British Columbia communities. In addition to meeting their discipline specific learning objectives, the student teams are provided with the opportunity to

experience the challenges of rural life and practice and advance their interprofessional competence.

Prior to the commencement of each phase of IRPbc the participating students were brought together at UBC for a two-day orientation to the programme. The students took part in modules on IPL and competencies, teamwork, personality and interactional styles, rural health, working with victims of violence, working in rural communities and working in Aboriginal communities. The orientation also allowed students within each of the teams to begin learning about each other and to practice working together.

Besides completing the requirements of their own professional education while on placement, the students had to meet a number of IRPbc goals. They were expected to develop an understanding of the roles of the members of the interprofessional team including such areas as professional boundaries, areas of collaboration and teams and team interactions. The participants were also responsible for identifying and exploring issues of common professional interest to their student team. In addition, the students were required to complete a number of IRPbc assignments meant to facilitate the acquisition of interprofessional skills and attitudes (29).

IRPbc had cycled through three placement phases in the summer of 2003, and in the winter and summer of 2004, respectively. Each phase lasted approximately 12 weeks although students participated for varying lengths of time depending on the requirements of their professional programme. In general, student teams within each phase included one student from each of four to six different professions. While it was deemed important to have at least five different professions on a team this was not always possible because of preceptor and student availability.

In order to work on the assignments the students met together as a group for a minimum of three hours per week although most teams met one day a week. This was a

mandatory meeting that took precedence over other learning opportunities for all team members. The students were also expected to engage in weekly case presentations or clinical rounds with their interprofessional team. Using a client example or relevant practice issue, each team member was expected to conduct a case conference. In addition, each student was expected to shadow at least two other students and/or health care professionals from a profession other than their own for at least two hours during the course of the placement. Finally, the students were asked to complete daily entries into individual learning journals throughout the course of their placement. Within the journal, students were expected to summarize insights and thoughts related to interprofessional practice, team interaction, conflict, and/or collaboration.

1.2.5 Students in the Community (SITC) - University of Washington, USA

Background of SITC programme

Students in the Community (SITC) is an interprofessional collaboration of health science students at the University of Washington. SITC runs a weekly free clinic at the Aloha Inn, a transitional housing facility for 70 homeless men and women in downtown Seattle. The focus of this clinic is on health education, chronic disease management, and re-integration of patients into the healthcare infrastructure. SITC serves as a valuable service learning opportunity for students. In addition to direct clinical services, students gain experience in planning health education strategies, community collaboration, and evaluating intervention outcomes. SITC also oversees a lecture and discussion based elective course at the University of Washington focused on health issues of the homeless community and provides formal teaching which complements the service-learning component of the endeavor.

Implementing of the SITC programme

Student-run free clinics exist at many US medical schools. Similar to other student-run clinics, Students in the Community finds strength in its interprofessional student involvement and represents students from social work, public health, occupational therapy, social work, pharmacy, nursing, medicine and physician assistants programmes. While most student-run clinics are administered under the umbrella of a medical school, SITC is unique because its institutional support comes from the Center for Health Science Interprofessional Education, a stand-alone organization with faculty representation from across the health sciences.

SITC began as a University of Washington medical student-initiated project in 2001. SITC is the only student-run clinic to be run out of a transitional housing facility for the homeless. As semi-permanent housing, the Aloha Inn offers nine months of shelter to individuals transitioning out of homelessness. As part of the educational mission of SITC, the steering committee designed an academic course to expose students to the principal issues of the medically underserved and the importance of interprofessional collaboration in this setting. The course is currently in its fourth year and has students enrolled from social work, pharmacy, medicine, nursing and public health.

The weekly clinic has been in operation since April 2004. Each clinic is staffed by a clinic manager, two preclinical students, two clinical students, a referral specialist and a physician preceptor. The clinic manager provides logistical support during the clinic, brings patients to the examination rooms, and generally oversees the functioning of the clinic. A referral specialist, most commonly a social work student, attends to assist with social service referrals. Students see patients in teams of two: one clinical student (third or fourth year medical, second year PA or nurse practitioner student), and one preclinical student (a student from any health science programme). If necessary, the referral specialist will visit with the

resident while the other students present to the preceptor and create a medical plan. This system allows teaching across student levels and between professions.

The University of Washington developed an interprofessional team simulation which this simulation was integrated into the core curricula of the Medex, medicine, nursing, and pharmacy programmes. The aim of this simulation programme is to promote interprofessional teamwork through simulation. In this project, interprofessional student teams collaborate to provide urgent care to simulated patients. The simulated cases involve an acute asthma exacerbation in an emergency room setting, a serious cardiac arrhythmia in an intensive care setting, a patient presenting to an urgent care setting with acute shortness of breath, and two cases involving disclosure of medical errors.

To ensure that SITC is effectively serving patients, the Evaluation Committee has developed a two-fold plan to assess SITC's effectiveness at meeting patient needs. A patient satisfaction survey using validated questions has been developed to address important patient-provider relationship factors such as patient-centered communication, provider attitude, and privacy. The survey was administered during the winter of 2006. The second component of Programme Evaluation will focus on student development. Initial efforts will focus on student satisfaction surveys. Subsequent evaluation will utilize questionnaires to assess students' attitudes toward both interprofessional collaboration and toward the homeless (30).

1.3 Health and Education Systems in Indonesia

1.3.1 Health system and community-based health care in Indonesia

As a country with a population of more than 215 millions, it is a heavy task for the government to serve the population with health care, since they are living scattered in more than 13.600 islands. Also Indonesia has a variety concerning race, ethnic, religion, social

strata, education and language. Therefore it is difficult for the health services to satisfy the whole community at the same time. The Indonesian health system of today is the result of the many changes over the last 60 years(31). In the 1950's health facilities, this had a markedly curative orientation, consisted mainly of private and public hospital. A new health system based on integration of preventive and curative medicine is introduced since 1951. This new system was to distribute health facilities and providers to the people by building and staffing network of public health facilities throughout the country. Element of this new system was the health center at the sub district level; it was complemented by a hospital at the district level. By the mid 2000's, there were more than 9,000 health centers with an average population per center of less than 30,000, more than 20,000 health sub-centers. In mid 1980's a programme to locate midwives in village was started in order to reduce maternal mortality rate in Indonesia.

The Indonesia government is planning to empower community health centers across the country to help provide medical treatment for people in rural areas and promote the importance of healthcare. This situation was an impact of the economic crisis in 1997 that has affected all aspects of life in Indonesia. Finally this situation leads to the condition in which many people could not afford to fulfill their basic needs such as health, nutrition and education. This will form part of efforts to meet the Millennium Development Goals (MDGs) set for 2015. About 25 percent of a total 9,133 community health centers (Puskemas), located especially in remote areas, were currently not led by doctors. The government is planning to recruit 10,225 midwives, 2,586 doctors and 722 dentists this year.

Figure 1 describes the Indonesia health system from central level to peripheral level. The government health care system has three main levels namely (1) Minister of National Health (MONE), (2) Provincial Level Health Office, and (3) District Level Health Office. Indonesia's health service infrastructure includes government health services (public hospital

and health center), foreign aid, non-profit health organization (NGOs), religious organization, and the private sector. The organization of the Health Care system in Indonesia is as follows (32):

(1). At the city level, there is a City Health Office that is headed by a Medical Professional appointed by and responsible to the Mayor for administrative and operational matters in health policy and medical procedures and which is also responsible to the Department of Health at the national level.

(2). At the community level the Puskesmas (Community Health Center) provides comprehensive health services. The area of the Puskesmas is a subdistrict or a part of the sub district. The area covered is determined by the density of population, geographical nature of the area and the state of transport infrastructure. Typically a Puskesmas serves 30,000 people.

In implementing the health programme, the Puskesmas is supported by a network including Pustu (Assistant Puskesmas), Pusling (Mobile Puskesmas), and Village Midwives Clinic (BDD). A Pustu is a simple health service unit under the Puskesmas that covers two to three villages (approx 2000 to 3000 people). A Pustu is an integral part of the Puskesmas. A Pusling is a mobile health services unit that is equipped with a motorcycle, car or boat, healthcare and communication equipment. In remote areas that cannot be reached by the formal health services, a Pusling replaces the function of a Puskesmas or Pustu (Figure 1). A Village Midwives Clinic (BDD) serves one or more villages which do not have other health services. The midwife is provided with a building with obstetric facilities where she lives and works.

Community-based health care (CBHC) in Indonesia varies such as Puskesmas (Community Health Center/CHC), private clinic, midwife private clinic, and family doctor clinic. Puskesmas, as the spearhead of Indonesian national health development, is funded by

government and has basic six services including child and maternity health care, nutrition, health promotion, medication, communicable diseases control and environment health, and immunizations programme. In addition, some Puskesmas provide both outpatient services and inpatient services since these Puskesmas normally have 10 to 20 beds. Usually Puskesmas that have wards are located in remote areas. To support these programmes, Puskesmas has various human resources including medical doctor, dentistry, nurse, midwife, pharmacy, public health officers and administration staffs. Those workers have adequate skills to develop healthcare programmes, ranging from health promotion to disease prevention and control.

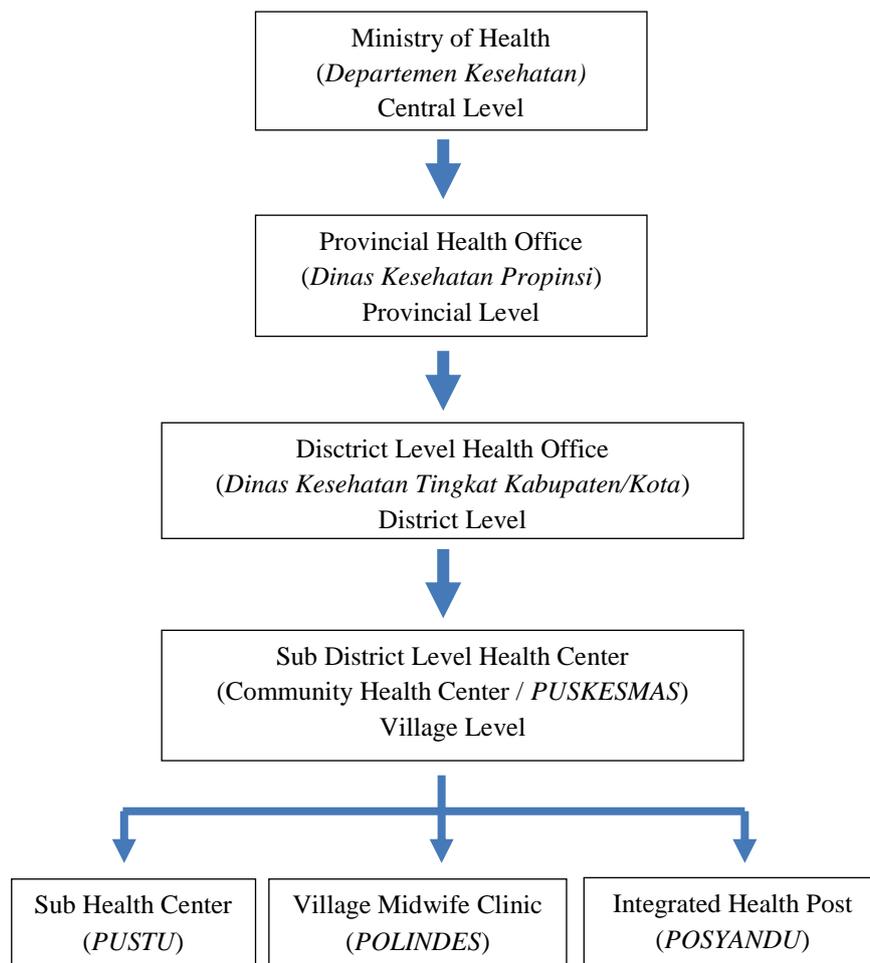


Figure 1 Indonesia Health System: From central to peripheral level

The development of an effective primary care approach must give attention to those who actually seek services and to the larger community as well. This may involve the mobilization not only of physicians, nurses, technicians and physician assistants, but also nurse practitioners, health educators and social workers. To the extent that the population is sufficiently large, it become more economical than smaller practices to provide supporting services to facilitate comprehensive care and care more attuned to patient with less common needs, such as the parents of retarded children, the bereaved or the spouse of chronically ill persons. Primary care, if it is to be effective, must be accessible to the population it serves.

1.3.2 Education system for medical and health professional in Indonesia

Indonesia is a country with population of 220 millions, 81 public and 2,514 private higher education institutions; and 3.5 million students. The Ministry of National Education (MONE) through the Directorate General of Higher Education (DGHE) and other ministries such as the Ministry of Religions Affairs and the Ministry of Finance manage provision of higher education in Indonesia.

Indonesia has been able to make great progress in increasing the coverage of health services. A significant reason behind this is the thousands of health workers graduating from schools annually. However, quality of new graduates still needs to be addressed and focusing on the education they received is vital. Quality of the schools varies widely, where quality of newly established education institutions remains poor. Evidence shows little improvement in quality of doctors, nurses and midwives during the period of 1997-2007.

Societal and health care changes have presented many challenges for medical and health professionals in Indonesia. The challenge for medical and health professional education is to ensure that professional education remains relevant and keeps in track with the needs of the market. These challenges include globalization, changes of patient

characteristics, impact of technology, information, migration, future tendencies and other current issues in the development of health education in Indonesia (33). To support this situation, Indonesia Government issued some regulations that include (1) regulating capacity of distributions of health care practitioners (HCP), (2) regulating competency of HCP, (3) regulating quality of healthcare service, (4) regulating financial systems, and (5) regulating the ethics-legal aspects (34).

In general education systems is under the responsibility of the Ministry of National Education (MONE). Since 2009, the World Bank has been working with the Indonesian government to implement the Health Professional Education Quality (HPEQ) project to help ensure that doctors, nurses, dentists, midwives and other graduate with the same level of competency.

Since 2005, medical schools in Indonesia have implemented the new curriculum that called as “Kurikulum Berbasis Kompetensi/KBK”(or Competency Based Curriculum/CBC). The first 3 – 3.5 years are pre-clinical years. Using the new block system or modules, student learn basic medical sciences by applying problem based learning. Students who have completed the first 3.5 years are already considered as graduates and granted with the title “Sarjana Kedokteran: (Bachelor of Medicine). The last 1 – 1.5 years are clinical/clerkship years. Students work in wards (internal medicine, pediatric, surgery, obstetrics/gynecology and other departments) at hospitals and health centers (for 8 weeks). Upon completing the clerkship, students graduate as medical doctor, however they are not allowed to practice independently (35).

Since 2010, after finishing the clerkship phase, students have taken an internship programme for a year – unpaid – to work at public hospitals and health centers to obtain doctor certificate. After finishing the internship phase, new doctors can practice independently.

For nursing education in Indonesia, there are two types of nursing programme namely (1) bachelor of nursing and (2) diploma of nursing programmes. Bachelor of nursing is a four-year nursing course in which students enter from senior high schools and is offered at selected government universities in Indonesia. Admission is based on a national examination and all bachelor programmes use the same core curriculum. The diploma-nursing programme is a three-year nursing course that is conducted in schools of nursing and the students come from senior high schools. Scholars who graduate from diploma nursing programme can upgrade their title to become bachelor of nursing by taking another course for 1 – 1.5 years.

Nursing students continue with Professional Nurse Education for a year and this programme is completed by taking a University Exam approved by Indonesia Nurse Association. A graduate from this professional programme is called a Ners (Professional Nurse) (36).

Bachelor of Pharmacy (SarjanaFarmasi) is a four-year pharmacy course continued by Professional Pharmacist Education for a year. This training is completed by taking a University Exam approved by the Pharmacist Association. The target of the education programme is to achieve the competencies of pharmacist in accordance to national (Indonesian Pharmacist Association, ISFI) as well as international (Federation Internationale Pharmaceutique, FIP) standards. With such standards, graduates have the competencies to work in various sectors of pharmacy such as pharmaceutical industry, pharmaceutical care (hospital, community pharmacy, primary healthcare center), registration and regulation (surveillance, testing and evaluation), academia and research (37).

Bachelor degree of Public Health is a four-year course. The first 2 years phase of basic sciences such as health and disease, anatomy and physiology, basic statistic are learnt. The last 2 years are specialization phase and divided into 8 specializations namely

administration of health policy, health promotion, epidemiology, environmental health, reproductive health, occupational health, nutrition and medical record.

1. 3.3 Faculty of Medicine and Health Sciences, State Islamic University Jakarta

State Islamic University, Syarif Hidayatullah, Jakarta is a public Islamic university in Indonesia. The Faculty of Medicine and Health Sciences (FMHS) was established in 2005. The courses run by the FMHS are medicine, nursing, pharmacy, and public health. Admission for students in all majors is through several exams or selections, namely national examination, university examination, and direct recruitment of the best students from Islamic boarding schools in remote areas. Almost 60% of FMHS students are from Islamic boarding schools in rural areas and the rest are from both private and public high schools.

Students who come from Islamic boarding schools are obliged to participate in the matriculation programme since the proportion of general knowledge and religious knowledge in the curriculum at many boarding schools was 3:7 consequently students from some boarding schools have difficulties with the learning process and activities. The FMHS provides the matriculation programme that is carried out over a two-month period. The content of the programme comprises modules of basic sciences (math-statistics, physics, chemistry, and biology), English, computer skills and literature searching skills. The matriculation programme is conducted prior to any formal education activities in the faculty.

Generally, teaching methods for the first three years are lectures (80%), whereas other teaching methods are discussions, laboratory work and simulation in some modules or subjects. Furthermore, in the last two years, lectures have no longer been given; instead students have engaged in clinical practice, apprenticeship, or community work. Students study in the same faculty building in first three years, whereas in the 4th and 5th years students work in clerkship and internship programmes at public hospitals, health centers, the

community, or they conduct fieldwork research. In the learning process, the courses are given in the Indonesian language; however, the students are required to pass language proficiency tests i.e. Test of English as a Foreign Language (TOEFL) with a minimum score of 475 and Test of Arabic as a Foreign Test (TOAFL) with a minimum score of 300 (which is equivalent to 475 score of TOEFL).

The curriculum for the medical profession is different from many other professions. Medical education in Indonesia is conducted in 6 years with various learning methods including problem-based learning, self-directed learning, and problem solving for the first three years; clinical practice with case-based learning is applied for the last 2 years in public hospitals and health centers, and internship programmes are taken for a year to obtain doctor certificates.

1.4 Need for the study (relevance and significance)

IPE, the core of collaborative practice, has permeated widely in various institutions. Educational research on IPE has been carried out by the various professions and has demonstrated the positive impact of IPE and collaborative practice among practitioners and the community (4). In the current situation, despite the implementation of IPE for more than three decades, the development of IPE in developing countries was limited (4). Unfortunately, only some studies from institutions in developing countries reported their programme related to IPE (38).

In Indonesia, the Ministry of National Education (MONE) officially launched the introduction of IPE two years ago (39) but IPE remains a scientific discourse (scientific debate) among health educators and professionals in Indonesia, and it has not been implemented as a policy integrating IPE into 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 as the means of learning because 1) primary healthcare is the forefront of health services in Indonesia, 2) nursing home care 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 particularly work with non-health professionals in the community such as paraprofessionals (social workers, educators, lawyers), community volunteers and indigenous workers (Islamic scholars, traditional birth attendances, non-registered nurses, etc) whose numbers were vast and who have unique roles in supporting the health programmes 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 programme toward achievement of student's interprofessional competencies and its implementation in community practice.

1.5 Significance of the study for State Islamic University

To our knowledge, no research has been conducted in employing IPE in CBHC among undergraduate health professional students in Indonesia. This research will be useful for students, faculty and patients. The study is significant for medicine and health professional students because an educational intervention programme will assist the students to work in a group, understand other professions and improve their professional skills. Additionally, the study is beneficial for medicine and health professional schools in Indonesia as this educational intervention will support the existing curriculum to produce graduates who have the skills needed to deal with complex health problems. Similarly, the patient will gain a

benefit if all health care providers were exposed to this programme because IPE has proven to have a positive impact on improving healthcare quality, reduction in length of hospital stay and improvement in health service delivery in accordance with standards.

1. This educational programme will generate a model of IPE in CBHC giving a positive impact for students, teachers, programmers, and managers not only in education institutions but also in health institutions. These impacts include:
 - Learners will increase capacity of practice collaboratively in simulated and practice based of clinical setting
 - Learners, teachers and professionals will have the ability to practice collaboratively in urban and rural areas
 - Learners, teachers, managers, and stakeholders in health and education institutions will improve the ability of interprofessional and collaborative practice.
2. This programme will improve healthcare outcomes in Indonesia such as increased patient satisfaction, increased participation by patients and families in promotion and prevention programmes, increased quality of care, and improved professional practice among health professionals.

1.6 Purpose of the study

Most healthcare education (particularly in the pre-registration university or classroom settings) in Indonesia is **uni-professional**, in which students learn together as a single group based on their profession, e.g. nurses, doctors, dentists, midwives, allied health professionals or social workers, and do not learn with or alongside other professional groups. IPE is primarily concerned with students or professionals actively learning together. This learning is based on an exchange of knowledge, understanding, attitudes or skills with aim of improving collaboration and healthcare outcomes (40).

The purpose of this study was to gain a greater understanding of the experience and preferences of students from medicine, nursing, pharmacy, and public health regarding IPL and collaboration in healthcare. In addition, this study enhances understanding of the dynamics and complexities of IPE through case study.

After being involved fully in this programme, students will:

1. Understand the benefit and importance of IPE related to their profession
2. Understand the roles of their own profession and other professions to treat 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 family members
6. Have the knowledge and skills to assess patient's problems with the home care service,
7. Develop behaviors for collaborative practice in the home care service.

1.7 Framework of COMIC programme

Achievement of student's interprofessional competencies requires an integrated programme, and some previous studies showed that by applying a variety of modalities of teaching methods and learning process, which is theoretically developed by combining both learning theory and psycho-social domains, will greatly assist the achievement of the programme outcome. To achieve the objective, the programme was divided into three phases (Figure 1) as follows (1) foundation of cognitive and attitude to understand IPL and collaborative practice, (2) development of skills to interact and work in interprofessional concept, and (3) implementation of collaboration practice skills at community setting. The student who participated in this programme was expected to engage in all phases. Each phase is interrelated and underpinned the various theories as well as involved different teaching methods to achieve the learning objectives of each phase.

The first phase was foundations of IPL and an important phase to overcome obstacles in introducing a new programme. A set of tutorial to build basics of knowledge and attitude towards IPE was introduced and the programme provided the modules including communication, empathy, professionalism, social-culture adaptation, team process, and roles of professions. Building skills to interact with other profession and to work in team were performed by employing simulation models.

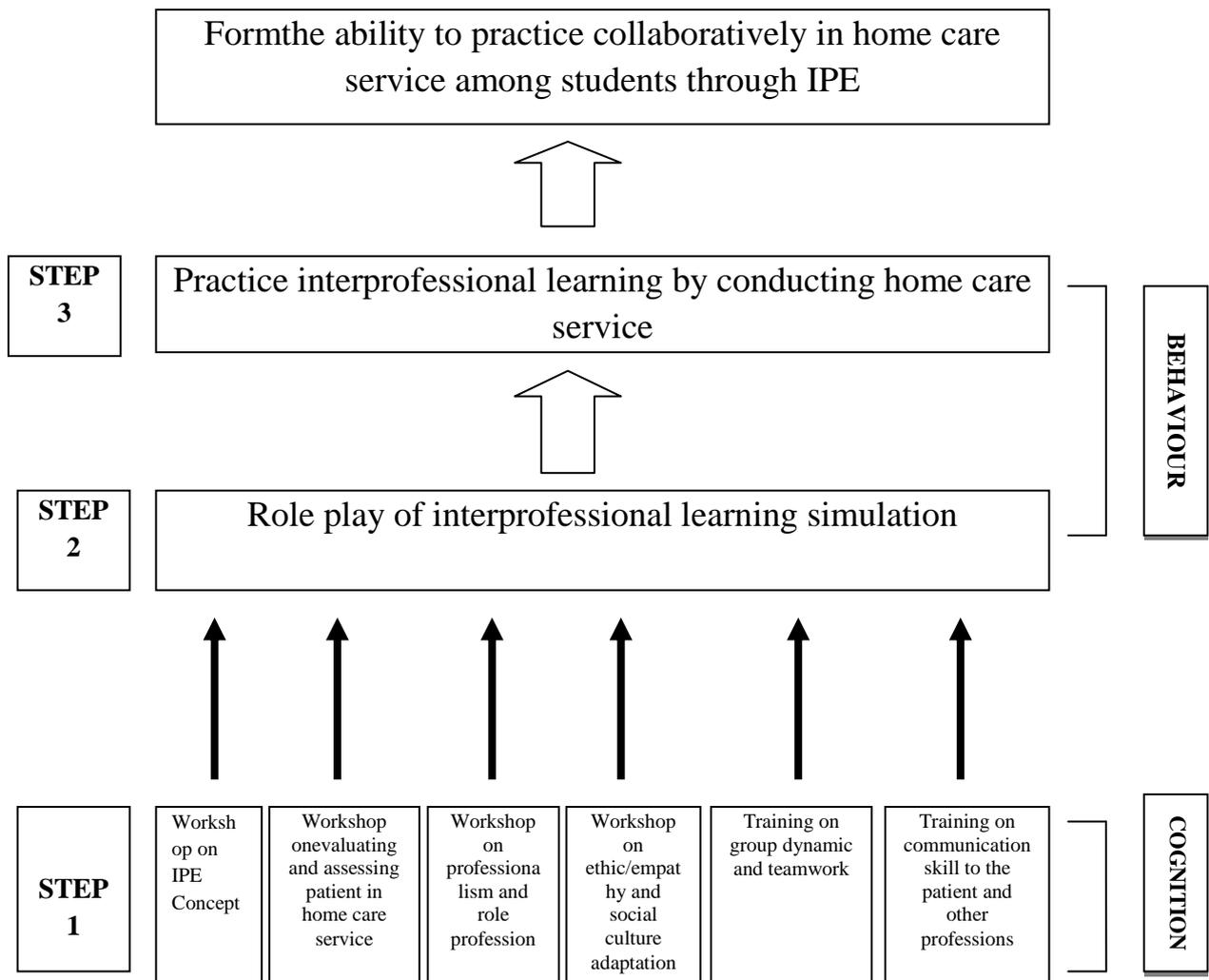


Figure 2 Framework of educational intervention programme

One of strategies to develop the long-term IP competencies is by transferring student's knowledge, attitudes and skills into the practice; therefore, the programme implemented the concept of practice-based to give opportunity to the students by conducting home care services as a model of collaborative practice. This is the third phase. A small group of students conducted the patient visit and a group of tutor and a community volunteer (a cadre) accompanied them during visit. The students were asked to collect information related to the patient's disease, decide the diagnosis of the patient's problems and the factors that influence it, make recommendations to resolve patient's problems and conduct follow up home care to evaluate patient's condition.

1.8 Structure of the thesis

The thesis is organized into six chapters. *Chapter 1* contains the introduction, the research problem, definitions and evidence of IPE, model of IPE evaluation programme from many institutions, need for the study (relevance and significance), purpose of the study, research questions, and framework of the research. *Chapter 2* provides an overview of material and methods that used in this study. It presents more details regarding the research design, participants, procedures, and data analysis. This thesis divided into 2 study namely psychometric analysis and validation scales (Study 1) and implementation and evaluation of the IPE programme (Study 2). *Chapter 3* provides an overview of the educational programme that was implemented to provide evidence for the research question this study. *Chapter 4* presents the result and discussion of Study 1. Study 1 was aimed to validate the scales that were translated in the Indonesian version. This study adapted the readiness for interprofessional learning scale (RIPLS), scale of conflict in-group (CIG) and scale of atmosphere in-group (AIG) that used in main study.

Chapter 5 provides the results and discussions of Study 2. Study 2 was aimed to evaluate the effectiveness of an IPE pilot programme. The results are presented in four sections, which were established from the concepts of Kirkpatrick's' evaluation model. The sections are (1) participant's reaction, (2) attitudes, perceptions and knowledge, (3) behavior in practical setting, and (4) the impact of the programme. Chapter 6 contains discussions about this study and other studies, implications of this study into practice, recommendations for future study, a planning to implement COMIC programme at FMHS, and conclusions.

Chapter 2

Materials and Methods

This chapter gives an overview of the materials and methods of the study. The study is divided into two studies included Study 1 was to analysis and validate the scales (Chapter 4) and Study 2, an educational programme intervention, was to evaluate the effectiveness of the IPL programme in community-based for development of the competencies for collaborative practice (Chapter 5). Chapter 2 describes the material and methods for both studies. Chapter 3 elaborates the IPE pilot programme in detail.

2.1 Study 1: Psychometric analysis and validation scales

2.1.1 Design of study

Cross sectional study was applied in this study and the survey was carried out twice. First survey was for the study of validating scale of conflict in group (CIG) and atmosphere in group (AIG). Study 1 was conducted at Faculty of Medicine and Health Sciences (FMHS), State Islamic University, Jakarta.

2.1.2 Sample

To obtain a reliable and valid scale using factor analysis (exploratory factor analysis/EFA and confirmatory factor analysis/CFA), larger samples were needed. There were no consensuses about number of samples among researcher. Some researchers give different argument about the minimum number of samples required to perform psychometric validation on a scale by using confirmatory factor analysis (41). Some guidelines about number of samples were proposed such as argument from Kline (2005) and Hair (2005) suggested minimum number of samples was 10-20 times the number of parameters (41, 42).

Other argument suggested 200 samples if the researcher anticipated no problem in data (missing value, non-normal data). Thus, using the guideline from Kline (2005) and Hair (2005), this study needed at least 390 participants to test the Indonesian version of RIPLS scale that consisted of 19 items and team performance scale that contained 19 items.

The study was conducted from December 2010 to October 2012. The population consisted of the students from four disciplines namely medicine, nursing, public health, and pharmacy. The total number of registered students was 1,393 (Table 4).

Table 4 Distribution of FMHS students on academic year 2010-2011

Discipline	Number of students				
	1 st year	2 nd year	3 rd year	4 th year	5 th year
Medicine	75	75	75	53	55
Nursing	40	40	40	40	30
Pharmacist	75	75	75	75	70
Public Health	100	100	100	100	100
Total	290	290	290	268	255

The first survey was done from the 20th to 28th February 2011 among first to third-year students from medicine, nursing, pharmacy and public health. We distributed 350 questionnaires among first to third-year students and 320 questionnaires were returned. The response rate was 91.4%.

The second survey was conducted for the study of psychometric analysis and validating scale of RIPLS, satisfaction, and role profession. The second survey was employed on February 2012. A total of 800 questionnaires were distributed and 776 students from first to fourth year study returned the set of questionnaires. The response rate of RIPLS study was 97%. The faculty members distributed the set of questionnaires in the classrooms and students returned it at the administration room (where we provided boxes for each discipline).

For validation of CIG and AIG, we obtained 302 valid questionnaires whereas for validation of RIPLS, we obtained 755 valid questionnaires. The sample size of 302 and 755 met the minimum criteria (41, 42).

2.1.3 Instruments

Scale of Conflict in Group (CIG) and Atmosphere in Group (AIG)

The educational intervention employed an atmosphere in-group (AIG) scale (43, 44) and an conflict in group (CIG) scale (45) to measure the conflict among members in-group and group development, and all scales had good reliability and validity (43, 45, 46). The group atmosphere scale was made of eight positive statements and all items were positive statement whereas conflict in-group scale consisted of 11 negative statements and all items were negative statements. Participants were asked to indicate their strength of agreement on a 7-point Likert-type scale (1=very strongly disagree, 4=neutral, 7= very strongly agree). This is the first study using a scale CIG and AIG in IPE programme.

Readiness for Interprofessional Learning (RIPLS) scale

The RIPLS is a validated instrument used to identify students' attitudes towards factors that affect the ability of collaborative practice (47, 48). The items of RIPLS represented 19 statements about attitude in IPL and grouped into three main subscales: effective teamwork, professional of identity and role of other professions (47). Different from the original scale, we only translated and used 18 statements in this study. The statement 17 (*the function of nurses and therapists is mainly to provide support for doctors*) was excluded since the use of the term "therapist" would be ambiguous among students who did not understand fully the definition of "therapist" and also the term "therapist" in the Indonesian language was not used in health and non-health or non-scientific fields.

Respondents chose their level of agreement from each item which uses a 5 Likert-type scale, ranging from 5 (strongly agree) to 1 (strongly disagree). The reliability coefficient of the RIPLS subscale ranged from 0.32 (sub-scale of *roles and responsibility*) to 0.88 (*sub-scale of teamwork and collaboration*) (47). Table 5 described the reliability coefficient of the RIPLS from previous studies both in original version and modified versions.

Table 5 Summarize of the internal consistency of RIPL scale from previous studies

Study	Number of samples	Number of items	Internal Coefficient (Cronbach's alpha)			
			Total	TWC	PI	RR
Parsell & Bligh (1998)	914	19		0.85	0.46	-
Parsell & Bligh (1999)	120	19	0.90	0.88	0.63	0.32
McFadyen (2005), data 2003*	308	19	0.84	0.79	NPI=0.60; PPI=0.76	0.40
McFadyen (2005), data 2004*	247	19	0.89	0.88	NPI=0.76; PPI=0.81	0.43
McFadyen (2006) *	65	19	0.89	0.71	NPI=0.38; PPI=0.61	0.62
Lauffs (2008)	214	19		0.89	0.48	0.34
Reid (Oct, 2004)†	66	23	0.76			
El-Zubier (2006) †	178	20	0.61			
Tamura (2012) †		19	0.74			

(*)McFadyen's studies produced four-factor model.

(†)The study yielded three factors but the items that made up these factors were different from other studies.

TWC=teamwork and collaboration; PI=professional identity; NPI=negative professional identity; PPI=positive professional identity; RR=role and responsibilities

2.1.4 Procedure

Cross-cultural adaptation process was applied to adapt the original version of all scales that was used in this study in the Indonesian Language according to guideline by Guillemain (49). The process was started by forward and backward translations(50). The translation was proficient in both the Indonesian and English languages.

The first phase was the translation of the questionnaire (forward translation) by two language experts. The second phase was aimed to assess the correspondence between the original version and the translated version. The scale in the Indonesian version was re-

translated into English (backward translation) by different language experts from the first phase to check for inconsistencies. Researchers evaluated both the original questionnaire and the questionnaire after being translated backward. This was carried out to check the similarity between the original questionnaire and the adapted questionnaire.

2.1.5 Data analysis

Statistic assumption

Evaluation of a scale or questionnaires involved reliability and validity tests of the scale (51, 52). The reliability and validity tests of the Indonesian version questionnaires were carried out in two stages: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) method. Before the scale was analyzed with either EFA or CFA method, the assumptions of such method must be met by ways of: (1) missing value matters, (2) outliers testing, (3) normality test, and (4) multicollinearity and singularity tests. Statistical analysis of this study used SPSS 17 and AMOS (analysis of moment structures) 18 for windows (41, 42).

Missing value analysis (MVA) was carried out using SPSS 17. If the MVA analysis resulted in the probability of score of MCAR (missing completely at random) < 0.5 , which means that missing value in the data, was not random, the sample with missing value could not take part in further analysis. In this study, the data was not modified in logarithm form since it would make it difficult to interpret the results (42).

Outliers test was carried out in both univariate and multivariate analysis. By considering that the number of samples that was more than 100, univariate outlier test used Z-score value in the range between -3 to +3 (41). It means that the data with Z-score of less than -3 or more than +3 could not take part in the study.

Furthermore, requirement of a normal distribution assumption had to be fulfilled when conducting factor analysis (41, 42, 53). Kline (2005) suggested that non-normal univariate distribution could be determined by skewness and kurtosis that were valued by each variable and argued that for each item, the skewness < 3 and the kurtosis < 10 were considered as univariate normality and any value higher than these were problematic. Multivariate normality test was employed when “maximum likelihood” method was particularly used in confirmatory factor analysis (53, 54). Bartle test was used to evaluate multivariate normal distribution, while to analyze the sufficiency of data, the study used the *Kaiser-Meyer-Olkin (KMO)* value (42, 54).

The presence of a correlation or a very strong relationship between the independent variable is a condition that must be analyzed before performing factor analysis. This phenomenon is known as multicollinearity or singularity (41). Multicollinearity was detected in the data if there were correlation (r -pearson) > 0.85 and singularity if $r > 0.99$ was found (41). In AMOS programme, the multicollinearity was detected by analyzing the condition number score in the sample moment result. Montgomery (2001) concluded that the sample moment with condition number < 100 had mild to medium multicollinearity, and more than condition number of 100 had severe multicollinearity (55).

Factor Analysis

To ensure the structure of validity and to determine the best factor structure to represent all scales in the Indonesian version, both EFA and CFA were performed. The EFA was run to identify latent variables or factors of a set of variables (53) whereas CFA was to assess the fit of a model obtained from the EFA result or a previously existing theoretical model and test convergent validity and discriminant validity of fit model (42, 53, 54).

The factor analysis of the Indonesian version by EFA was carried out by applying promax rotation with maximum likelihood, eigenvalue > 1 , and confirmed by scree-plot graphic. Choosing of the promax rotation for factor analysis by EFA was based on the assumption that all statements in a scale and factors describing constructs were inter-correlated (56). Decisions to determine the number of factors which were formed are by referring to the eigenvalue, retaining several factors based on eigenvalue of 1 or more. A scree plot, first introduced by the Cartel (1960), was also examined to determine the number of factors that was retained by connecting between the slope of the line formed by the eigenvalue of the factors (57).

The second phase was the testing of the Indonesian version scale by CFA method. CFA was applied to confirm subscales formed by EFA method and assess reliability and validity of measurement model of the Indonesian version (56). To get a fit measurement model, the CFA was run multiple times to consider several options. There were two kinds of measurement model namely (1) initial model as the benchmark (developed from EFA result) and (2) modified models created based on a previously existing theory, standards that must be met, or suggestion from the result of modification index.

Assessment of the models included two indicators: overall model fit assessment and assessment of fit of the internal structure of the model (52). Overall model fit assessment included two criteria: the preliminary fit criteria and overall model fit. Preliminary fit criteria of a measurement model must be free of any negative variance errors, the correlations between variables were greater than 1, the value of factor loading was small ($<.5$) or large ($>.95$), and variance errors were not significantly different from zero. Determination of overall of fit model was based on the assessment of overall of fit model and assessment of internal structure model for each measurement model (41, 58).

Criteria for assessment of overall of fit model included (1) loading factor for each items $>.7$; (2) approximate fit indexes $>.90$; (3) standard of root mean square residual $<.08$; (4) all items in regression weights are significant; (5) free from Heywood Case (a negative value of item loading or variance for each items) (41). For approximate fit indexes, the Normed Fit Index (NFI), the Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Tucker-Lewis fit index (TLI) and the Comparative Fit Index exceeds $.90$ would indicate model fit(59, 60). The value of RMS (Root Mean Square) represented the square root of the average or mean of the covariance residuals was less than $.08$ (61) and ideally was less than $.05$ (62) but the upper confidence interval of the RMS should not exceed $.08$ (63). The RMS indicator that was used in this study included Standardized Root Mean Square Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA). The relative chi-square is the chi square index divided by degree of freedom which value should be less than 2 or 3(41, 64). However, this index might be less sensitive due to the sample size.

Reliability and validity were the tests of the Indonesian version to obtain valid and reliable scale. Reliability measurement was performed to test the degree to which a measurement procedure produces similar outcomes when it is repeated, in short, reliability was described as the attribute of consistency on measurement. Joppe (2000) defines reliability as, —the extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable(56). In this study, we tested reliabilities of modified scales by assessing internal consistency reliability, item reliability and constructs reliability (42, 65). Cronbach`s α was performed to measure internal consistency reliability calculated by using SPSS Windows 16.0. Cronbach`s alpha of more than 0.7 described a good factor or unidimensional scale (42) however Cronbach`s alpha value of 0.06 and more was considered

acceptable (56). Item reliability represented the amount of variance in an item due to the underlying construct rather than to error (66), was measured by squaring the factor loading, and known as squared multiple correlations (SMC), with 0.50 as the benchmark for the items that are considered quite reliable (42, 66).

Assessment of internal structure model included test of convergent validity, normalized residual value (<2) and discriminant validity. Convergent validity was a test to assess construct validity being measured. Convergent validity measurement was assessed by item reliability, composite (constructs) reliability (CR) and average variance extracted (AVE) (42, 65). AVE, was first introduced by Fornell (1981), "the "average variance extracted" measures the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error ..." (65). If the AVE is less than .5, then the variance due to measurement error is greater than the variance due to the construct. In this case, the convergent validity of the construct is questionable" (65). For composite reliability, a threshold value of 0.50 was set for testing the convergent validity (42, 52, 66). Composite reliability (CR) and AVE was calculated manually by computing formulas given by Fornell and Larckers (1981) using Microsoft Excel 2007 (42, 65).

Discriminant validity was an indicator to assess unidimensional of constructs which test whether constructs or measurements that are supposed to be unrelated are, in fact, unrelated (42, 65, 66). Fornell and Larcker (1981) presented a formula for assessing discriminant validity of two or more factors by comparing the AVE of each construct with the shared variance between constructs. Shared variance is the amount of variance that a variable (construct) is able to explain in another variable (construct) represented by the square of the correlation between any two variables (constructs). If the AVE for each construct is greater than its shared variance with any other construct, discriminant validity is supported (42, 65, 67).

To compare the difference in measurement model and to indicate the fit model, there were two indicators for selecting a model: (1) if the measurement model was nested model, then the study employed X^2 difference test and (2) otherwise, by applying the AIC (Akaike Information Criterion) index with AIC has no such restriction (68). The final model of Indonesian version was the model that had the lowest AIC score among all measurement models.

2.2 Study 2: Evaluation of COMIC programme

2.2.1 Study design

The research design for this thesis was a mixed method including both quantitative (e.g. self-reported) and qualitative data (e.g. written responses). Brewer and Hunter (1989) summarized that the benefits of a mixed method approach is that it allows the exploitation of the potential strengths of each paradigm (69). The study was designed to: a) obtain the students' satisfaction who participated in the programme, b) measured students' knowledge, attitude, perception and skills to perform interprofessional and collaborative practice, and c) identify barriers and benefit to IPL in community-based practice.

The study took place at the Faculty of Medicine and Health Sciences (FMHS), State Islamic University, Syarif Hidayatullah, Jakarta, Indonesia. The FMHS deliver education for undergraduate students in the medical and health fields. The faculty has four disciplines including medicine, nursing, pharmacy and public health.

The study conducted pretest and posttest measurements as well as repeated measurements over the programme to assess changes and developments in the dependent variables. In total, six measurement points were implemented during the programme. The effects of the educational programme intervention on students' attitudes, perceptions, knowledge and behaviors were assessed through the comparison of test results prior, during,

and after the intervention at the five measurement points (section 2.6).

2.2.2 Population and Sampling

Population

The population for this study is all undergraduate students who are enrolled in the Faculty Medicine and Health Sciences (FMHS), State Islamic University, Jakarta, Indonesia.

Sample and sampling method

The participants in this study were students from four different disciplines (medicine, nursing, pharmacy and public health). This study used a non-random sampling technique. Participation in this study was completely voluntary; this made the sample size dependent on the number of healthcare professionals who voluntarily agreed to participate in this study.

The recruitment of students for Study 2 was conducted by involving the third year students and this recruitment was held from February to March 2012. We distributed flyers in the classroom and 20 students from each discipline (medicine, nursing, pharmacy and public health) volunteered to participate in this programme. The flyer contained information about the COMIC programme, the activities, and duration of the programme. These 80 students were distributed into 20 teams of four students representing each discipline.

2.2.3 Variables

Table 6 mentioned about the variables dependent of Study 2. The dependent variable on level 1 (reaction) is the level satisfaction of IPE programme. On level 2a (attitudes and perception), they are readiness for IPL, students' perception of role profession, conflict in-group and group atmosphere. On level 2b, knowledge was assessed the students' knowledge of IPL. Dependent variables on level 3 (behavioral change) are team performance whereas on

level 4a (organizational change), they are tutor’s evaluation and recommendation of the IPL programme. Using of multiple assessment methods in Study 2 was a strategy to deal with internal validity due to this study used single group design (70).

Table 6 Assessment of dependent variables

Evaluation Level†	Dependent Variables
1. Reaction	Student satisfaction
2a. Modification of attitudes and perceptions	Readiness for IPL Conflict in-group and group atmosphere Role perceptions
2b. Acquisition of knowledge/skills	Student’s knowledge of IPL
3. Behavioral change	Team performance
4a. Change in organizational practice	Tutor evaluation of the programme and the recommendations
4b. Benefits to patients/clients	Not assessed

† *Kirkpatrick’s evaluation model (1967)*

Level 1 – student’s reactions

Level 1 was to evaluate student reaction by measuring the level of student’s satisfaction and student’s comments about the quality of learning methods used in the programme. The six items of satisfaction scale (71, 72) were developed by Brehm et al. (2001) and Ruona et al. (2002) and translated into the Indonesian language. Item answers were given on 7-point Likert scales (1=very strongly disagree, 2=strongly disagree, 3=disagree, 4=neutral, 5=agree, 6=strongly agree and 7=very strongly agree). The satisfaction scale in the Indonesian version has a good reliability with alpha coefficient > 0.8. Student’s satisfaction was measured in three periods, T3, T4 and T5 (Figure 3). We interpreted a mean result of more than four as indicating a high level of satisfaction.

Learning method in this study consists of ten modules including interactive lectures (IPE, role profession and professionalism, empathy and social-culture adaptation), games or role play (dynamic group and team building), simulation (communication and IPE model), practice of IPE, and group discussion (after simulation and after home visit). The quality of a learning method was given values of 1 (poor) to 10 (best).

Level 2 – determining the extent to which learning has occurred.

This level was used to determine whether the training improved student`s knowledge, attitude and skills after the training programme. A number of techniques were applied in this level including subjective evaluation (self-assessment) and objective evaluation (written exam).

Level 2A–knowledge was to measure level of students` knowledge of IPE, communication, professional role and teamwork. A set of 22 true-false questions was constructed and a mean score of more than 14 correct answers was deemed to denote a satisfactory level of knowledge. This evaluation was performed at two points i.e. before and after the modules were delivered (T1 and T2).

Level 2B–attitude was to assess students` attitude on readiness toward IPL. This level was assessed using a questionnaire of readiness for interprofessional learning scale (RIPLS) in the Indonesian version. Parsell and Bligh (1999) developed the original RIPLS scale and this scale has good reliability and validity (47). Item answers were given on 5-point Likert scales (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree). The Indonesian version contains 16 items and has a good reliability with alpha coefficient > 0.8. The data collection was performed at T3, T4 and T5.

Level 2C-skill was to measure how the students' skills were employed in teamwork to manage a patient with chronic disease. Group performances were analyzed based on two

aspects i.e. (1) team atmosphere including trust, respect each other, and open discussion among team members and (2) team conflict covering conflict in relationship, task and process in the group.

This study adapted a scale of atmosphere team and team conflict (16, 45) that was translated into an Indonesian version. Item answers were given on 7-point Likert scales (1=very strongly disagree, 2=strongly disagree, 3=disagree, 4=neutral, 5=agree, 6=strongly agree and 7=very strongly agree). The both scales have a good reliability with alpha coefficient > 0.8.

Level 3 – student`s achievement to apply the new skills and knowledge on the practice.

The third level of evaluation attempted to determine the extent to which new knowledge, attitude and skills were implemented when caring for a patient in the home care service programme. Level 3 was to measure students` skills in communication, teamwork and group performance by tutors (46) and a team of tutors that consisted of four disciplines evaluated each student team. The evaluation was performed during both the simulation of IPE and the activities of the first patient visit.

Level 4 – result

This level was to evaluate the effect of the programme on students and the educational system in the FMHS (Level 4A) whereas the effect of the programme on patients and communities (Level 4B) was not measured in this study. The data for analysis for this level was obtained through exploration of tutors' group discussions and students' written comments.

Focus group discussion for tutors was categorized into five criteria (benefit, strength, opportunities, and threat of IPE as well as the recommendation for implementation IPE at FMHS). The students written comments consisted of four open-ended questions, and were

divided into four parts including (a) what are the competencies students needed to involve in IPL, (b) what barriers did students face in the programme, (c) did students gain new information or knowledge during interaction with other members, and (d) did students agree if this activity was integrated into the curriculum. Faculty staff facilitated the distribution of this questionnaire to all participants and we gave one week for the students to fill it in.

2.2.4 Instruments

In this study, we employed several instruments to evaluate the educational programme.

1. Student Satisfaction will be assessed using six items based on Ruona, Leimbach, Holton and Bates (2002) and Brehm, Smith and Rourke (2001).
2. Readiness for interprofessional learning. Readiness for interprofessional learning was measured by RIPLS scale(47).
3. Team functioning. Team functioning was assessed by team members on team conflict as well as the three aspects of team atmosphere including trust, respect and openness. Team functioning consisted of CIG and AIG scales (43, 45).
4. Perceptions of other professions. Perceptions of other professions were measured using items adapted from the Role Perceptions Questionnaire (73).
5. Knowledge of interprofessional concept. Students' knowledge of interprofessional concept was measured by a set of 22 true-false questions.
6. Team performance, communication skills and teamwork skills. Team performance, communication skills and teamwork skills for each student were assessed by team tutors.
7. Open ended questionnaires. This questionnaire was developed by researcher and faculty staffs and it consisted of 14 questions. The questions were divided into 4 part namely (a) information about patient visit; (b) students' reflection after discussion with other profession; (c) management patient; and (d) benefit and barriers during IPE programme.

2.2.5 Procedure of data collection

Quantitative Data

The quantitative component of the study was used to evaluate the impact of the educational intervention on student performance by using multiple scales. Faculty members who were not involved in this programme distributed five surveys to the each group at three different points in time. The time-one survey (T1) was given to each team member before programme was started and the second survey (T2) was carried out after delivering module on first phase finished. The time-one and second survey were to collect data of knowledge level. Furthermore, the time-third survey (T3) was given to each team member after the simulation IPL session finished. The time-fourth survey (T4) was given after all groups conducted discussion on the first patient visit and the last survey (T5) was carried out after discussion on the third visit patient activities. The time- third, fourth, and five were to gather data of attitudes, skills and behavior from participants.

Qualitative data

Because we currently do not have any information about benefit, barrier and impact of the IPL programme in Indonesia, we conducted an exploratory qualitative study and collected the information from students and tutors who participated in this programme. Our objective was to provide a view of the nature of IPL perceived by students and tutors. Indirectly, we wanted to find out: first, whether the initiative programmes would give a benefit for students and tutors; second, whether students and tutors deal with barriers during involving in this programme; and third, how this initiative programme would be implemented in FMHS. Thus, we used systematic, non-probabilistic sampling in order to discover the nature of IPL problems from students and tutors (74).

In order to gaining the fullest understanding of the participants` experiences in interprofessional team processes, a qualitative method was applied by distributing an open comment questionnaire for all participants after finishing the activities in third patient visit (T6). The collection of qualitative data from students were carried out after all activities in the third patient visit were done.

After finished all activities of COMIC programme, we invited all IPE`s tutor to conduct a focus group discussion to discuss about strength, weakness, threat, opportunity and recommendations for implementation of IPE at FMHS in the future. For tutor(s) who could not attend in this session, we distributed the form and asked tutor to fill in it.

The open comments, interview and comment from discussion were collected and qualitative thematic content analysis was conducted. The aim of the analysis was to identify group themes, which emerged from the participants` discourse. Recurring elements for each theme were gathered and grouped into separate categories. Then, within themes, specific elements of each analytic category were described.

2.2.6 Timeframe of data collection

The timeframe of intervention programme activities and data collection are described in Figure 2. Collecting data for evaluation of programme intervention was achieved through several methods as follows (a) written exam to assess the level of knowledge achievement; (b) students` self-assessment about satisfaction and benefit to the programme, team performance, and readiness for IPL; (c) assessment of student`s behavior by tutors with direct observations using a check-list form during patient visits, discussion and debriefing activities; (d) observation of students and tutors activities through video recording; and (e) written comments from students and tutors about the programme, benefit and barrier for individual, patient and institutions.

Following the Figure 3, data on the student's knowledge level were collected before the programme started (T1) and after delivering modules (T2), whereas student's satisfaction, conflict in group, group atmosphere, role profession and readiness for IPL were collected in three periods of measurement (T3, T4 and T5). Evaluation of student's skills by tutor's observation was carried out during the simulation model and during the first patient visit whereas data for Level-4 was collected at T6 through group discussion and open comment. The time gap of each phase was showed on Figure 3.

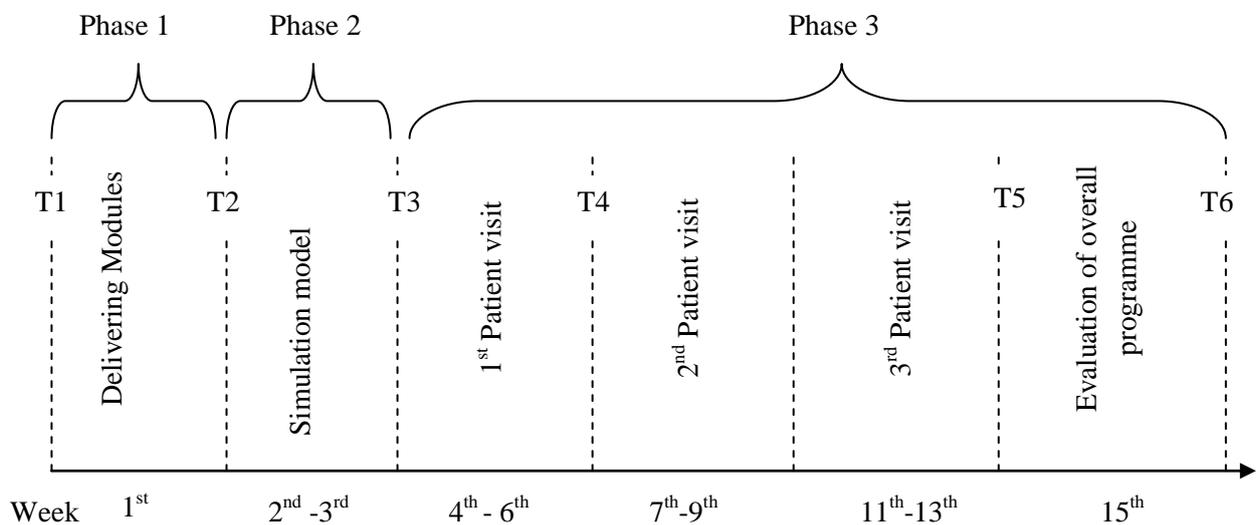


Figure 3 Timeframe of intervention activities and evaluation programme

2.2.7 Data analysis

Quantitative data analysis

Quantitative data were analyzed using SPSS for Windows version 16.1 (IBM Corporation, Armonk, New York). The descriptive analysis of students' characteristics and responses to the items on the some questionnaires used percentage and mean score. Assumption of normality and homogeneity of variance were checked and both of the results were satisfying for each dependent variable. Statistical significance was set at 5%. Before-

and-after comparisons for level of student`s knowledge and skill were performed with t-test. Changes in overall mean scores of satisfaction scale, RIPL scale, modified RPQ scale, CIG and AIG scale in three periods of measurement were assessed using repeated-measures ANOVA (RM-ANOVA). Effect size was measured using partial eta squared for RM-ANOVA and Cohen effect size (d) for t-test.

Qualitative data analysis

The aimed of the qualitative component of the study was to ascertain and analyze medical and health professional students' perceived about the COMIC programme and interprofessional learning and their tutors' perceptions about students' activities, COMIC programme and its implementation at FMHS.

The transcript from students' comments and focus group discussion were analyzed by thematic content analysis by using Burnard's concept (75). Thematic content analysis involves generating frequency counts of the dominant themes in a dataset that can be used to guide a thematic approach to analysis, which typically involves identifying themes within a dataset and comparing those themes to the study purpose and existing literature. The method employs step-by-step approach to coding and categorizing the transcripts by modifying the method of Burnard (1991) as well as Braun and Clarke (2006). The modification of Burnard (1991) and Braun and Clarke (2006) are summarized in Table 7.

Table 7 Modification of stages of thematic content analysis

Step	Description of the process	
	Data from focus group discussion	Data from open comment
1.	Transcription of taped and video interviews into original language (Indonesian)	Re-write the statements from open comment as like the original statement
2.	Transcriptions are read repeatedly and make some notes as a guide for the categorization of data.	The statements are read repeatedly and make some notes as a guide for the categorization of data.
3.	Transcription and the statements from open comments were translated from original language (Indonesian) into English	
4.	Transcription were then checked by a translator for accuracy	
5.	Re-read all statements and transcription to generate “headings” or “category system”	
6.	Making open coding from heading or category system	
7.	Listing all categories from open coding and collapsing into some “main categories”	
8.	Generate an initial list and develop “the initial codes” from the data.	
9.	Reviewed the initial coded and grouped into categories following the criteria (such as students’ opinions to integrate IPE into curriculum, benefit of this learning, required competencies in IPE, and barriers during IPE programme)	
10.	Re-read transcript/statements to check a true representation of the interview had been captured	
11.	Write up the findings alongside relevant literature and research	

In keeping with this approach, for each open-ended question, (1) written responses were initially classified for content and (2) a list of themes was generated. Finally, (3) all responses were coded using those themes. The response themes generated for each question from tutor’s group discussion were categorized into five criteria (benefit, strength, opportunities, threat, and recommendation). The responses from students were grouped into four criteria (students’ opinions to integrate IPE into curriculum, benefit of this learning, the required competencies in IPE, and barriers during IPE programme). Table 8 described step-by step how to develop the coding from the transcript of focus group discussion and the statement of open questions.

Table 8 Example: Step-by-step the developing of coding

Statements/transcript	Open coding	Collapsing categories	Coded for
I got experiences by visiting patient at home	Experiences... Patient visit...	1. Experiences...	1. Patient visit
I got experiences and insight how to discuss with other professions	Insight... How to discuss with ... Other professions..	2. Insight.... 3. Patient visit	2. Patient management
I know a different viewpoint from other disciplines about disease management	A different view point .. Disease management ...	4. Different professions 5. Disease management 6. How to discuss with ...	3. Benefit of programme
I can learn how to interact with different professions	How to interact.. Differen professions	7. How to interact.... 8. A different view point ...	

2.3 Ethical consideration

The research has been approved by the Committee of Ethics, The University of Tokyo (No: 3321) and Syarif Hidayatullah Islamic State University, Jakarta.

Students were given the written explanations and informed that their participation was anonymous and voluntary. Faculty members who were not involved in the research process facilitated the distribution of the questionnaires.

2.4 Funding

This research was funded in part by Academic Research Grant Programme (International) from the University of Tokyo (fiscal year 2010-2011). The funder had no role in the study design, data collection, data analysis, interpretation or writing of the study.

Chapter 3

Community-based Interprofessional and Collaboration (COMIC) Programme

This chapter have been published

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

Aauthors: Dwi Tyastuti, Hirotaka Onishi, Fika Ekayanti, Kiyoshi Kitamura

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Chapter 3

Community-based Interprofessional and Collaboration (COMIC) Programme

Chapter 3 describes in detail an educational programme related to IPE and collaborative practice in real settings. This chapter explains the elements of inputs required for the implementation of programme, the processes and activities of learning that were carried out, as well as the steps of learning evaluation to assess the impact of the programme on participants and faculty. We developed the COMIC programme as new IPE initiative in Indonesia.

3.1 Determination of the IPE programme

The literature review was undertaken during development of the programme to learn the IPE concepts at primary care setting that have been utilized and identify the most relevant IPE model for current condition in Indonesia. The previous studies suggested that the implementation of IPE programme in primary care setting need to consider some key elements i.e., (a) IPE intervention was not based only on educational theory, but also applied theory of psycho-social learning; (b) implementation of various learning methods in the programme is in accordance with the achievement of each learning objective; (c) the programme was executed as longitudinal study; and (d) used various evaluation tools to evaluate the effectiveness of the programme and assessed the achievement of the interprofessional competencies among learners (21-23, 76).

3.2 Development of the programme

Community-based Interprofessional Collaboration (COMIC) programme was an educational programme of IPL in CBHC to promote IPE and collaborative practice in

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

In the situation of the current dynamic health care environment, practitioners are required to have the ability of self-direct learning, develop critical thinking, capability to apply reflective practice, and work in groups (2, 77). Currently, traditional learning such as lecture in classroom is not adequate to achieve those competencies. The active, applicable, and self-reflective learning has been proven to achieve those outcomes. Therefore, in designing the curriculum of this programme, we utilized various learning theories and psycho-social domains (22), using multiple teaching methods, and applying several scenarios and cases in accordance with the real conditions in Indonesia as learning tools.

In this simulation, we introduced a new initiative to actively involve disciplines of pharmacy and public health in home care services model to strengthen and improve the quality of health services for patient and community. Currently, doctor, nurse and midwife are carrying out home visits to treat patients only. Because some health centers in several regions in Indonesia have staff members consisting of pharmacist and public health workers, therefore this model provides considerable benefits and effectiveness for the treatment of particular health problems that require comprehensive care.

Figure 4 summarized the whole programme including preparation phase, activities, duration for each phase, and evaluation.

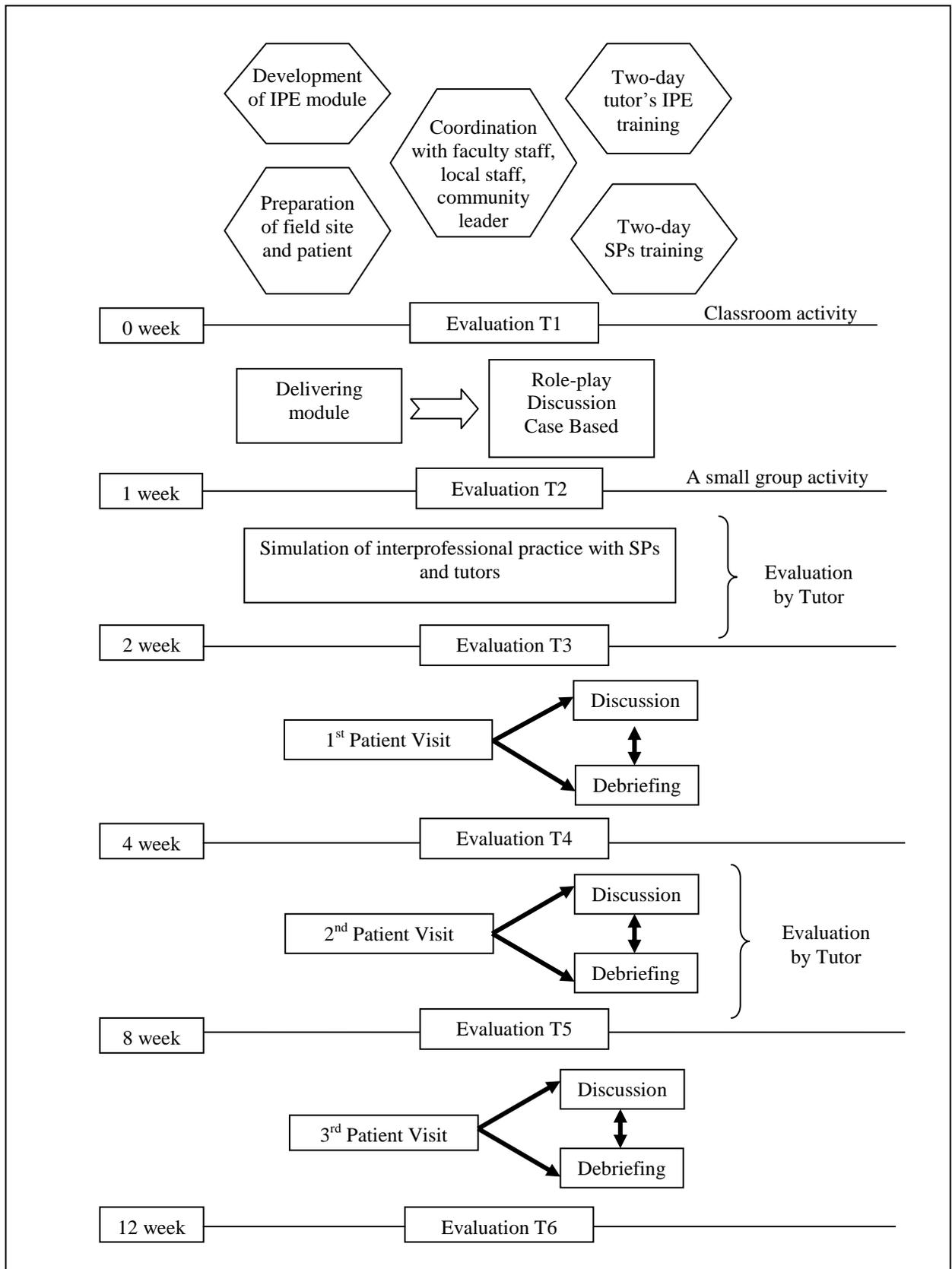


Figure 4 Framework of intervention activities and evaluation programme

3.3 Preparation Phase

3.3.1 Students

Students of third year-study were recruited as volunteers by filling out application forms distributed in each class. Eighty students volunteered to participate in this activity, and from such number twenty students represented each discipline. Students were divided into 20 teams with equal numbers and each team consisted of students from four disciplines (medical, nursing, pharmacist and public health). All students have experiences working in community because each discipline delivered modules of community or public health such as community medicine, family health nursing care, community diagnosis (public health) and pharmacy community modules.

3.3.2 Tutors

Tutors who participated in this programme were volunteers and they were involved in a two day workshop of IPE training for tutors. Thirty faculty members from four disciplines were committed to be involved in this programme but only 22 tutors attended the workshop. The workshop delivered modules of IPE and collaboration practice concept, 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 programme, 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 simulation session, debriefing activities and patient visits.

3.3.3 Simulated or standardized patient (SPs)

We invited twenty people who live near the campus area to participate in this programme as SPs. They have different 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 applied two stages of the SPs training i.e. at the first stage, the SPs practiced using the scenario of the disease that he/she had suffered, and at the second stage, SPs followed the scenario constructed by the programme. During the training, SPs practiced role-plays with other SPs and with tutors. One day before simulation session, the SPs returned to practice using the scenario that was used in simulation session.

3.3.4 Real patient

In interprofessional practice session, we involved 25 real patients who suffered or had the history of chronic disease such as diabetes mellitus, hypertension, and pulmonary obstructive chronic diseases. In preparation stage, a faculty staff member and a staff member of Primary Health Center (*Puskemas*) coordinated to determine a village and patients for this programme, and conducted a visit to the house of a patient who was willing to participate in this programme. This visit was important to explain the programme, the roles of patients and family members during implementation of programme and to ask permission from patient and family members if they would like to participate in this activity.

3.3.5 Supportive learning environment

In IPL, informal and hidden curriculum is an important domain so that the learning process occurs in nature, interactive and student-centered (78). Therefore, this programme

creates a supportive environment to sustain the learning process by setting up the schedule of tutors on duty (only every Friday), adequate facilities and infrastructure such as classroom and its equipment, books, computers, CD-learning and free access for wireless-internet and all are available on weekdays and Saturdays.

3.3.6 Development of the scenario

Simulation session was driven by a case (case-based concept). Researcher, tutor, and other faculty staff members constructed the scenario. For simulation activity, we chose a case of diabetic foot ulcer due to (a) currently, diabetes mellitus is the first chronic disease in Indonesia and (b) there are multi determinant factors influencing this case so that the students can deeply analyze from viewpoint of each profession and solve this case comprehensively. For management patient, students suggested some medical and nursing cares such as giving some medical treatments, how to treat the diabetes ulcer patients, and prevention to further complication. Students made a plan for promotion and prevention for a patient and his/her family. All these activities were aimed to train students to develop a holistic thinking and an integrated management care.

3.3.7 IPE modules for tutor and students

We prepared modules for tutors and students who participated in this programme. The modules were modified from modules that have been developed other institutions (79-81) including communication skills for patients and colleges, empathy, professionalism, team process, social-culture adaptation and the role of profession.

3.3.8 Community field

The community site for interprofessional practice was a sub urban residence. This site was chosen by this study because it was close to the faculty building so that it facilitated tutors to assist students during interprofessional practice, and the community leader and the patients' families allowed our students to visit them more often to collect data, discussion, and conduct physical examination.

3.4 Implementation

The programme consisted of three phases (Figure 4) and all students were expected to be involved in all phases. Total days for all activities were ten in three months and all activities were held on Friday afternoons for workshops and Saturdays for simulation sessions and visiting patient's home.

3.4.1 Phase 1

Phase 1 was aimed to develop student's cognition about IPL and collaborative working with different professions. As a new programme, this phase was also aimed to prepare students to adapt with new learnings such as learning in a group, learning with different professions, the active learning model and patient visit activity. In the first phase, we prepared 7 modules which intention was for the briefing of knowledge for participants who volunteered to participate in this educational programme. All modules were delivered within 4 days effectively (Table 9). Based on the findings from the literature, to overcome obstacles in introducing new programmes and to help students cope with this, consequently delivering of new concept was conducted prior to the implementation of the programme.

Table 9 Activity of phase 1: modules, teaching method and duration of learning

Date	Duration	Title	Teaching method
1 st day	2 hours	IPL and benefit for health profession	Lecture, group discussion
	2 hours	Role profession in interprofessional practice and professionalism	Lecture, discussion
2 nd day	2 hours	Ethics, empathy and social culture adaptation	Lecture
	2 hours	Community based health care and home care	Lecture, problem solving
3 rd day	4 hours	Interpersonal communication for patient and other health professions	Role play
4 th day	4 hours	Team building and group dynamic	Lecture, role play

In order to achieve the learning objectives, the programme implemented the active learning methods and focused on student learning. As previous studies showed that the concept of adult learning and problem solving were effective in IPL (22, 77), then this programme applied various teaching methods such as:

a. 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 (82). 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.

b. Ice-breaking activity

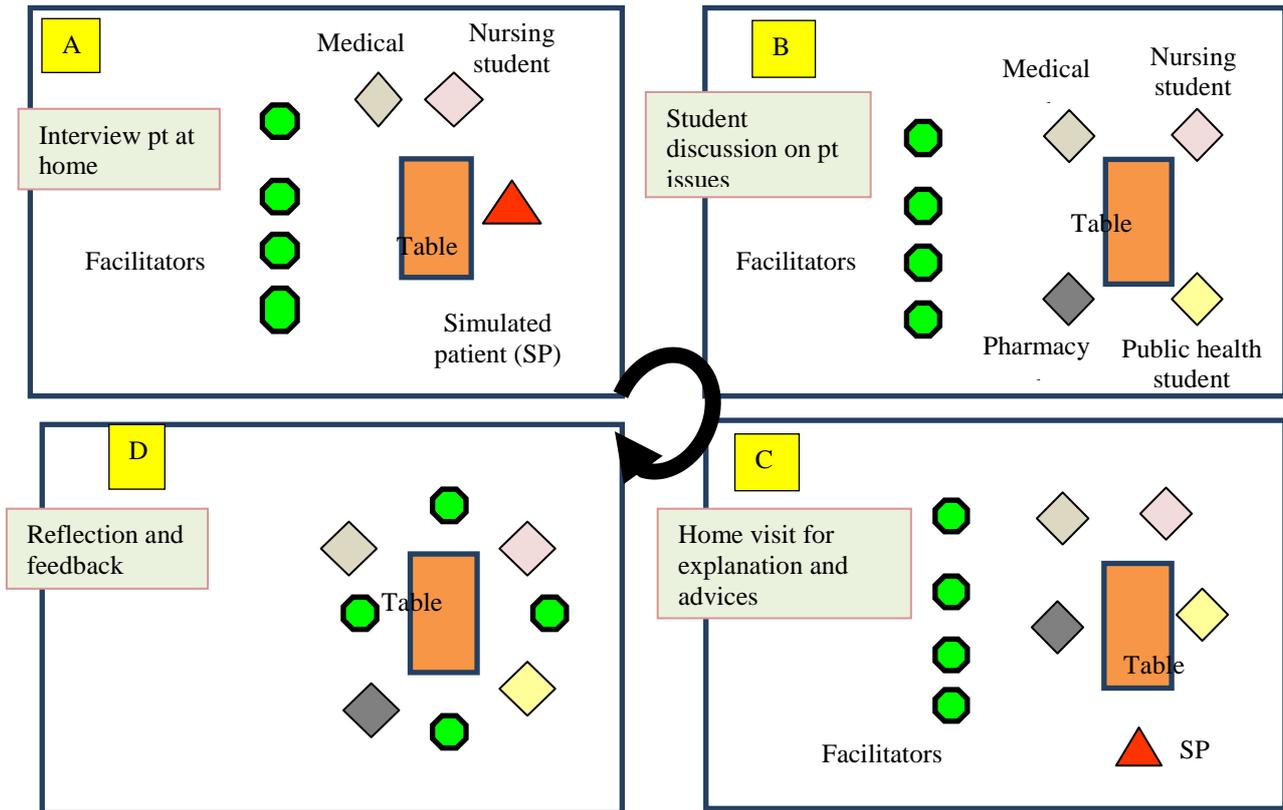
As a learning that united students from various disciplines, then the early stage is the important phase of IPE implementation. Many studies suggested that students who were

involved in IPE learning would feel frightened and discomfort (83) and it would arose tension when students met each other for the first time (83) due to the presence of differences in social-culture, professions and roles, as well as educational background. In this study, the strategy to reduce tensions among members of the team and help participants in the process of social adaptation was the implementation of the concept of ice-breaking activity with various learning methods such as role play, team-building activity and game of dynamic-team and working in group from the beginning (see Appendix 3).

3.4.2 Phase 2 - Simulation model of IPE

Phase 2 is aimed to develop student's skill to be able to practice in the real setting. To achieve the objectives in the second phase, we developed a simulation-learning model to prepare students before practicing in the real setting. This phase employed the principles of experiential learning and situated learning, with which this programme developed a simulation programme that is similar to real conditions as in the field. By implementation of this simulation model, students can learn the model of IPL and patient visits in home care services.

Model of IPL simulation in this programme was based on the model of patient visit on primary care services in Indonesia. Simulation was divided into 4 sessions (Figure 5) and each group participated in all sessions. Sessions A, B, and C were conducted for 20 minutes for each session and session D was carried out for 30 minutes. The simulation session involved students, tutors, and SPs and was driven by a scenario. Family record and discussion forms were distributed to all participants as guidance for each group in collecting data from SPs. All sessions were recorded from the beginning until the end for each group and the recording was used by the students and tutors for self-evaluation and reflection after simulation session.



Description of simulation and practice of interprofessional intervention

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

Session B: Medical and nursing students discuss with other members about the patient's and family members data that were collected in the first session. They discussed by following the discussion form. Tutors observed and evaluated student's activities during group discussion. After the discussion, the group made conclusions about patient's problems, cause of problems, lack of data, and recommendation(s) for patient/family members.

Session C: all members visit patient's home to inform about patient's problems and group's recommendations. Tutors observe and evaluate group's activities during this session

Session D: This session is called debriefing and reflection session. Students and tutors discussed data finding and group's recommendation. Tutor's role was to guide students to reflect what students learn during the programme.

Figure 5 Learning model of COMIC programme

3.4.3 Phase 3: Practice in real setting

Third phase constituted an interprofessional practice model in which each group visited a 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 in each visit. This mentoring model was applied 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 general physical examination including measurements of blood pressure, body temperature, body weight and height, and other specific physical examinations if they found abnormality such as wound, ulcer, tumor, and 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 for 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 patient. The revisit was for interview only.

The second visit was intended to convey the patient's problem and group's recommendations for such patient and his/her family members. Before conducting the second visit, students and tutors performed group discussion that we called debriefing and reflection sessions. In this discussion, students presented their findings and their recommendation for the patient and his/her family members. After this session, tutors evaluated students, group's performance, and the group's report.

When a group carried out the second visit, all group members visited the patient and his/her family members. A group explained the purpose of the visit, the patient's and his/her family members' problems that were found in the first visit, and group's recommendation.

The third visit was carried out a month after the second visit. This activity was aimed to: (a) follow up the condition of the patient and evaluate the group recommendation's impact to the patient and/or his/her family members' condition; (b) whether the patient and his/her family members implemented the recommendation(s) from students; and (c) how far the impact of the recommendation improved patient's health status or what the patient's and his/her family members' perception about the students' recommendations. Each group performed a discussion for debriefing and reflection after the patient visit to discuss the findings and reported the entire programme. Each group made a report that consisted of the patient and his/her family members' information, group analysis about the patient's and his/her family members' problems, and group recommendation for the patient and his/her family members. IPL is a learning that requires the integration of knowledge, attitudes and skills. Therefore, to help the students develop that skill, the programme emphasized the reflection activity in debriefing process and informal activities.

Reflection activity in debriefing

The previous studies showed that the learning process by reflection and debriefing activities were considered as useful for students to get the most from their education (84, 85). Like we all realized that students who have reflective individuals are few, so applying reflective activities in debriefing process has assisted students to link theory to the practice or otherwise connected the experience gained with the existing theory, critically thinking and to discuss how to perform professionally in a complicated condition (84, 86). Although the learning process in this programme was delivered in various methods (such as interactive

lecture, simulation and task training in contextual and repetition), the meaningful learning process occurs when deep insight were created explicitly through reflection during debriefing (87).

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. A tutor team from four disciplines facilitated each debriefing session. During this session, the tutor guided students to present and discuss group`s findings from the first and second visits, group planning and group recommendations for the patient and his/her family members. In addition, students were encouraged to express the difficulties met during visitations and interactions in groups. This process was important to assist students in IPL such as the process of communication among individuals and groups, team dynamics and performance, reduce conflict within a team, and respect for others roles professions as well as to integrate knowledge, attitude and skills.

Informal activities

The previous studies showed that informal activities were the important factors for the success of IPE intervention and for supporting of learning process in IPE(78). Therefore, we set the programme schedule to be more flexible, provide facilities for this activity that available on Monday until Saturday, and encourage students to maximize the use of free video conference as a medium for discussion among students or with tutors.

Chapter 4

Study 1 – Validation Scales: Result and Discussion

Chapter 4 presents an overview of preliminary study for psychometric items analysis and validation scales that was translated into the Indonesian version. The aim of the study is to describe the psychometric properties, reliability and validity of all scales of the Indonesian version adapted from the original scale through cross-cultural process. To our knowledge, there is no information on all scales that is used in this study in Indonesia. This study adapted the readiness for interprofessional learning scale (RIPLS), conflict in group (CIG) scale and atmosphere in group (AIG) scale that were used in main study. The item analysis employed EFA (exploratory factor analysis) and CFA (confirmatory factor analysis).

4.1 Descriptive result

Table 10 showed the distribution of participants who were involved in this study. The numbers of female students, both in the first and second surveys, were higher than male students and it was related to the proportion of students who enrolled at FMHS currently, in which the proportion of female and male was 3:1. The main factors that caused the differences of proportions among respondents in this study were (a) the study location (not in the same building, the activities in the community or hospital) and (b) the different schedule. For example, the first and second year of nursing students could not participate in filling out the questionnaire since they were carrying out learning activities outside the faculty building which date coincided with the date of filling out the questionnaire determined by the faculty.

Table 10 Characteristics of participants who involved in psychometric study

Indicator	First Survey (N=302)		Second Survey (N=755)	
	Number	Percentage	Number	Percentage
Sex				
Male	104	34.7	195	25.8
Female	198	65.3	560	74.2
Discipline				
Medicine	186	61.3	230	30.5
Nursing	40	13.3	46	6.1
Pharmacy	40	13.3	225	29.8
Public Health	36	12.0	254	33.6
Year-study				
First year	85	28.0	345	45.8
Second year	217	72.0	217	28.7
Third year		-	193	25.5

First Survey

Among 320 questionnaires, 302 valid data were collected and have met the minimum criteria of total sample for EFA and CFA analysis. Excision of a number of questionnaires was done in the analysis of this study that was aimed to meet the requirements of analysis either by using EFA or CFA. A total of 18 questionnaires were excluded from the analysis for further analysis for the following reasons: (1) 7 questionnaires had missing items and result of the missing value analysis (MVA) showed that MCAR values were >0.05 , which means that the missing value is not random, (2) for analyzing outliers univariate, 11 questionnaires had Z-score values of less than -3 and more than +3 (41).

Distribution of respondents by gender showed that the number of female students (n=198, 65.3%) was higher than that of male students (n=104, 34.7%). The number of medical students (61.3%) who participated in this study was greater than those of public health students (13.3%), nursing students (13.3%), and pharmacy students (12.0%). Second year (72.0%) who participated in this study was higher than first year students (28.0%).

For analysis of data normality, after excluding non-valid questionnaires, Table 1 representing such data (302 samples) was normal indicated by the value of skewness <3 (between -0.795 to +0.950) and kurtosis <10 (-1.800 to +0.934)(41). The presence of multicollinearity of medium level in the data was indicated by a value of 32 from sample moment calculation(55), and there was no singularity ($r > .95$) on those items from the analysis result by AMOS (Analysis of Moment Structures).

The total samples ($n=302$) were randomly divided into 2 split-half samples by SPSS 16.0, number of samples for each analysis (EFA or CFA) was 151 samples. Data from the sub-sample ($n=151$) were analyzed by EFA with maximum likelihood methods and oblique rotation. Acceptance of EFA was checked with three well-recognized criteria for EFA analysis, the Kaiser-Meyer-Olkin (KMO), Bartlett's test of sphericity (α), and the diagonals of the anti-image correlation matrix. Two criteria were set up to retain factors produced by EFA i.e eigenvalues > 1 and scree plot evidence (57).

The second sub-samples ($n=151$) were used for the analysis of factor structure using CFA. In this study, CFA procedure with maximum likelihood estimates (42) and the goodness-of-fit (GOF) of the model was evaluated by multiple criteria (42, 53).

Second survey

We distributed 800 questionnaires and of 776 questionnaires were returned. After screening the questionnaires, 755 valid questionnaires were collected. Excision of a number of questionnaires was done in the analysis of this study that was aimed to meet the requirements of analysis either by using EFA and CFA.

A total of 21 questionnaires were excluded from the analysis for further analysis for the following reasons: (a) 8 questionnaires had missing items and result of the missing value analysis (MVA) showed that MCAR values were >0.05, which means that the missing value

is not random, and (b) analyzing of outliers univariate was found that 13 questionnaires had Z-score values of less than -3 and more than +3 (41). In total, 755 valid questionnaires met the minimum criteria of sample (41) or a minimum sample size of 200 for any SEM (88), then the next step was to conduct the CFA analysis.

Among 755 valid questionnaires, the proportion of female student (n=557, 73.8%) was higher than of male students. Students who participated in this study were from public health (33.6%), medical (30.5%), pharmacy (29.8%) and nursing (6.1%) courses. Participants consisted of first-year students (45.8%), second-year students (28.7%) and third-year students (25.5%). Overall, the number of first-year students (45.80%) who returned the questionnaires in this study was higher than of second-year students (28.70%) and third year's students (25.50%).

The total samples (n=755) were randomly divided into 2 split-half samples by SPSS 16.0, one for EFA (n=377) and one for CFA (n=378). Data from the sub-sample (n=377) were analyzed by EFA on 18 items of the Indonesian version with maximum likelihood methods and oblique rotation. Acceptance of EFA was checked with three well-recognized criteria for EFA analysis, the Kaiser-Meyer-Olkin (KMO), Bartlett's test of sphericity (α), and the diagonals of the anti-image correlation matrix. Two criteria were set up to retain factors produced by EFA i.e eigenvalues > 1 and scree plot evidence (57).

The second sub-samples (n=378) were used for the analysis of factor structure using CFA. In this study, CFA procedure with maximum likelihood estimates (42) and the goodness-of-fit (GOF) of the model was evaluated by multiple criteria (42, 53).

Table 11 EFA result of CIG scale: mean, SD and loading factor (n=151)

Items	Mean (SD)	Skewness	Kurtosis	Subscale	
				1	2
1. There is a lot of friction among team members.	4.54 (1.15)	0.016	(0.052)	.861	-.269
2. There are personality conflicts evident in my team.	4.92 (1.20)	(0.194)	0.026	.889	-.059
3. There are tensions among members of my team.	5.07 (1.13)	(0.158)	0.029	.899	-.039
4. There are emotional conflicts among members of my team.	5.18 (1.08)	(0.044)	(0.136)	.869	-.020
5. Members in my team disagree with opinions regarding the work being done.	4.95 (0.6)	0.185	0.151	.634	.108
6. There are conflicts about ideas in my team.	4.64 (1.05)	(0.107)	(0.035)	.316	.401
7. There is a conflict about work in my team.	4.78 (0.99)	(0.017)	0.274	.304	.561
8. There are differences of opinions in my team.	3.54 (0.99)	0.296	0.130	-.251	.483
9. There are disagreements about who should do what in my team.	4.34 (1.02)	0.314	0.171	-.069	.809
10. There is a conflict about task responsibilities in my team.	4.61 (1.03)	(0.076)	0.147	.234	.686
11. There is a disagreement about resource allocation in my team.	4.49 (0.99)	0.129	0.134	.159	.659
Total variance explained (65.1%)				53.8	11.4
Reliability of each sub-scale (α total .91)				.90	.84

4.2 Result of factor analysis of CIG scale

EFA result

EFA of the Indonesian version CIG scale was performed by using promax rotation method with maximum likelihood. All items in the Indonesian version were included in analysis factor by EFA based on result of the Kaiser-Meyer-Olkin (KMO) Measure Sampling Adequacy for 0.906, Bartlett's Test of Sphericity was significant (<0.001), and the value of the correlation (r) of the anti-image correlation for all items were between 0.766 – 0.930 (standard $r > .55$). By promax rotation method, CIG scale in the Indonesian version formed two subscales based on eigenvalue >1 and scree plot graphs.

Unlike the original version (43), subscales of the Indonesian version consisted of first factor (items 1-5) and second factor was formed by items 6 to 11 (see Table 11 and Figure 6).

Only item 8 (*there are differences of opinions in my team*) yielded factor loading < 0.5 (see Table 9). Factor that was accounted for the greatest variance was first factor (53.8%) of the total variance (65.1%).

Table 11 showed that factor loading of the first factor ranged from .634 – .899 and the item with the highest factor loading was item 3 (*There are tensions among members of my team*). On the second factor, item 9 (*There are disagreements about who should do what in my team*) possessed the largest factor loading (.809) and factor loading of each item on this subscale was between .401 - .809. Internal consistency test showed that Cronbach’s alpha of CIG scale was 0.90 (first factor) and 0.84 (second factor).

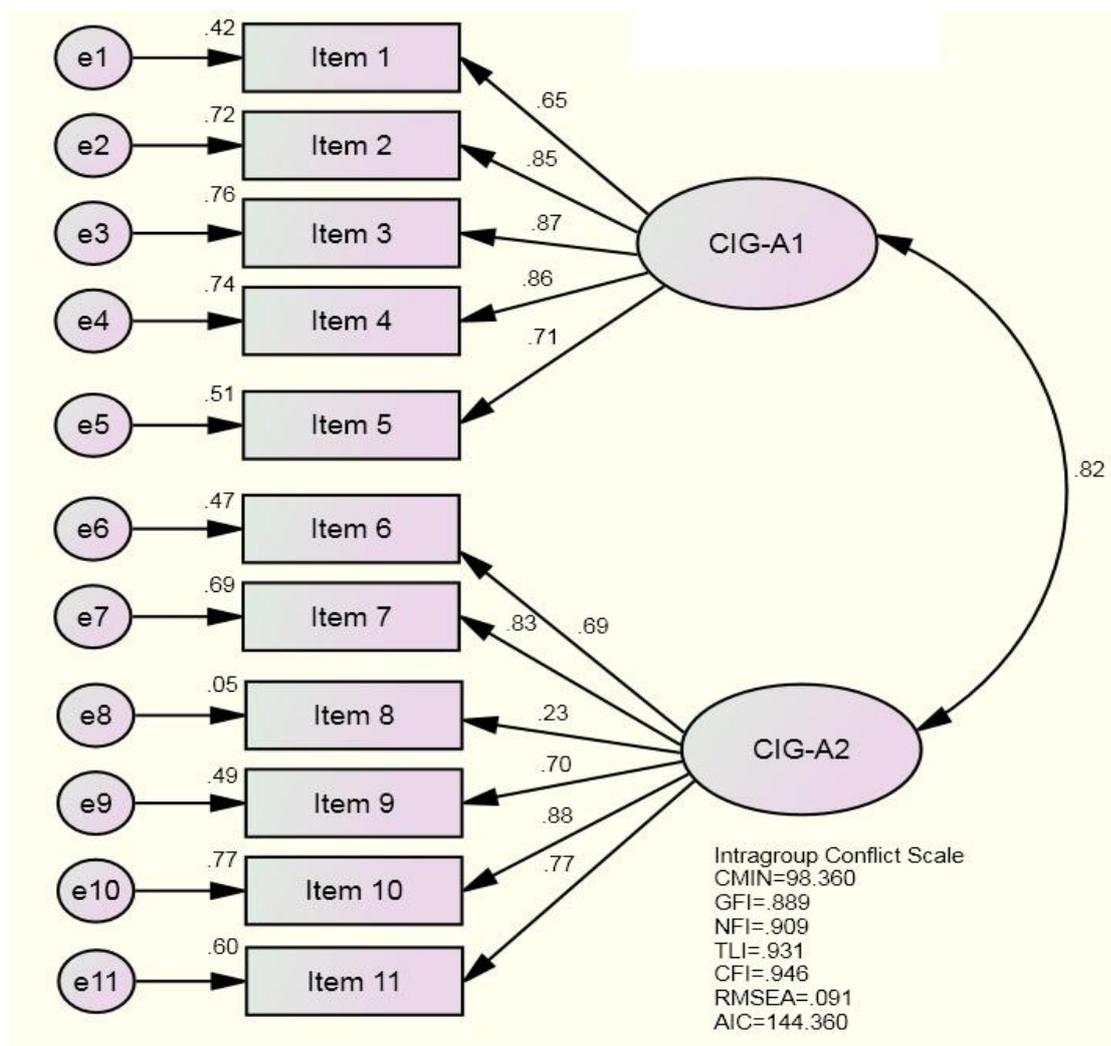


Figure 6 Measurement model of two-factor model (initial model) of CIG scale

CFA result

Initial model (Figure 6): The initial model was a measurement model derived from the results of EFA. In Figure 6, the two-factor model with 11 items (CIG-A1: items 1-5; CIG-A2: items 6-11) evidenced that t-value of all items was significant ($p < .001$) and all loading factor of items were >0.5 (except item 8, factor loading is 0.23), suggesting that items 8 was not represented in the construct being measured. Therefore, the initial model was not a fit model since there was a value of factor loading <0.5 (42) hence the modification of the measurement model at the later stage was done by eliminating the item 8.

The second step, because the initial model was not a fit model, we conducted CFA according to the original study. From the original study, we analyzed three-factor version 11 items. Unfortunately, see Table 12, this model was not a fit model due to item 8 generated low loading factor (<0.5) though the goodness of fit index met the criteria.

Table 12 Reliability, validity and fit indices of CIG scale (n=151)

Indicator	Reliability-Validity			Index Fit						AIC
	α	CR	AVE	CMIN/df	NFI	TLI	CFI	RMSEA	SRMR	
1. Initial Model (11 items)										
CIG -A1 (item 1 – 5)	.89	.89	.63	2.29	.91	.93	.95	.09	.05	144.36
CIG -A2 (item 6 – 11)*	.84	.85	.51							
2. Second Model (11 items)										
CIG -B1 (item 1 – 4)	.91	.89	.66	1.979	.93	.95	.96	.08	.05	131.58
CIG -B2 (item 5 – 8)†	.69	.75	.47							
CIG -B3 (item 9 – 11)	.89	.85	.65							
3. Third Model (10 items)										
CIG -C1 (item 1 – 4)	.92	.89	.69	1.864	.94	.96	.97	.08	.04	105.63
CIG -C2 (item 5 – 7)	.86	.87	.69							
CIG -C3 (item 9 – 11)	.89	.89	.72							

(*). (†)= item 8 of IC scale has loading <0.5

Initial model=based on EFA result; Second model=based on original study; Third model=based on CFA result

Three-factor version, 10 items (Figure 7): Item 8(*There are differences of opinions in myteam*) was removed based on the value of loading factor <0.50 of the initial model. The three-factor model with 10 items (RC was represented by items 1 to 4; TC consisted of items 5 to 7; PC formed by items 9 to 11) was analyzed and all values of factor loading ranged between $.680$ and $.894$ (Table 10). Notwithstanding Hugh (2001) suggested that the best loading factor was $>.7$ however the loading factor $>.5$ was also quite satisfactory, especially in the explorative research(56). Therefore, we retained all items (10 items) for further analysis and modification of models. Despite item 1 produced loading factor <0.7 , the item contributed highly to construct measured. In addition value of the Normed chi-square(32, N = 151) = 59.63) was significant ($p<.005$). Results of Chi Square (1.864) and GOF indices (GFI=.920, TLI=.961, NFI=.943, CFI=.973, RMSEA=0.080 and SRMR=0.039) met the criteria, indicating that the three-factor model (10 items) was a fit model.

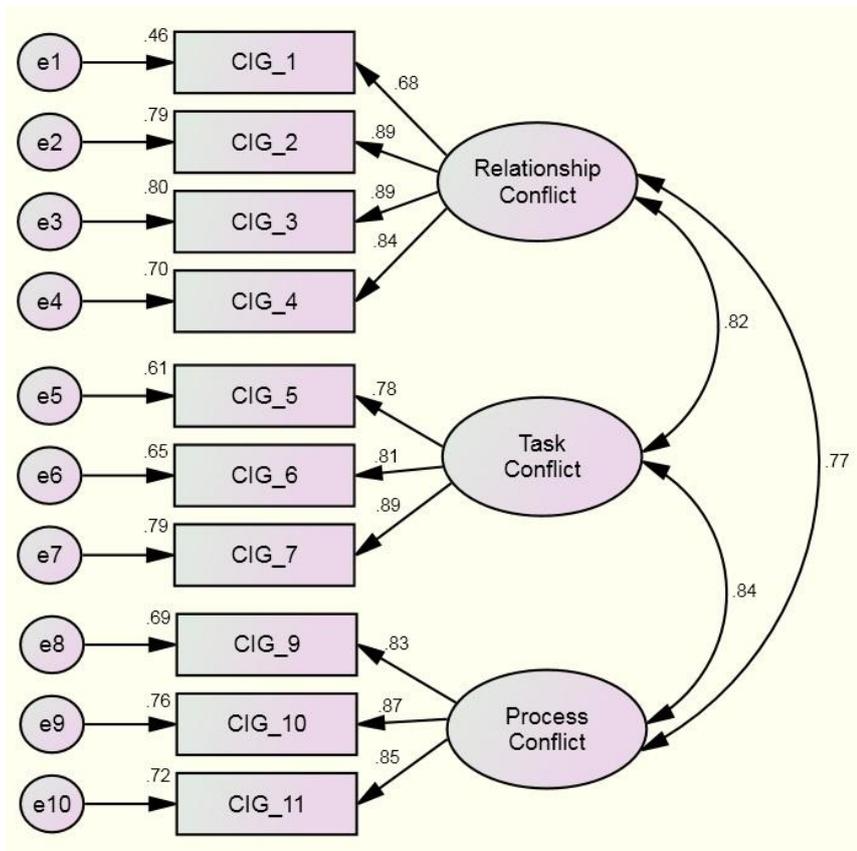


Figure 7 Measurement model of 10 items of three-factor model of CIG scale

Assessment of fit of internal structure of CIG scale model

Reliability analysis pointed out that the overall Cronbach's alpha for the initial model and modified model was 0.91 and 0.92. By deleting item 8, the overall Cronbach's alpha of modified model was higher than the initial model. Cronbach's alpha values for three factor of modified model ranged from 0.86 to 0.89 (see Table 12). Those results denoted that the modified model (three-factor model) had high levels of internal consistency to measure group conflict in IPL and collaborative. Furthermore, AVE and CR were calculated to check convergent validity of measurement model. CR values for each construct of three-factor model were >0.7 and RC factor produced highest CR than other factors. This study showed that the reliability values of all constructs by either Cronbach's alpha or CR were almost similar. AVE values for each construct of three-factor model were found as an acceptable level that ranged from 0.69 to 0.72.

Table 13 Analyzing of discriminant validity on three-factor model of CIG scale (n=151)

Three factor model	RC	TC	PC
RC	0.69*		
TC	0.67	0.69*	
PC	0.59	0.70	0.72*

Notes: *Diagonal elements report of the AVE, and other matrix entries report the squared correlation estimation between them
 RC=relationship conflict; TC=task conflict; PC=professional conflict.

Discriminant validity upon a scale was tested to check the confidence in subsequent research findings (65) to confirm unidimensionality of each construct. Discriminant validity is demonstrated if the AVEs of both constructs are greater than the squared correlation (65, 66). This study used this method to determine whether the constructs in three-factor model were different from the others. Focusing in Table 13, the results show questionable discriminant validity for constructs of TC since AVE of TC (0.69) was lower than square correlation

between TC and PC (0.70). Only construct of RC and PC indicated acceptable discriminant validity because the AVE was greater than the squared correlation. The results evidenced that RC and PC were unidimensional.

4.3 Result of factor analysis of AIG scale

EFA result

EFA on 8 items was accepted because three measures met the criteria. Kaiser-Meyer-Olkin (KMO) measure sampling adequacy was 0.907, above the recommended benchmark of 0.6. Bartlett's test of sphericity was significant, i.e. ($\chi^2(28) = 1643, p < 0.0001$). Thirdly, the diagonals of the anti-image correlation matrix for all items were between 0.866-0.938, above the standard of 0.5. By using promax rotation with maximum likelihood, EFA of AIG scale produced only one factor (Table 14) and this result was different from the original study (45). The total variance was 62.0%. The factor loadings for items ranged from 0.628 to 0.837 and the item with the highest factor loading was item 6th (*in my team we discuss issues openly*). Table 14 showed that the Cronbach's α of AIG scale had a value of .92.

Table 14 Loading factor of AIG Scale by EFA (n=151)

Items	Mean	Skewness	Kurtosis	Subscale 1
1. Members in my team trust each other.	5.25 (0.84)	0.269	0.212	.628
2. Members in my team feel comfortable delegating to others in the team.	5.14 (0.79)	0.382	0.440	.648
3. Team members are truthful and honest.	5.25 (0.78)	0.599	0.630	.787
4. Team members respect each other.	5.40 (0.82)	0.482	0.079	.825
5. Team members respect each others' ideas.	5.40 (0.87)	0.027	0.181	.768
6. In my team we discuss issues openly.	5.36 (0.78)	0.436	0.105	.837
7. In my team we communicate openly.	5.40 (0.78)	0.367	(0.004)	.794
8. In my team conflicts are dealt with openly.	5.20 (0.87)	0.128	0.167	.714
Total variance explained				62.0
Reliability of each sub-scale				.92

CFA Result

The EFA's analysis was followed by CFA for the Indonesian version to examine reliability and validity of the scale and generated fit model of the Indonesian version. In this study, an initial model (which was consisted of eight items) was a measurement model derived from the result of original study (45) because the result by EFA only produced one factor. The 8 item one-factor version was not a fit model due to generated the goodness of fit index that unmet the criteria.

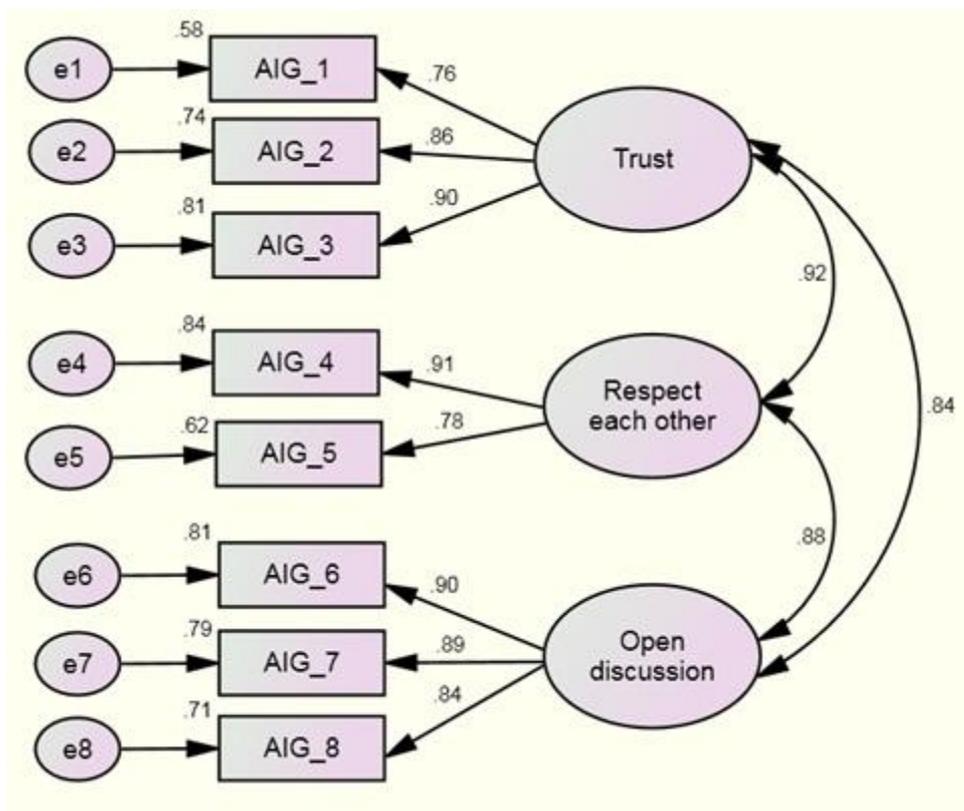


Figure 8 Measurement model of 10 items of three-factor of AIG scale

The original study produced three-factor model of atmosphere group scale that consisted of factors of trust, respect each other, and open discussion. In Figure 8, the three-factor model with 8 items (F1: items 1-3; F2: items 4-5; F3: items 6-8) evidenced that t-value of all items was significant ($p < .001$) and all loading factors of items were > 0.5 . Fit indices

showed that all criteria of fit index were more than the benchmark. This initial model was decided as a good measurement model of AIG scale because all items produced loading factor of more than 0.7 and satisfied for all index goodness of fit (Table 15).

Assessment of internal structure of a model

Reliability analysis pointed out that the overall alpha coefficient of the AIG scale model was 0.92, and alpha coefficient for each factor were 0.84, 0.87, and 0.89 respectively for factors of trust, respect and open discussion. Furthermore, average variance extracted (AVE) and composite reliability (CR) were calculated to check construct validity of the measurement model. Table 15 shows that CR values for each construct of the AIG model were satisfied (>0.7) (42, 65). AVE of each factor is expected to be > 0.5 and this study showed that AVE for all factors met criterion. Thus, the three-factor of AIG version had a good construct validity.

Table 15 Reliability, validity and fit indices of AIG scale (n=151)

Factor	Model measurement of AIG scale				Reliability - Validity			Index Fit
	LF	SE	t-value	R ²	α	CR	AVE	
Trust ↔ Respect	0.919	0.074	7.049					CMIN = 48.53 (df=17)
Trust ↔ Open	0.840	0.066	6.660					
Respect ↔ Open	0.877	0.065	6.871					
Trust factor					0.87	0.88	0.71	CMIN/df = 2.855
Item 1 ← Trust	0.763	0.065	13.755	0.583				GFI = 0.962
Item 2 ← Trust	0.858	0.077	11.141	0.735				AGFI = 0.921
Item 3 ← Trust	0.900			0.810				NFI = 0.971
Respect factor					0.84	0.84	0.73	TLI = 0.968
Item 4 ← Respect	0.915			0.836				CFI = 0.981
Item 5 ← Respect	0.784	0.073	11.687	0.615				RMSEA = 0.078
Open factor					0.91	0.91	0.77	SRMR = 0.022
Item 6 ← Open	0.900			0.810				
Item 7 ← Open	0.888	0.064	14.972	0.788				
Item 8 ← Open	0.844	0.075	13.549	0.713				

Table 16 shows the discriminant validity of three-factor model of AIG scale. The results indicated the questionable discriminant validity for all constructs because the AVE of those constructs (TR, RO, and OD) were lower than square correlation between each constructs. The results evidenced that TR, RO and OD were two-dimensional.

Table 16 Analyzing of discriminant validity on three-factor model of AIG scale (n=151)

Three factor model	TR	RO	OD
TR	0.71*		
RO	0.85	0.77*	
OD	0.71	0.77	0.73*

Notes: *Diagonal elements report of the AVE, and other matrix entries report the squared correlation estimation between them.

TR= Trust; RO=respect each other; OD=open discussion

4.4 Result of factor analysis of RIPLS scale

EFA Result

For analysis of data normality, after excluding non-valid questionnaires, Table 10 representing such data (755 sample) was normal indicated by the value of skewness <3 (between -0.795 to +0.950) and kurtosis <10 (-1.800 to +0.934) (41). The presence of multicollinearity of medium level in the data was indicated by a value of 32 from sample moment calculation (55), and there was no singularity ($r > .95$) on those items from the analysis result by AMOS.

EFA on 18 items was accepted because three measures met the criteria. Kaiser-Meyer-Olkin (KMO) measure sampling adequacy was 0.905, above the recommended benchmark of 0.6. Bartlett's test of sphericity was significant ($\chi^2 (153) = 2726, p < .001$). Thirdly, the diagonals of the anti-image correlation matrix for all items were between 0.799-0.944, above the standard of 0.5 (42).

Table 17 EFA results of RIPLS scale: Mean (SD), loading factor, and reliability (n=377)

Statement	Mean (SD)	Sub-scales / factor			
		1*	2*	3*	4*
1. Learning with other students / professionals will make me a more effective member of a health and social care team	1.88 (.59)	0.762	0.052	-0.025	-0.172
2. Patients would ultimately benefit if health and social care students / professionals work together	1.56 (.54)	0.567	-0.003	-0.073	0.124
3. Shared learning with other health and social care students / professionals will increase my ability to understand clinical problems	1.69 (.56)	0.656	0.058	0.012	0.093
4. Communications skills should be learned with other health and social care students / professionals	1.81 (.63)	0.403	0.031	0.130	0.288
5. Team-working skills are vital for all health and social care students / professionals to learn	1.68 (.54)	0.446	-0.010	-0.049	0.323
6. Shared learning will help me to understand my own professional limitations	1.85 (.59)	0.520	-0.006	-0.007	0.089
7. Learning between health and social care students before qualification and for professionals after qualification will improve working relationships after qualification / collaborative practice.	1.70 (.55)	0.058	0.033	0.027	0.729
8. Shared learning will help me think positively about other health and social care professionals	1.71 (.53)	0.200	0.103	0.025	0.602
9. For small-groups who are learning to work, students / professionals need to respect and trust each other	1.62 (.54)	0.201	-0.054	-0.082	0.496
10. I don't want to waste time learning with other health and social care students / professionals	2.53 (1.20)	-0.073	0.006	0.651	0.146
11. It is not necessary for undergraduate / postgraduate health and social care students / professionals to learn together	2.05 (.93)	0.043	-0.027	0.760	-0.088
12. Clinical problem solving can only be learnt effectively with students / professionals from my own school / organisation	2.47 (.99)	-0.112	0.052	0.727	0.064
13. Shared learning with other health and social care professionals will help me to communicate better with patients and other professionals	1.82 (.57)	0.270	0.401	0.007	0.073
14. I would welcome the opportunity to work on small group projects with other health and social care students / professionals	1.87 (.53)	0.152	0.546	0.020	-0.034
15. I would welcome the opportunity to share some generic lectures, tutorials or workshops with other health and social care students / professionals	1.87 (.54)	-0.011	0.945	-0.048	-0.123
16. Shared learning and practice will help me clarify the nature of patients' or clients' problems	1.83 (.53)	-0.060	0.668	0.008	0.227
18. I am not sure what my professional role will be / is	1.94 (.83)	0.200	-0.037	0.475	-0.327
19. I have to acquire much more knowledge and skill than other students / professionals in my own faculty/organisation	4.00 (.78)	-0.015	0.255	0.072	0.178
Cronbach's α		0.84	0.77	0.72	0.59
Total Variance Explained (59.9%)		37.3	10.8	6.1	5.7

EFA on RIPLS was performed by using maximum likelihood and promax rotation and we found the cross loading of some items on some factors. Further, we performed direct oblimin rotation and produced free of cross loading (Table 17). The EFA showed 59.9% of the total variance including 37.3% for the first factor (F1), 10.8% from the second factor (F2), 6.1% from the third factor (F3) and 5.7% from the fourth factor (F4). The composition of items for each sub-scale in the Indonesian version was unlike the previous studies. The results showed that F1 covered items 1-6, F2 did items 10-12 and 18, F3 did items 13-16 and 19, and F4 covered items 7-9. The factor loadings for item 19 was 0.255 whereas other sixteen items were more than 0.4 (between 0.401 - 0.905).

CFA Result: Measurement models of RIPLS

The CFA was conducted for the Indonesian version to examine reliability and validity of the scale and generated a fit model. Maximum likelihood method of estimation was chosen since normality assumption was not violated(41).

Initial model (Figure 9): The initial model was a measurement model derived from the results of EFA. The four-factor model with 18 items (F1: items 1-6; F2: item 7-9; F3: items 10-12, and 18; F4: items 13-16 and 19) evidenced that t-value of all items were significant by the criterion of $p < 0.05$. However, we found the Heywood case on item 19. The loading factors of items 1-16 were more than 0.5, but item 18 and 19 had loadings of 0.433 and -0.133, respectively, suggesting that items 18 and 19 were not represented in the measured constructs.

The initial model was not a fit model because items 18 and 19 had loading factors of less than 0.5 and there was a Heywood-case on item 19 (41, 42). Hence, we eliminated items 18 and 19 from the model and reconstructed 16 item model for the next analysis by using a previously existing theoretical models.

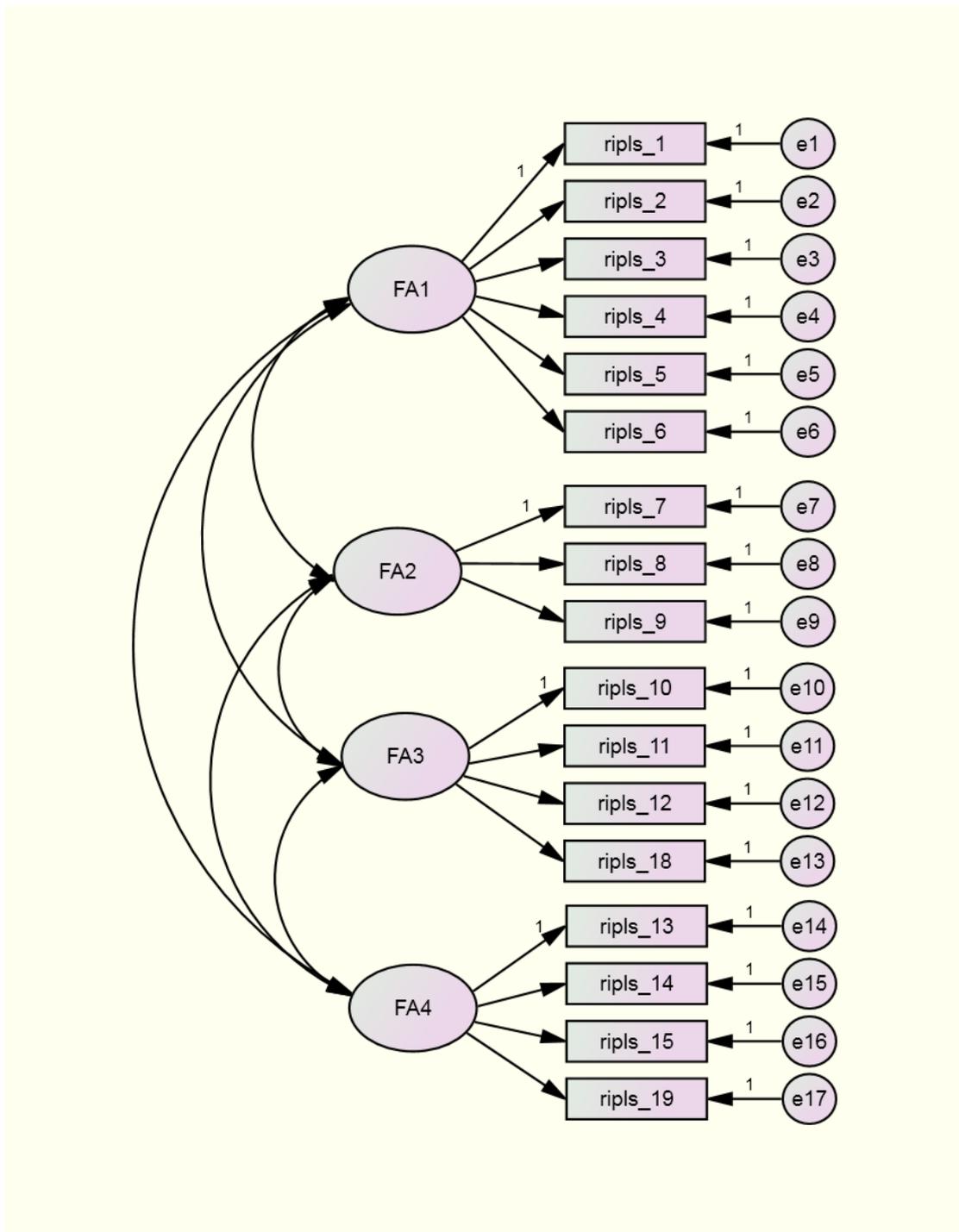


Figure 9 The measurement model of 18 items four-factor model (initial model)

Three-factor version (Figure 10): We conducted CFA on several models to find the fit model and the three-factor model with 16 items was satisfactory model for this study. The three-factor model with 16 items showed that factor loadings for all items ranged from 0.55 to 0.86. Although Hair (2005) suggested that the best factor loading was more than 0.7 (42),

however, factor loading more than 0.5 was also satisfactory, especially in the explorative research (56). Therefore, we retained all items (16 items) for model modification and further analysis. Furthermore, three-factor version with 16 items yielded significant value of the Normed chi-square=2.485, and all of goodness fit indices met criteria such as GFI (0.92), NFI (0.91), TLI (0.93), CFI (0.94), SRMR (0.043) and RMSEA (0.063), see Table 18.

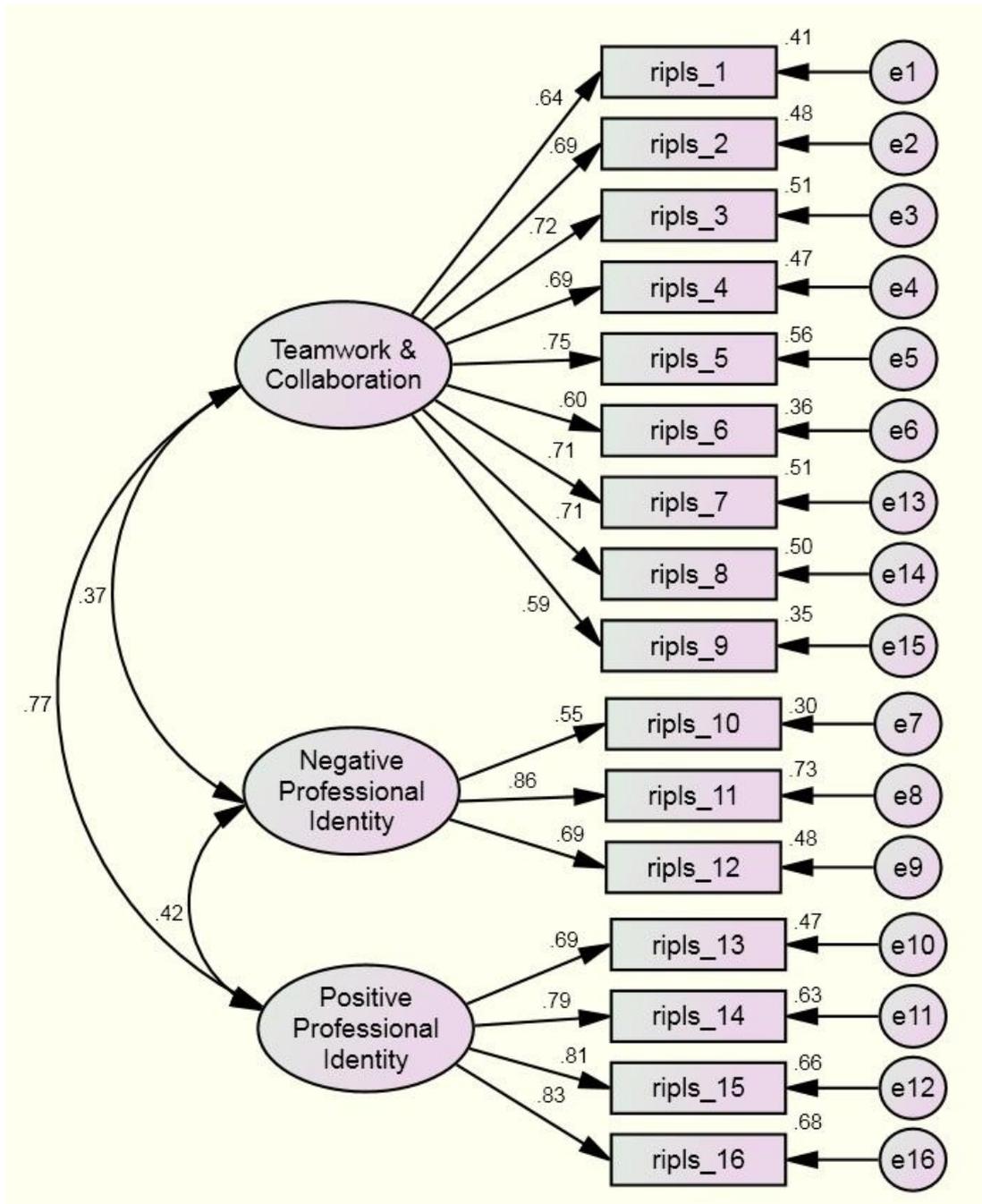


Figure 10 The measurement model of 18 items three-factor model (modified model)

Assessment of reliability and validity

Reliability analysis pointed out that the overall alpha coefficient of the initial model (0.69) was lower than modified models (0.87). Table 18 shows that three alpha coefficients of the modified model were more than 0.70.

Table 18 Validity and fit indices of initial and modified models of RIPLS (n=378)

Indicator	Reliability-Validity			Index Fit								AIC
	α	CR	AVE	CMIN (df)	CMIN /df	GFI	NFI	TLI	CFI	RMSEA	SRMR	
A. Initial Model (18 items)	(.69)											
FA1 (item 1 – 6)	.84	0.85	0.48	234.08	2.07	.93	.91	.94	.95	0.053	0.050	314.08
FA2 (item 7 – 9)	.77	0.77	0.43	(113)								
FA3 (item 10 – 12, 18)	.72	0.74	0.42									
FA4 (item 13 – 16, 19)	.59	0.68	0.45									
B. Modified Model (16 items)	(.87)											
<i>Three-factor</i>												
TWC (item 1-9)	.88	.89	.46	251.07	2.48	.92	.91	.93	.94	.063	0.043	321.67
NPI (item 10-12)	.73	.75	.51	(101)								
PPI (item 13-16)	.86	.86	.62									

Furthermore, average variance extracted (AVE) and composite reliability (CR) were calculated to check construct validity of the measurement model. CR values for each construct of the modified model were satisfied (>0.7)(65).AVE of each factor is expected to be > 0.5. AVE for two factors of NPI and PPI met the criterion and AVE for TWC factor was close to the criterion (see Table 18). Thus, the modified version had good construct validity.

Table 19 shows questionable discriminant validity for constructs of TWC since AVE of TWC (0.46) was lower than square correlation between TWC and PPI (0.59). Only construct of NPI and PPI indicated acceptable discriminant validity because the AVE was greater than the squared correlation. The results evidenced that NPI and PPI were unidimensional.

Table 19 Analyzing of discriminant validity on three-factor model of RIPLS scale (n=378)

Three factor model	TWC	NPI	PPI
TWC	0.46*		
NPI	0.14	0.51*	
PPI	0.59	0.18	0.62*

Notes: *Diagonal elements report of the AVE, and other matrix entries report the squared correlation estimation between them.

4.5 Discussion

4.5.1 Conflict in group (CIG) scale and atmosphere in group (AIG) scale

In this study, the original CIG scale and AIG scale were translated and adapted into the Indonesian settings. This study verified the Indonesian translation of the original version of group conflict and atmosphere in-group developed by Jehn and colleagues (43, 45) as a valid and reliable instrument to assess conflict in group and factors influence the group process. To our knowledge, this is the only scales that have been translated into the Indonesian version.

Through CFA processes, the initial model of EFA result was tested and did not offer the most desirable fit to our data. Reconstructing the measurement model was performed using the measurement model of the original study (16, 43, 45) and omitting item 8 of CIG scale due to low factor loading. To test the Goodness of Fit of three-factor model of CIG and AIG scales, we estimated several indexes. In CIG scale study, the χ^2/df ratio was 3.06, the GFI for model was 0.94, the CFI was 0.97 and TLI was 0.95, whereas the RMSEA was 0.083.

Likewise, AIG scale study, the χ^2/df ratio was 2.86, the GFI for model was 0.98, the CFI was 0.98 and TLI was 0.97, whereas the RMSEA was 0.078. These results indicate that the model had a very good fitness to our data.

In the current study, Cronbach's alpha was .92 for the total scale of both CIG and AIG scale. Cronbach's alpha was from 0.83 to 0.89 for subscales of CIG scale and from 0.83 to

0.89 for subscales of AIG scale. These figures are lower than those reported for the original scale(43, 45) which are an alpha of 0.73 to 0.94 for the subscales of AIG scale and 0.93 to 0.94 for the subscales of CIG scale. The item “there are differences of opinions in my team” of CIG scale was deleted from this study since factor loading of this item was 0.279, which means that only 2,8% of variation in this item is explained by CIG scale. Both AIG and CIG scales showed the discriminant validity were questionable since not all factors that constructed the scales were unidimensional (only RC and PC factor of CIG scale).

Nevertheless, we have the discriminant validity issues. Test of discriminant validity of IC scale yielded unidimensional constructs for RC and PC whereas the construct of TC was two-dimensional. While the discriminant validity test of GA scale demonstrated that all factors were two-dimensional. The results indicated that some observed variables correlated more highly with variables outside their factor than with the variables within their factor. This fact showed that a high alpha value does not necessarily indicate that a factor is unidimensional. The alpha coefficient is not sufficient for measuring the dimensionality of a construct or factor (89). This is evidenced by factor of TC, TR, RO and OD in which the alpha coefficients of those factors were high but those factors were multidimensional.

One prominent issue, which deserves attention, is that when translating an instrument to another language and testing its validity, the role of cultural differences must be considered. There are several factors that contributed to the emergence of discriminant validity problems and low factor loading. In this study, the existence of cultural diversity among respondents such as gender, ethnic, belief and local cultures (90) as well as students' experiences in working in group (91) may have influenced the responses to the items on Indonesian version. In addition, the health and education systems prevailing in Indonesia and the effect of translation into a particular language played a significant role in this study. The important

issue is that when translating an instrument to another language and testing its validity, the role of cultural differences must be considered (90).

4.5.2 RIPLS Scale

In this study, the original RIPLS was translated and adapted to Indonesian settings, and the Indonesian version was successfully proved the model with three constructs on 16 items by EFA and CFA and demonstrated as a reliable and valid scale.

EFA on the Indonesian version was run for 18 items by using direct oblimin and produced four-factor model. The total variance of this study was higher than that of the previous study (47, 92, 93). However, this study only used 18 items of 19 items from original study and the sample study was first to third year students. It was different from previous studies.

Through CFA processes, the four-factor model of EFA result was tested and did not offer the most desirable fit to our data, although the fit indices of this analysis was not disappointing (see Table 17). Reconstructing of measurement model by omitting item 18 and 19 due to low and negative loading factors, generated a three-factor model and can be labeled as TWC, PPI and NPI because these factors have the same formation with Fadyen's study (2005, 2006). Referring criterion of the fitted CFA model (94), we can conclude that the final CFA with this three-factor model showed satisfactory data for all the criteria of GOF indices. Absolute fit indices in this study consisted of Normed chi-square, RMSEA, GFI and the SRMR, and generated acceptable results (Normed chi-square= 2.24, GFI= 0.92, RMSEA= 0.063, SRMR= 0.043). Each absolute fit index was unique and cannot be used individually because the indices are sensitive to several factors such as the number of samples, whether the data is based on population or not, parsimony or complexities of a model, and number of parameters of a model (58, 95).

As for the comparative fit indices (94), also referred as incremental fit indices (63), we analyzed three indices i.e. indices of CFI, TLI and NFI, which those indices generate satisfactory data (CFI = 0.94, NFI = 0.91, TLI = 0.93). When NFI is very sensitive to sample size less than 200, then CFI is an index that not affected by sample size and also can be used as an indicator to ensure no misspecification models, whereas TLI is important index to compensate for the effect of the model complexity (94). Reconstructing of measurement model on Indonesian version is successfully because it yielded the lower AIC value on the new model (16 items three-factor model) when compared to the initial model (18 items four-factor model).

Internal consistency, as determined by alpha coefficient for each factor, was adequate in this study (alpha coefficient = 0.71 for the entire sample group; 0.75 to 0.88 for each factor). The results presented in Table 18 attested to the high internal consistency of the instrument in which all values were above the suggested 0.70 level for scale robustness (96).

Constructs validity of a three-factor model showed the AVE and CR of all constructs yielded the acceptable values but test of discriminant validity resulted unidimensional constructs for NPI and PPI whereas construct of TWC was two-dimensional. The factors that have a high alpha value do not necessarily indicate that those factors are unidimensional, because the factors that are multidimensional also have a high alpha coefficient. The alpha coefficient is not sufficient for measuring the dimensionality of a construct or factor (89). This is evidenced by TWC's factor in this study in which alpha coefficient of this factor was high but TWC's factor was multidimensional. Several factors are considered having contribution to the emergence of discriminant validity problem and the low factor loading. The existence of cultural diversity among respondents such as gender, ethnic, belief and local cultures (90) as well as students' experiences in multi-disciplinary working (93) have influenced respondents to give responses to the items on Indonesian version. Besides that, the

health and education systems prevailing in Indonesia and the effect of translation into a particular language played significant role in this study. The important issue is that when translating an instrument to another language and testing its validity, the role of cultural differences must be considered (90).

Several studies on validation of RIPL scale showed that the factor of roles and responsibilities is unstable. Parsell and Bligh's study (1998) only generated two factors (TWC and PI) and study on 1999 was produced three factors (TWC, PI, and RR) but the internal consistency of RR factor was unacceptable (<0.3). Similar results were also found in subsequent studies (McFadyen (2005) and Lauffs (2010)) and generated an inadequate internal consistency of RR factor, and another study failed to establish RR factor (97). Only study by McFadyen (2006) yielded an adequate internal coefficient of RR factor (RR=0.62). This condition related to the ability the respondents to comprehend the meaning of role and responsibilities in clinical setting (93). In this study, we failed to produced RR factor and it might be influenced by omitting the item 17, furthermore, it affected the item 18 and 19 to load in the same factor (RR factor).

In main study, the item 18 and 19 had low loadings and indicated that both items was not appropriate in Indonesian context. Item 18, "*I am not sure what my professional role will be / is*", had loadings of 0.436 by CFA. It is possible that the item wording introduced error variance. The participants in this study were first to third-year students. The first year students could answer this question by seeing this statement as contrarily with their understanding. Many studies of student's perception about career and the profession showed that the first-year students gave positive responses about how careers and their profession as a physician, nurses, and pharmacist (98-101). It showed that the students' views about the role of the profession were clear. The advance students' views towards their profession or other professions were acquired from the teachers, media, or prior work experiences. If students

encountered the unclear tasks and the overlapping of roles and responsibilities, then students would think that their professional role is not sure (14). In contrast, the understanding of the term "role and professional responsibility" in the clinical field may not be so obvious to young professionals as compared to the advanced students (93).

Item 19, "*I have to acquire much more knowledge and skill than other students/professionals in my own faculty/organisation*", had loadings of 0.255 on factor 2 by EFA and had loading of -0.133 by CFA. The wording of this question might have been a problem, because having confident in one's performance on "much more knowledge and skills" measure not only academic self-efficacy but also generalized self-esteem. In social learning theory, self-efficacy reflect in individual understanding of what knowledge and skills he/she can offer to the members in a group setting (102). However, item 19 implied not only high self-efficacy, but also contained the meaning of competition in Indonesian. The meaning of this statement is contrary to the concept of equanimity in Indonesian society. The concept of "equanimity" in Indonesian society is influenced by beliefs or religions and this concept meant to do everything for the good of human and nature and not for self-effacing. More than two-thirds of the participants in this study were from the countryside and they studied in Islamic boarding schools so that the understanding of this concept is deep-rooted.

4.6. Limitations

Although the reliability and validity of the RIPLS, CIG and AIG scales in Indonesian version are favorable, there are several limitations. Firstly, our sample was confined to a school of medical and health professionals in Indonesia that might not represent distribution of Indonesian students across all schools. The findings may be somewhat difficult to be generalized because the sample was only derived from an institution. Secondly, the sampling method was non-probability that may produce sampling bias. Nonetheless, the entirety of

sample represented students from various multicultural and social backgrounds, which may detract previously mentioned limitations. Thirdly, this psychometric study in Indonesian context resulted the questionable discriminant validity of adapted scale. Fourthly, especially for validation of RIPLS questionnaire, this study only validated 18 items of 19 items of RIPLS original scale among four courses (medicine, nursing, pharmacist, and public health) and an item of Indonesian version intragroup conflict scale exhibited misfit measurement within the model and was excluded. Consequently, further revision and assessment of the CIG and RIPLS psychometric properties in the Indonesian version are recommended.

4.7 Conclusions

Study 1 was conducted to validate the scale that would be used in the programme. The present study contributes to the literature in a couple of ways. Firstly, the translation and adaptation of intragroup scale (CIG), group atmosphere scale (AIG) and RIPLS into the Indonesian language by a cross-cultural adaptation process were successful and the Indonesian version produced a valid and reliable scale by structural equation modeling. In our knowledge, it is the first study addressed to investigate those scales in the Indonesian version. The psychometric properties were analyzed by both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). CFA resulted the measurement model with satisfactory reliability (alpha coefficients >0.7), construct validity and indices of goodness of fit (χ^2/df , GFI, TLI, CFI, SRMR, RMSEA). Secondly, further revisions for those scales are required since there are issues of discriminant validity.

Chapter 5

Study 2 - Evaluation of COMIC Programme: Results and Discussions

Chapter 5 provides an analysis of the research data from Study 2. The data analysis is presented in two sections. The sections are evaluation of the process of implementation of the COMIC programme and Kirkpatrick's evaluation model of COMIC programme.

Kirkpatrick's evaluation model included (1) Level 1: participant's reaction, (2) Level 2: attitudes, perceptions and knowledge, (3) Level 3: behavior in practical setting, and (4) Level 4: impact of the programme.

5.1 Evaluation of the implementation process of the educational programme

COMIC programme has successfully been implemented for 10 days effective in four months. Only 62 participants attended the whole programme. The proportion of female participants (n=47, 75.8%) was higher than male participants. Participants who participated in this study were from medicine (n=15), pharmacy (n=15), public health (n=16), and nursing (n=16) programmes. Likewise, tutor (n=20) from FMHS, SP's (n=20) and real patients (n=15) were actively involved. Due to the discrepancy between the COMIC programme schedule and the course schedule, 18 students (22.5%) were withdrawn from this programme. We rearranged several group members to make sure the composition of the group consisted of four disciplines. As a result, the number of groups was reduced and some groups had more than four members.

All modules and activities on the programme were carried out according to the programme'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 visits changed since the patient could not be visited and the groups should rearranged the meeting with the patient.

To evaluate the module quality of COMIC programme, the participants were requested to fill out the questionnaire of module quality and to rate various attribute of the workshop content and teaching method (1=poor to 10=very excellent). Table 20 illustrates the students’ reaction towards quality of each module and shows that the mean score of students’ responses for each learning method ranged from 7.53 (*lecture about social culture adaptation*) to 8.45 (*patient visit activities*). The students were more interested in and gave highest responses to the activities of “*patient visit*”, participated in the “*game of group dynamic*”, “*simulation of IPE practice*” and “*game of team building*”.

Table 20 Mean score of student’s responses of learning methods in COMIC Programme

Learning method	Student 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 role profession 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

5.2 Kirkpatrick’s evaluation model of the implementation of the COMIC programme

5.2.1 Level 1: Students’ satisfaction towards the IPL process

Students were asked to respond to six statements related to their satisfaction towards this programme and Table 21 shows students’ satisfaction towards the learning experiences in three periods of measurement (T3= after simulation, T4=after first patient visit, T5=after

third patient visit). All items of satisfaction scale are positive statement. The mean of students who gave responses to each item of satisfaction questionnaire was arranged between 5.24 (after 3rd patient`s visit) and 5.92 (after simulation session) and those results indicated that students were satisfied with the learning experience in this programme. Following this table, 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*“ were both rated very positively.

Table 21 Mean score of students` satisfaction scale in three periods of measurement

Items	T3	T4	T5
	Mean (SD)	Mean (SD)	Mean (SD)
1. I learned something that helped me in my present work.	5.92 (0.73)	5.40 (0.59)	5.73 (0.77)
2. The co-learning experience provided me with new ways of thinking about my work.	5.87 (0.71)	5.45 (0.64)	5.71 (0.76)
3. Co-learning was a valuable part of the overall curriculum.	5.71 (0.91)	5.31 (0.62)	5.53 (0.86)
4. I would recommend this experience for everyone in health care education.	5.82 (0.95)	5.24 (0.99)	5.56 (1.11)
5. My time is well spent.	5.81 (0.79)	5.34 (0.68)	5.52 (0.94)
6. I would recommend this experience to others in my programme.	5.63 (0.83)	5.40 (0.76)	5.50 (0.92)
Total Score	34.76 (3.96)	32.15 (3.45)	33.55 (4.44)

T3= after simulation, T4= after 1st patient visit, T5=after 3rd patient visit

Figure 11 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 ($F = -0.28$, $d.f. = 6$, $p = 0.945$). 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 ($\eta = 0.157$) and the effect size of discipline*time interaction ($\eta = 0.015$) were small effects (103).

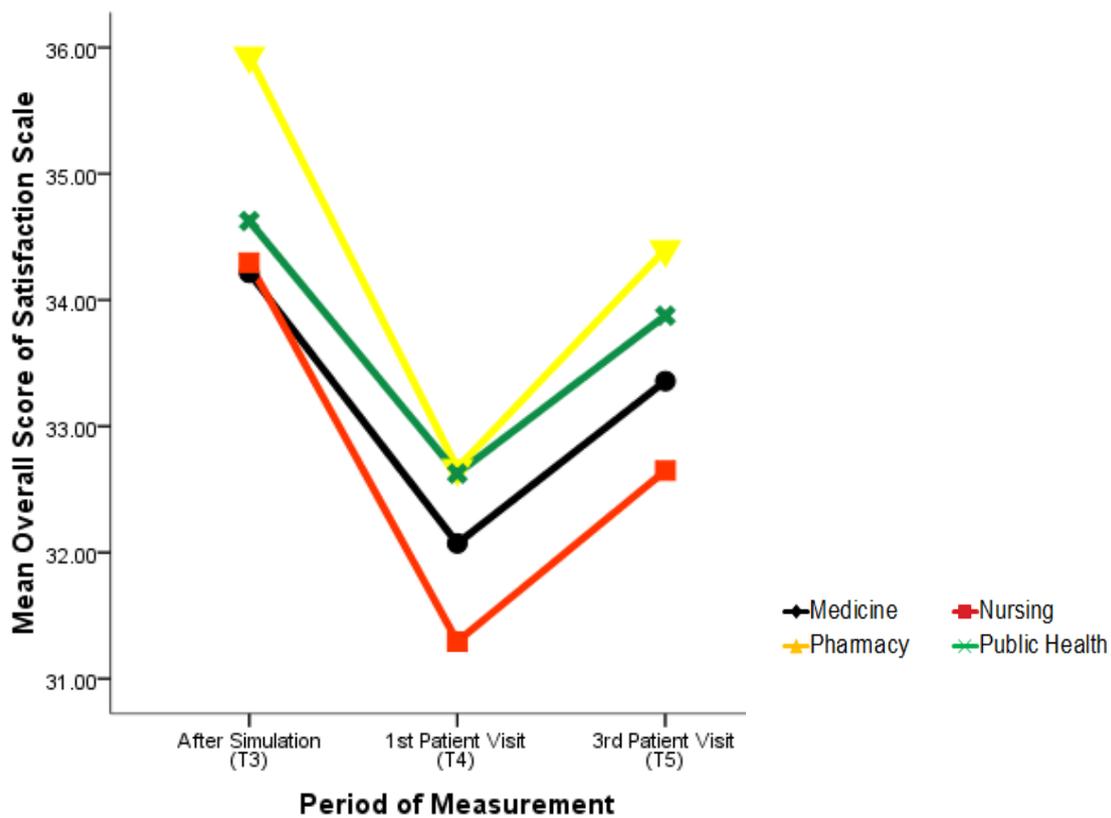


Figure 11 Mean overall score of satisfaction scale in three periods of measurement

5.2.2 Level 2: Progress in knowledge, attitudes and skills

Level 2A : Students' knowledge

Table 22 shows that the students' knowledge before intervention ($M = 15.68$, $SD = 2.52$) was lower than after intervention ($M = 16.65$, $SD = 2.88$). In order to test the improvement of students' knowledge of IPL, a paired-sample t-test was conducted. This test

was found to be statistically significant, $t(61) = -2.35$, $p < 0.022$. The Cohen effect's size was 0.36, indicating a moderate improvement significance in students' knowledge.

Table 22 Mean score of student's knowledge before and after delivering modules

Student`s				Paired Differences					
knowledge level	N	Mean	SD	Mean	SD	t-value	df	p	d
Before (T1)	62	15.68	2.52						
				-9.97	3.23	-2.35	61	0.022	0.36
After (T2)	62	16.65	2.88						

T1= start programme; T2= after first phase

Level 2B: Students' readiness for interprofessional learning

Student's readiness for IPL was assessed by using RIPLS scale in the Indonesian version. The Indonesian version consists of 16 items and is divided into three subscales including teamwork and collaboration (TWC, 9 items), negative professional identity (NPI, 3 items) and positive professional identity (PPI, 4 items). All items of TWC and PPI subscale are positive statements and items of NPI subscale is negative statement. For calculating the total mean score, we recoded items of NPI subscale into positive statement.

Table 23 shows students' perception towards readiness for IPL in three periods of measurement (T3= after simulation, T4=after first patient visit, T5=after third patient visit). On TWC subscale, the mean of students who gave responses to each item spread from 4.11 to 4.63 (responses from "agree" to "strongly agree"). Following this table, both of these statements, "*Learning with other students / professionals will make me a more effective member of a health and social care team*" and "*Patients would ultimately benefit if health and social care students / professionals worked together*", were positively rated by the respondents. On NPI subscale, the mean score of each item unfurl from 1.87 to 4.35 (responses from strongly disagree to strongly agree).

Table 23 Mean-SD of items of RIPLS scale in three periods of measurement

Items	Period of Measurement (Mean-SD)		
	T3*	T4*	T5*
Factor of TWC			
1. Learning with other students / professionals will make me a more effective member of a health and social care team	4.31 (0.62)	4.32 (0.47)	4.63 (0.49)
2. Patients would ultimately benefit if health and social care students / professionals worked together	4.50 (0.50)	4.35 (0.58)	4.40 (0.50)
3. Shared learning with other health and social care students / professionals will increase my ability to understand clinical problems	4.45 (0.53)	4.32 (0.50)	4.29 (0.56)
4. Communications skills should be learned with other health and social care students / professionals	4.37 (0.5)	4.34 (0.48)	4.29 (0.5)
5. Team-working skills are vital for all health and social care students / professionals to learn	4.45 (0.53)	4.35 (0.52)	4.26 (0.48)
6. Shared learning will help me to understand my own professional limitations	4.31 (0.50)	4.27 (0.58)	4.42 (0.53)
7. Learning between health and social care students before qualification and for professionals after qualification would improve working relationships after qualification / collaborative practice.	4.39 (0.52)	4.37 (0.52)	4.35 (0.48)
8. Shared learning will help me think positively about other health and social care professionals	4.35 (0.63)	4.29 (0.49)	4.11 (0.58)
9. For small-group learning to work, students / professionals need to respect and trust each other	4.44 (0.56)	4.35 (0.52)	2.56 (1.20)
Factor of NPI			
10. I don't want to waste time learning with other health and social care students / professionals	2.76 (1.29)	4.35 (0.52)	4.23 (0.49)
11. It is not necessary for undergraduate / postgraduate health and social care students / professionals to learn together	1.92 (0.80)	2.67 (1.18)	1.92 (0.87)
12. Clinical problem solving can only be learnt effectively with students / professionals from my own school / organisation	2.39 (0.96)	1.87 (0.71)	2.29 (1.01)
Factor of PPI			
13. Shared learning with other health and social care professionals will help me to communicate better with patients and other professionals	4.23 (0.56)	4.18 (0.50)	4.18 (0.39)
14. I would welcome the opportunity to work on small group projects with other health and social care students / professionals	4.21 (0.55)	4.29 (0.49)	4.26 (0.44)
15. I would welcome the opportunity to share some generic lectures, tutorials or workshops with other health and social care students / professionals	4.32 (0.47)	4.26 (0.51)	4.35 (0.48)
16. Shared learning and practice will help me clarify the nature of patients' or clients' problems	4.34 (0.48)	4.26 (0.44)	3.55 (0.99)
Total Score	67.59	62.68	63.29

T3= after simulation, T4= after 1st patient visit, T5=after 2nd patient visit

*= Mean (SD)

The statements of “*Clinical problem solving can only be learnt effectively with students / professionals from my own school / organisation*” (NPI subscale) was negatively

rated. Likewise, on PPI subscale, the mean of each item opens out from 3.55 from 4.34 (responses from “neutral” to “strongly agree”). The items “*I would welcome the opportunity to share some generic lectures, tutorials or workshops with other health and social care students / professionals*” and “*Shared learning and practice will help me clarify the nature of patients' or clients' problems*” were rated positively by respondents.

The pattern of students’ attitude towards IPL in three periods of measurement is described in Figure 12. Mean score of RIPLS was 67.59 after simulation (T3), 62.68 after patient visit (T4) and 63.29 after the third patient visit (T5). The mean score of RIPLS scale decreased significantly from T3 to T4 and increased slightly from T4 to T5.

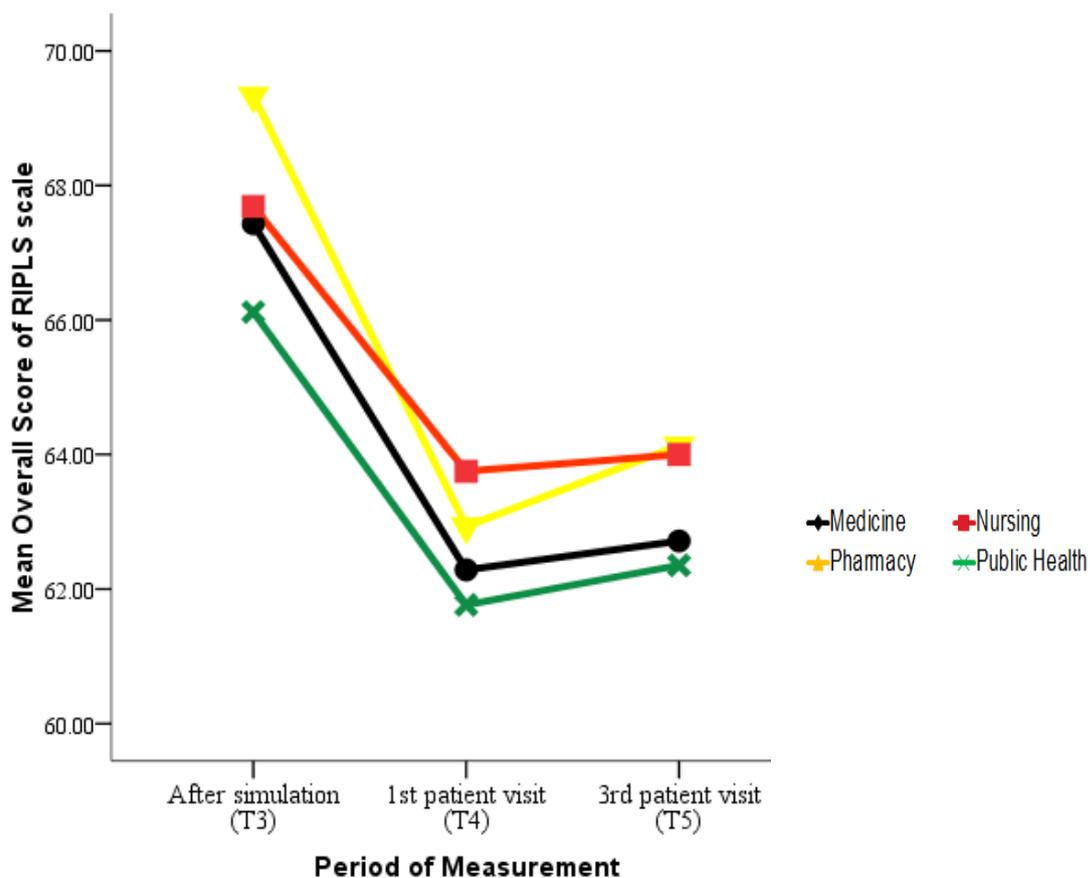


Figure 12 Overall score of RIPLS scale in three periods of measurement

Test of RM-ANOVAs of RIPLS scale and the three RIPLS sub-scales were summarized in Table 24. Mean score of RIPLS scale in three periods of measurement showed that the assumption of sphericity was violated by Mauchly's Test ($\chi^2(2) = 0.727, p < 0.0001$), therefore, a Greenhouse-Geisser correction was used. There was a significant difference in the mean score of RIPLS in three periods of measurement ($F = 20.21, d.f. = 1.571, p < 0.0001$) and the effect size was small ($\eta = 0.258$), indicating a small improvement in students' attitudes across time. However, the mean score of RIPLS associated with the interaction between disciplines and the period measurement showed no statistical significance ($F = 0.218, d.f. = 4.71, p = 0.948$). In addition, the difference of the mean RIPLS score between T3 and T4 as well as T3 and T5 were statistically significant different (both $p < 0.0001$), however there was no significant difference of the mean score between T4 and T5.

Table 24 Summary of RIPLS scale and RIPLS sub-scales of repeated measured ANOVA

Instrument	Period of Measurement (Mean-SD)			Probability of Time Interaction (p)			Time factor		Disciplines x Time	
	T3	T4	T5	T3 x T4	T3 x T5	T4 x T5	p	ES	p	ES
RIPLS scale	67.59 (6.09)	62.68 (4.84)	63.29 (3.82)	<0.0001	<0.0001	0.964	<0.0001	0.26	0.948	0.01
TWC	39.56 (3.53)	38.98 (3.43)	37.32 (2.91)	0.870	<0.0001	<0.0001	<0.0001	0.16	0.710	0.03
NPI	10.94 (2.39)	6.71 (2.11)	9.63 (1.69)	<0.0001	0.001	<0.0001	<0.0001	0.49	0.513	0.04
PPI	17.09 (1.66)	16.98 (1.61)	16.34 (1.58)	1.000	0.27	0.025	0.008	0.08	0.573	0.04

T3= after simulation, T4= after 1st patient visit, T5=after 2nd patient visit
TWC=Teamwork Collaboration; PPI=Positive Professional Identity; NPI=Negative Professional Identity
p=probabilities; ES=effect size

Similarly, the assumption of sphericity was not violated by Mauchly's Test for PPI subscale instead it was violated by Mauchly's Test for TWC and NPI subscales. Following Table 24, there were significant differences in the mean scores of TWC, NPI and PPI in three periods of measurement ($p < 0.005$) and the effect size was small to medium ($\eta = 0.16, 0.49$

and 0.08, respectively). The result indicated that there are medium improvement significance in students' attitudes of negative professional identity and a small improvement in students' attitudes towards teamwork-collaboration (TWC) and the positive professional identity (PPI) across time. However, the mean score of subscales associated with the interaction between disciplines and the period of measurement showed no significant difference for all subscales.

Table 25 Mean-SD of items of CIG scale in three periods of measurement

Items	Period of Measurement (Mean-SD)		
	T3	T4	T5
CIG Scale (10 items)	36.29 (7.85)	32.03 (6.89)	33.37 (8.22)
Factor of relationship conflict (RC)	14.02 (3.31)	12.15 (3.33)	12.68 (3.94)
1. There is a lot of friction among team members.	4.11 (1.12)	3.31 (1.08)	3.39 (1.19)
2. There are personality conflicts evident in my team.	3.44 (1.03)	2.90 (0.88)	3.16 (1.22)
3. There are tensions among members of my team.	3.52 (1.13)	3.03 (0.92)	3.03 (1.02)
4. There are emotional conflicts among members of my team.	2.95 (0.91)	2.90 (0.88)	3.10 (1.11)
Factor of task conflict (TC)	9.40 (2.35)	9.55 (2.38)	10.22 (2.61)
5. Members in my team disagree with opinions regarding the work being done.	3.08 (0.89)	2.98 (0.93)	3.23 (0.97)
6. There are conflicts about ideas in my team.	3.24 (0.95)	3.37 (1.00)	3.45 (1.04)
7. There is conflict about the work in my team.	3.08 (0.87)	3.19 (0.90)	3.55 (1.05)
Factor of process conflict (PC)	12.05 (3.45)	10.48 (2.58)	11.15 (3.21)
8. There are disagreements about who should do what in my team.	4.13 (1.24)	3.60 (1.06)	3.90 (1.20)
9. There is conflict about task responsibilities in my team.	3.94 (1.29)	3.32 (0.92)	3.48 (1.17)
10. There is disagreement about resource allocation in my team.	3.98 (1.18)	3.56 (1.05)	3.76 (1.22)

T3=after simulation activity; T4=after first patient visit; T5=after third patient visit

Level 2B: Students' attitude to deal with conflict in group

In this study, conflict in group was measured by three components including relationship conflict (RC), task conflict (TC) and process conflict (PC) by using CIG

Indonesian version. Table 25 shows the mean score of each item at three periods of measurement. CIG scales consisted of 10 items and the mean score of items of CIG scale ranged from 2.90 to 4.11 (responses from “strongly disagree” to “neutral”). The total mean score of CIG scale were 36.29 (T3), 32.03 (T4) and 33.37 (T5).

Figure 13 describes the pattern of three CIG sub-scales over time, varied by profession. The RC’s graph showed that RC reduced from T3 to T4 among all disciplines but RC increased greatly from T4 to T5 on public health group only, whereas medical group tended to decrease from T4 and T5. RC tended to be stable at T4 to T5 among nursing and pharmacy. Likewise, the TC pattern indicated that TC from T3 to T4 was stable among three disciplines, except public health, and TC tended to increase from T4 to T5 among all disciplines. Moreover, PC decreased significantly from T3 and T4 among three disciplines, except medical group. PC increased greatly from T4 to T5 only among public health students, but tended to be stable from T4 to T5 among three disciplines (medicine, nursing and pharmacy).

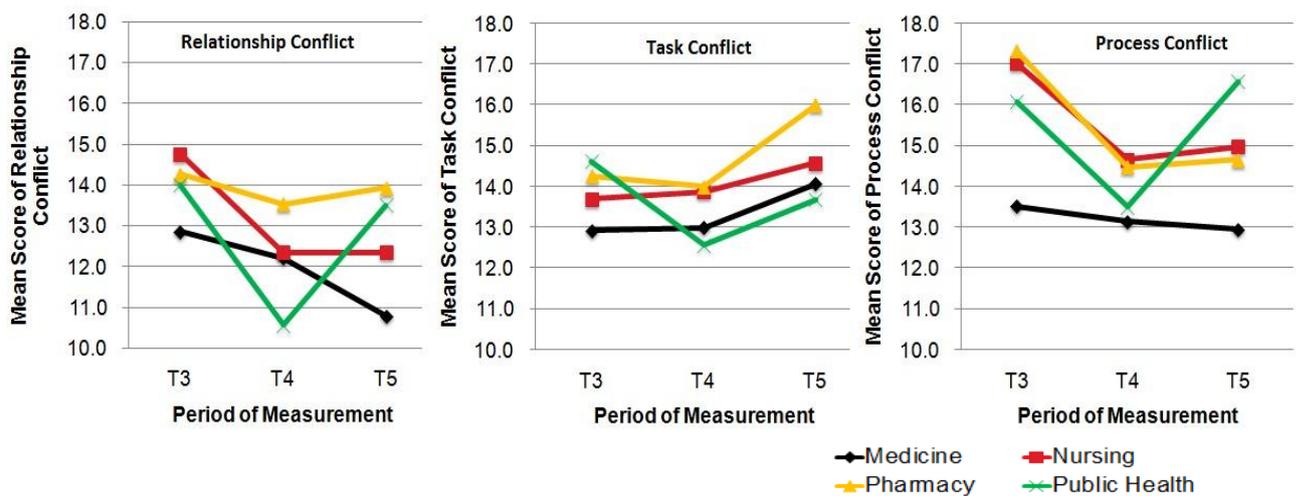


Figure 13 Patterns of three CIG sub-scales in three periods of measurement

Test of RM-ANOVAs of CIG scale and the three CIG sub-scales (RO, TC, and PC) were summarized in Table 26. Mean score of CIG scale over time showed that the assumption of sphericity was not violated by Mauchly's Test ($\chi^2(2) = 0.98, p=0.545$). There was statistically significant effects in CIG score for time ($p=0.006$) but there were no significant effects in CIG score for the discipline*time interaction ($F = 0.78, d.f. = 6, p=0.591$). The difference of mean score between T4 and T5 was statistically significant ($p=0.002$) but insignificant results were detected between T 3 and T4 ($p=0.776$) and T1 and T3 ($p=0.110$).

Similarly, the assumption of sphericity was not violated by Mauchly's Test for those three CIG sub-scales. There were statistical effects in RC sub-scale ($p=0.005$) and PC sub-scale ($p=0.011$) over time. The difference of mean scores between Time 1 and Time 2 was statistically significant on RC sub-scale ($p=0.006$) and PC sub-scale ($p=0.045$). The effect size on mean score of CIG scale and three CIG sub-scales due to time and discipline*time interaction was small ($d < 0.3$).

Table 26 Summary of CIG scales and CIG subscales of repeated measured ANOVA

Instrument	Probability of Time Interaction (p)			Time factor		Disciplines x Time	
	T3 x T4	T3 x T5	T4 x T5	p	ES	p	ES
CIG sub-scale	0.776	0.110	0.002	0.006	0.089	0.591	0.041
RC	0.005	0.098	1.000	0.006	0.088	0.273	0.065
TC	1.000	0.169	0.051	0.058	0.051	0.821	0.026
PC	0.011	0.533	0.437	0.045	0.057	0.584	0.040

p=probabilities; ES=effect size

Level 2B: Students' attitude towards atmosphere in group

The atmosphere in-group was measured by AIG Indonesian version. The atmosphere in group consisted of three components that included factors of trust (TR), respect for each

other (RO) and open discussion (OD). AIG scale consisted of eight items and Table 27 shows that the mean score of each item ranged from 5.10 to 5.60 (responses from “agree” to “strongly agree”). The total mean scores of AIG scale were 43.11 (T3), 41.81 (T4) and 42.79 (T5).

Table 27 Mean-SD of items of AIG scale in three periods of measurement

Items	Period of Measurement (Mean-SD)		
	T3	T4	T5
Total Score of AIGScale (8 items)	43.11(5.04)	41.81 (3.87)	42.79 (5.13)
Factor of trust (TR)	15.65 (1.93)	15.60 (1.45)	15.79 (2.12)
1. Members in my team trust each other.	5.26 (0.79)	5.24 (0.50)	5.23 (0.78)
2. Members in my team feel comfortable delegating to others in the team.	5.13 (0.82)	5.10 (0.62)	5.13 (0.76)
3. Team members are truthful and honest.	5.26 (0.72)	5.26 (0.51)	5.44 (0.84)
Factor of respect each other (RO)	11.13(1.56)	10.60 (1.06)	10.97(1.45)
4. Team members respect each other.	5.60 (0.80)	5.27 (0.55)	5.50 (0.76)
5. Team members respect each other’s ideas.	5.53 (0.86)	5.32 (0.54)	5.47 (0.74)
Factor of open discussion (OD)	16.34 (2.09)	15.61 (1.74)	16.03 (2.13)
6. In my team, we discuss issues openly.	5.52 (0.78)	5.31 (0.56)	5.37 (0.75)
7. In my team, we communicate openly.	5.50 (0.70)	5.26 (0.54)	5.44 (0.84)
8. In my team, conflicts are dealt with openly.	5.32 (0.86)	5.05 (0.86)	5.23 (0.73)

T3=after simulation activity; T4=after first patient visit; T5=after second patient visit

Figure 14 describes the pattern of three AIG sub-scales in three periods of measurement, varied by profession. Overall, graphs of TR, RO and OD, showed that mean score of medical group increased from T3 to T5 whereas other disciplines showed the graph that varied in each measurement for each subscale. Mean score of trust factor (TR) from T3 to T4 was stable but from T4 to T5 increased slightly only among medical group. The graph of RO factor showed that RO of three disciplines (nursing, pharmacy and public health)

decreased from T3 and T4 and the RO increased from T4 to T5. However, responses of students about OD (open discussion factor) varied among those disciplines. Mean of OD score among nursing and pharmacy group tended to decrease from T3 to T4 but among groups of medical and public health tended to stable.

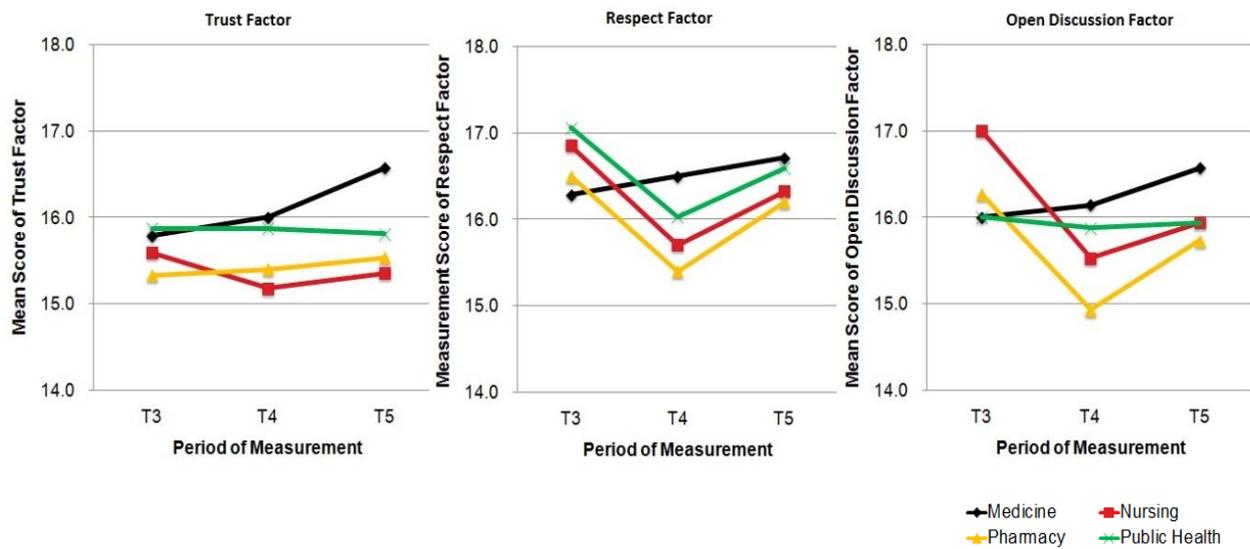


Figure 14 Patterns of three AIG sub-scales in three periods of measurement

Further, test of RM-ANOVAs of AIG scale and three AIG subscales were summarized in Table 28 and there were no violations to the assumption of sphericity. There were no statistically significant effects of mean scores for time and discipline*time interaction on AIG scale and three AIG sub-scales.

Table 28 Summary of AIG scales and AIG subscales of repeated measured ANOVA

Instrument	Probability of Time Interaction (p)			Time factor		Disciplines x Time	
	T3 x T4	T3 x T5	T4 x T5	p	ES	p	ES
AIG sub-scale	0.743	1.000	0.232	0.179	0.031	0.648	0.037
TR	1.000	0.832	0.923	0.443	0.015	0.938	0.016
RO	0.199	1.000	0.137	0.680	0.048	0.688	0.034
OD	0.387	1.000	0.230	0.130	0.036	0.312	0.061

p=probabilities; ES=effect size

Correlation between group atmosphere and group conflict

Table 29 shows the correlation between each subscale of AIG and CIG scale in three periods of measurement. There are significant correlations between each subscale of AIG scale in all measurements. On CIG scale, the significant correlations between each subscale were detected only on measurement at T3 and T4. However, the significant correlation was only discovered between RC and TC at T5.

Table 27 also described the cross correlation between subscales of AIG and CIG scales. At T4, there are significant correlations between subscales of AIG and CIG scale and insignificant correlation between RO and PC. Whereas only correlations between TRxTC and TRxPC at T3 and between TRxRC at T5 were significant.

Table 29 Correlation among AIG and CIG subscales in three period measurement

Subscale	TR	RO	OD	RC	TC	PC
After simulation (T3)						
1. TR	--	.758**	.651**	-0.122	-.314*	-.265*
2. RO		--	.775**	-0.064	-0.153	-0.102
3. OD			--	-0.093	-0.093	-0.077
4. RC				--	.621**	.505**
5. TC					--	.634**
6. PC						--
After 1 st patient visit (T4)						
1. TR	--	.784**	.683**	-.258*	-.394**	-.340**
2. RO		--	.774**	-.344**	-.381**	-0.184
3. OD			--	-.437**	-.411**	-.282*
4. RC				--	.597**	.511**
5. TC					--	.480**
6. PC						--
After 3 rd patient visit (T5)						
1. TR	--	.836**	.641**	-.291*	-0.106	-0.206
2. RO		--	.698**	-0.203	-0.02	-0.075
3. OD			--	-0.116	0.169	-0.167
4. RC				--	.653**	0.164
5. TC					--	0.149
6. PC						--

** p < 0.01 level; *p < 0.05 level.

“grey area” is correlation between CIG and AIG scales.

Level 2B: Students' perception about the roles of other professions

Table 30 shows students' perception about the roles of other professions that was measured by role profession scale (RPQ) (73). RPQ was translated into Indonesian language and we called it as modified RPQ. This scale consisted of nine positive statements and four negative statements. Following Table 30, the mean of overall score of students' perception towards role profession tended to decrease from the T3 to T4 but increased slightly from T4 to T5. The mean score of the positive statements of modified RPQ were arranged between 4.16 (after the 1st patient's visit) to 5.84 (after the 1st patient visit) and items "Have a medical focus" and "Have a social focus" were both rated positively. The mean score of negative statement of modified RPQ covered from 3.31 to 4.39 (both after the 1st patient visit). Following this table, item "Work more effectively alone" was rated negatively.

Table 30 Mean (SD) of items of role profession scale in three periods of measurement

Items	Period of Measurement (Mean-SD)*		
	T3	T4	T5
Have a medical focus	5.84 (0.79)	5.21 (0.52)	5.45 (0.67)
Have a social focus	5.68 (0.79)	5.23 (0.61)	5.32 (0.72)
Posses an objective medical perspective	5.63 (0.79)	5.19 (0.57)	5.34 (0.75)
Work effectively in a team	5.44 (1.08)	5.16 (0.63)	5.29 (0.73)
Have a high degree of professionalism	5.44 (1.05)	5.02 (0.78)	5.18 (0.88)
Are able to deal with a wide spectrum of patient types	5.03 (1.19)	4.84 (0.83)	4.66 (1.12)
Have good interpersonal skills in a group situation	5.26 (1.10)	5.02 (0.67)	5.06 (0.79)
Work autonomously	4.16 (1.38)	4.19 (1.01)	4.16 (1.15)
Have good interpersonal skills with an individual patient	5.05 (1.12)	4.85 (0.77)	4.45 (1.17)
<i>Act as superior to other professionals</i>	<i>4.39 (1.45)</i>	<i>4.16 (1.03)</i>	<i>3.97 (1.21)</i>
<i>Have a role that involves little collaboration</i>	<i>3.82 (1.47)</i>	<i>4.00 (1.09)</i>	<i>4.08 (1.05)</i>
<i>Work more effectively alone</i>	<i>3.31 (1.33)</i>	<i>3.65 (0.93)</i>	<i>3.40 (1.14)</i>
<i>Work as directed by another profession</i>	<i>3.56 (1.17)</i>	<i>4.16 (1.16)</i>	<i>3.77 (1.21)</i>
Total score**	64.44 (6.70)	60.74 (4.84)	61.69 (4.99)

T3=after simulation activity; T4=after first patient visit; T5=after third patient visit

* 7=very strongly agree 1=very strongly disagree

** Negative statement was recoded into positive statement

Figure 15 shows the graph of students' perception towards role perception in three periods of measurement. Overall, the mean score of RPQ scale for each discipline tended to decrease greatly from T3 to T4 and increase slightly from T4 and T5 among medicine and nursing students but tended to be stable among pharmacy and public health students. In addition, the mean score of modified RPQ scale of medical groups was higher than other disciplines. Test of RM-ANOVAs on the total score of the modified RPQ scale in three periods of measurement showed that the assumption of sphericity was violated by Mauchly's Test ($\chi^2(2) = 0.821, p=0.05$), therefore, a Greenhouse-Geisser correction was used. There was a significant difference in the mean score of RPQ in three periods of measurement ($F=10.485, d.f. = 1.696, p<0.0001$) and the effect size was small ($\eta = 0.16$), indicating a small improvement significance in students' perception towards role profession across time.

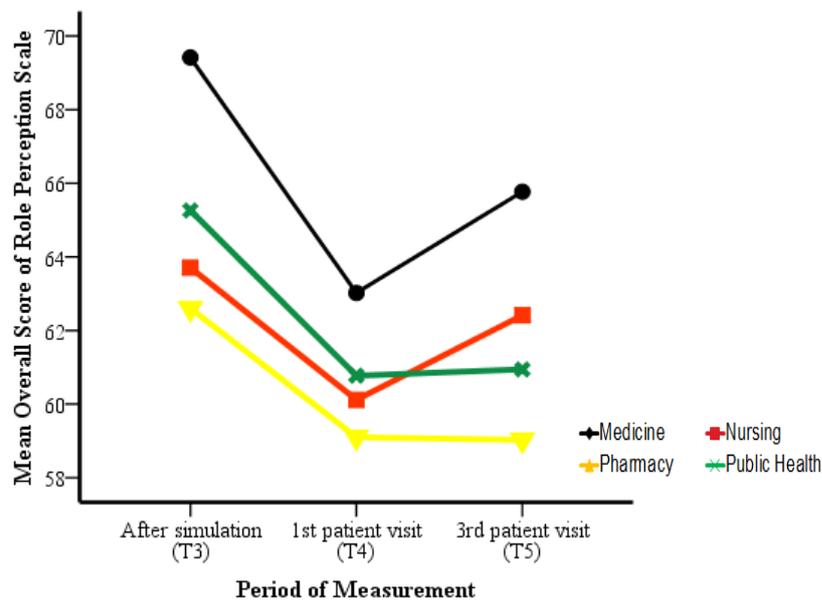


Figure 15 Overall score of role profession scale in three periods of measurement

However, the mean score of modified RPQ associated with the interaction between disciplines and the period measurement showed no statistical significance ($F= 0.660$, $df.=5.089$, $p=0.66$). The difference of mean score of modified RPQ between T3 and T4 ($p<0.0001$) as well as T3 and T5 ($p=0.019$) was statistically significant, however there was no significant difference of the mean score between T4 and T5 ($p=0.559$).

5.2.3 Level 3: Students' behavior towards practice in real setting

In this level, in figuring out to what extend students' knowledge, attitude and skills were applied into practice setting, tutors assessed students' behavior on team performance, communication skills, and teamwork skill (Table 31) during simulation session and the first patient visit. We did not assess student's skills before the programme was running. In this evaluation, rating of evaluation for each item ranged from 1 (lowest) to 10 (perfect).

Evaluation of team performance consisted of seven items and the item score ranged from 6.91 (during simulation session) to 7.61 (during 1st patient visit). Item "*Communication between team members*" was the highest on team performance at both simulation model and the 1st patient visit. Evaluation of communication skills was composed of six items and tutor score of item of communication skills scoped from 6.95 (simulation model) to 7.81 (1st patient visit). The highest score was item "*Listen attentively*" at both simulation model and the 1st patient visit. Evaluation of teamwork skills that contained four items produced the highest score for item "*Is courteous to team members*".

In two observations, all mean score of the students' skills after the 1st patient visit was higher than before the 1st patient visit (during simulation session), and t-test analysis showed that there is significant difference the mean score for each skills between before and after the 1st patient visit ($p<0.0001$). The effect size of all skills was 0.95, 0.98, and 0.75 for team performance, communication skills, and teamwork skill respectively and was a large effect

size following standard by Cohen's benchmark(103). The results showed that the students' skills after the first patient visit were outperformed for more than 80% of the student's skills before patient visit. All items of group performance indicator showed significant difference between before and after the first patient visit, except item "freedom from errors". This item needs to be revised.

Table 31 Mean score and t-test of group performance by team tutors

Indicator	Simulation model (N=193)		1 st patient visit (N=148)		t- value	df	p	d
	Mean	(SD)	Mean	(SD)				
<i>Team performance (TP)</i>	49.98	(5.47)	51.98	(3.47)	-4.11	328.37	<0.0001	0.95
Speed	7.24	0.96	7.57	0.67	-3.78	335.64	<0.0001	
Quality of team work	7.11	0.94	7.51	0.57	-4.83	322.70	<0.0001	
Fluidity of team work	7.13	0.87	7.44	0.62	-3.82	337.30	<0.0001	
Freedom of errors	6.91	0.93	7.04	0.72	-1.48	338.99	0.14	
Communication between team members	7.25	0.93	7.61	0.54	-4.47	317.42	<0.0001	
Decision-making	7.13	0.93	7.37	0.64	-2.84	335.58	0.01	
Overall performance	7.20	0.84	7.44	0.65	-2.91	339.00	<0.0001	
<i>Communication skills (CS)</i>	43.49	(4.02)	45.23	(2.23)	-5.08	311.46	<0.0001	0.98
Communicate effectively with team members	7.24	0.87	7.46	0.58	-2.86	332.56	0.01	
Does use commonly known technical terms	7.15	0.81	7.36	0.55	-2.98	334.12	<0.0001	
Explains unknown terms	6.95	0.93	7.26	0.56	-3.81	322.95	<0.0001	
Listen attentively	7.48	0.70	7.81	0.44	-5.24	326.30	<0.0001	
Uses easily understood questions	7.41	0.71	7.68	0.49	-3.99	335.90	<0.0001	
Uses easily understood comments	7.27	0.71	7.67	0.48	-6.18	334.72	<0.0001	
<i>Teamwork skills (TS)</i>	30.23	(2.63)	31.32	(1.65)	-4.72	326.72	<0.0001	0.75
Is courteous to team members	7.80	0.66	8.03	0.66	-3.25	316.61	<0.0001	
Respect to the professional knowledge and skills of team members	7.65	0.66	7.85	0.42	-3.58	329.74	<0.0001	
Accepts responsibility for professional actions	7.37	0.86	7.71	0.51	-4.54	319.86	<0.0001	
Collaborates well with team members	7.41	0.86	7.73	0.54	-4.17	327.09	<0.0001	

5.2.4 Level 4: Impact of COMIC programme

Level 4A: Impact of the COMIC programme for organization (structure, resources)

Tutor written comments

Twenty tutors who were engaged in COMIC programme reflected their experiences into internal and external factors of implementation of IPE programme at FMHS (Table 32) and used the evaluation results to construct some recommendations. The tutors written comments revealed that nobody doubted the positive impact and benefit of the implementation of IPE for patients, community, and health professionals. All participants stated that IPE was an initiative model that was appropriate for the current conditions in Indonesia because of the increasing public demand for better health care and improvement of cooperation among the profession for effective and efficient health services. IPE is expected to improve the health services that are currently fragmented, eliminate the hierarchy among the profession that worsen the relations between profession, as well as motivate students or professionals from any disciplines to delve deeper about their profession and other professions.

However, participants realized that there would be differences in the application of IPE in the hospital and in the faculty because of the differences in the conditions and current problems that will affect the implementation of this concept. Some participants stated some issues that were considered as barriers for implementation in the future, particularly in hospitals, such as (a) the fragmentation of medical specialist services in secondary level services; (b) the hierarchy problem among healthcare professionals in hospitals; and (c) overlapping of duties and responsibilities that trigger disharmony of the relationships among professions (Table 32).

Table 32 Evaluation of internal and external factors by tutors

INTERNAL FACTORS	
Strengths	Weaknesses
<ul style="list-style-type: none"> • All disciplines studied in the same building • Matriculation module was provided for the first year students of all disciplines. • University's vision and mission are consistent with the IPE concept. The vision/mission is that each graduate is capable of integrating scientific IPE (basic sciences, social sciences and Islamic sciences) in practice. • Medical curriculum is competency based implementing problem based learning (PBL). 	<ul style="list-style-type: none"> • The learning method is uniprofessional for all disciplines. • Pharmacy, public health and nursing programmes apply subject based curriculum by implementing teaching in the classroom (lecture based) • Time constraint due to the tight schedule among disciplines • The experts related in IP learning are limited • The skilled lecturers were few. • The funding for providing a new model is limited. • There are professional conflicts among discipline especially in hospitals. • The negative perception among disciplines • Some medical specialists reject the IPE concept because of the existence of overlapping of duties and responsibilities among the professions.
EXTERNAL FACTORS	
Opportunities	Threats
<ul style="list-style-type: none"> • IPE development in educational institution or health services is government-sponsored from Ministry of National Education IPE and Ministry of Health, Indonesia. • Demand from patient and community for the best quality of, comprehensive, and integrated health services. • Implementation of IPE at UIN will be an initiative model in Indonesia. 	<ul style="list-style-type: none"> • Professions and specialists in hospitals were fragmented. • The hierarchy issues existed among nursing, physician, pharmacist and public health programmes. • Faculty staff members were apprehensive that this programme would add the number of subjects in the curriculum.

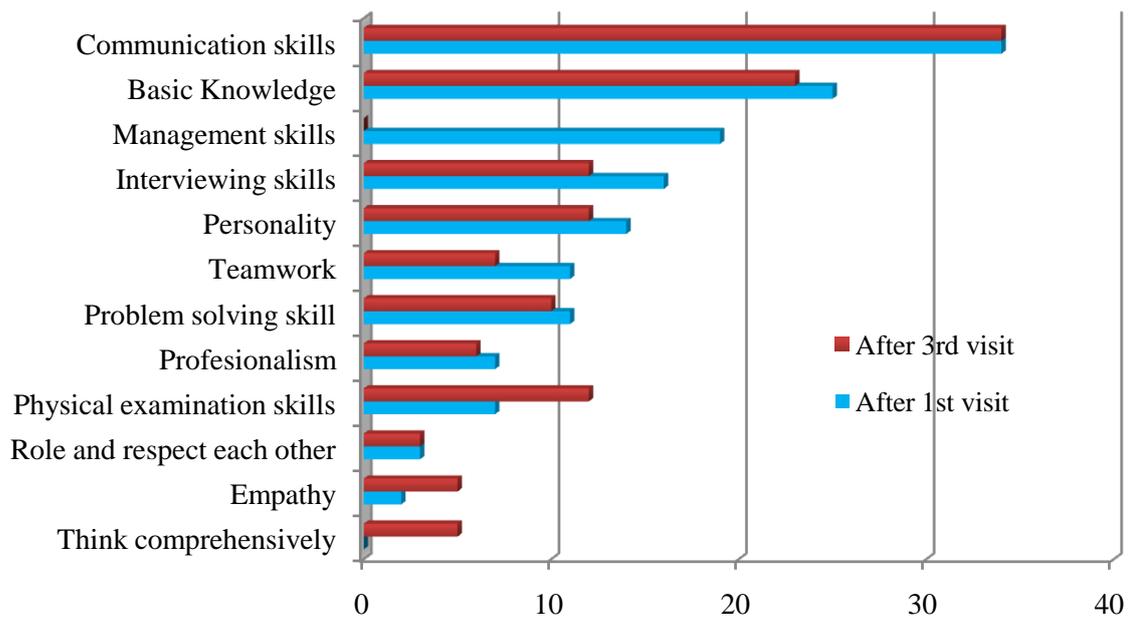
The recommendations are, firstly, that the introduction of IPE learning is initiated since the beginning to develop practitioners who have comprehensive understanding of the IPE and that this should be started by integrating aspects of the IPE concept in the

matriculation module for the first year students. Secondly, an internal approach should be employed by involving the faculty and university structure to eliminate the boundaries in and between departments/disciplines. Thirdly, an external approach should be performed with the socialization of IPE to the agencies that collaborated with the faculty such as hospitals, health centers, and other health care institutions.

Students' written comments

Students gave their written opinions about the competencies required for performing home care, as well as benefit and barriers during involvement in this learning. As to COMIC programme, 59 students (95.16%) agreed to integrate this programme into the curriculum because the students gained benefit during their involvement in this programme such as new knowledge and skills, learn to solve the patient's problem integrated and comprehensively, and understand deeply their own profession and other professions.

Figure 16 shows students' written responses towards the required competencies in real setting and summarized that communication skills, basic knowledge, problem solving skills and the attitude of professionalism were the competencies required in both first and third patient visits. Specific competencies were required on different phases such as competency of "the management skills" existed only in the first visit while competency of "think comprehensively" was necessary on the third visit. While how to deal with strange individual traits (arrogant, bossy), how to work in team and interviewing skills are important competencies that were needed in the first visit but those skills were not prioritized on the third visit. The evidences suggested that students required some specific competencies when applying the concept of IPE learning at a particular phase.



Note: the total number of perceived competency is greater than 62 due to multiple responses provided by some students

Figure 16 Students' opinions about the required competencies in community setting

Nevertheless, students also dealt with barriers such as conflict to adjust schedule for meeting with group members (main barrier) during this programme, whereas communication between profession, relationship with other professions, and how to manage team were considered as hurdles in this programme. In the beginning of the programme, students confronted with traits of arrogance and bossiness, difficulty to communicate with other professions, and the tight programme schedule. The factors that caused conflict in the group are summarized in Figure 17. They commented on conflict such as *“it was difficult to set up the schedule for discussions with group members ... the crowded course schedules among disciplines.”* They commented on the overlapping among disciplines such as *“only for the first time when we come together, I felt the overlapping of knowledge among disciplines, but after being involved in teamwork during this activity, we became accustomed”*. In their written comments about the relationship with other members, the participants described their

difficulties with attitude towards and communication with other professions. The participants wrote that “... *hesitant how to behave in a team and communicate with other group members.*”

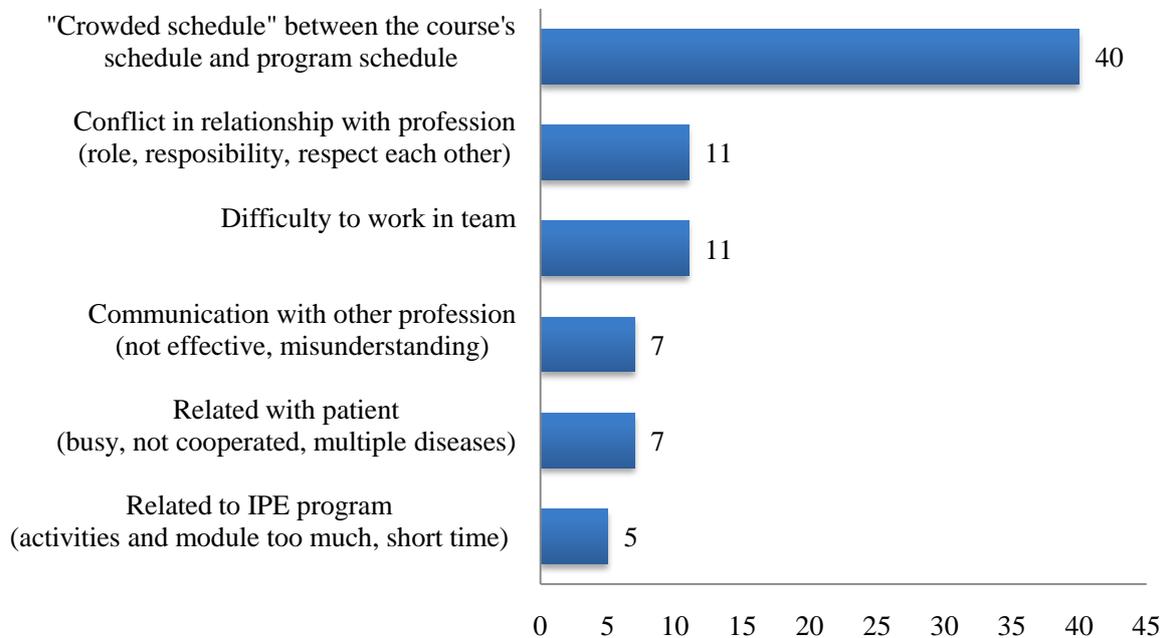


Figure 17 Student’s responses about barriers in COMIC programme

5.3 Discussion

5.3.1 Preparation phase

At this phase, there are the four stages of preparations that need considerable attention including (1) the training of tutors, (2) the training of SPs, (3) the development of trigger or case and (4) the selection of real patient. Since the application of the learning curriculum in FMHS varied, this programme performed a screening test to determine the understanding of some pedagogical theory and methods of learning among the teaching staffs before implementation of tutor’s training. IPE learning applies the theory concept of constructivism (adult learning, experiential learning, situated learning, etc.). The medical programme has been using problem based learning (PBL) for 6 years therefore all teaching staffs have been

trained as tutors/facilitators, coaches, or mentors. However, most of the teaching staff members from other disciplines have never been trained as tutors or involved in training or learning PBL because the disciplines of nursing, pharmacy and public health implement the traditional curriculum such as lecture based and teacher centered.

The tutor training that was held for two days for this programme was insufficient, therefore some tutors had the initiative to discuss and practice with tutors from medical staffs who are experienced with this method outside training hours. This initiative showed the desire of tutors to learn about IPE more deeply. The participants considered that the tutor's role on this learning model was unique because (a) the tutor's role are multi function, not as facilitator only, (b) they learned how to work in groups and discuss with different disciplines either with students or other tutors, (c) they learned how to assess students in this learning programme. A total of 30 tutors committed to engage in the IPL, but only 22 tutors attended the workshop, and during the programme implementation, only 20 tutors participated fully in this programme.

On the training of SPs, the enthusiasm of participants to join the programme is considerably high, because this activity is considered as something new and challenging for them. Medical programme has been regularly conducting SPs training for examination of OSCE (objective structure clinical evaluation) and training of basic clinical skills, but most of SPs participants were the faculty staff members or the administrative staff members. Public involvement in the SPs training is a new experience for the FMHS. The requirements for SPs recruitment are people who were living near the FMHS, various professional backgrounds, and having educational background of at least junior high school or its equivalent. Recruitment of SPs is not too difficult because of the great public enthusiasm. In this training, as many as 35 people registered as SPs and we only trained 20 participants due to the limitation of funding. We provided transportation facility and lunch meal for SPs

during the activity. In the beginning of the training, some SPs seemed to be nervous to communicate with other people, felt the fear of being wrong, and the difficulty in acting (such as how to express pain or specific complaints). This situation was overcome by doing exercises using the scenarios based on their own experience and further they practiced with other SPs.

The selection of the cases (disease or health problem) for development the scenario that used in IPL by tutors and researcher was a unique process and generated a debate and long argument. Because this study involved various disciplines, there were some criteria that set to the determination of this case including (a) the student's ability level; (b) the curriculum content that has been delivered to the student; (c) the selected case which required the integrated and comprehensive solution that can be analyzed from various disciplines standpoints; and (d) the selected case described the main problem in the community because the implementation of IPL activity was in community-based.

In Indonesia, the health center (which we call as Puskesmas) is an important primary health care in the community. In this activity, the determination of the location of research and real patients was determined by the local health center. Researchers, faculty staff members and staff members of health center visited the study site to evaluate the accessibility of students and tutors when visiting the field. In addition, this visit was also important to ask for permission to the patient for this learning activity. Some patients were unable to decide for themselves whether the visitations to their houses were allowed because some patients are sometimes still living with their extended family so they had to ask permission from the other family members.

5.3.2 The Kirkpatrick's evaluation model

Kirkpatrick's level 1 – Students' satisfaction of the IPL process

The level of students' satisfaction in attending this programme was quite satisfactory and it showed that the programme provided benefit and a valuable experience during their study and for their careers in the future. In this programme, the mean score of student satisfaction reduced at after first patient visit (T3) compared the mean score at after simulation (T4) and after third patient visit (T5). This condition indicated that the first patient visit was a critical point of IPE learning in COMIC programme since the first patient visit was the first experience for students both to encounter and apply their knowledge directly on real patients. In addition, the reduction of student satisfaction in this programme was influenced by, first, the complexity of patient problems that included medical and psycho-social problems. The fact is difficult for groups to devise a solution since this activity was the first experience of interacting with a real patient. Second, the arrangement of meetings was problematic for each group because of the crowded course schedule. Third, the difficulties that were encountered each group to make appointments with patients at weekends, as the patient was only available on weekdays, whereas students had a busy schedule on weekdays.

These conditions raised group conflict and students were dissatisfied during this period; however, the conditions resulted in positive reactions indicated by an increasing the mean score at after third patient visit. The ability of each group to undergo this phase well was supported by the significant positive changes in student behavior (see Table 31) and finally generated a positive impact for the next phases. This evidence indicated that the intervention with various teaching methods and activities (22, 25) in the COMIC programme given before practice in real setting was effective in preparing students and groups for collaborative practice in real settings.

Kirkpatrick`s level 2 – Progress in knowledge and attitude

Student perception toward readiness for IPL

Student reaction as indicated by the positive significance of student satisfaction supported the result of student readiness for IPL, which the mean score of RIPLS scale increased during the programme period. This study showed that students' readiness for IPL was changed positively during the programme period and statistically significant. The readiness for IPL was influenced by three factors that including share learning for teamwork and collaboration (TWC), positive professional identity (PPI) and negative professional identity (NPI). In COMIC programme, the mean score of TWC and PPI tended to decrease during the programme period (Table 24) however the students' view about negative professional identity (NPI) tended to increase significantly from T4 to T5. This result showed that there were some factors that influenced students' viewpoint toward other disciplines such as conflict in group, unclear task and responsibility or students' negative traits.

However, overall, students' attitudes toward teamwork and collaboration as well as student's professional identity yielded significant positive change. The programme proved to be effective in building students' understanding of the concept of shared learning (90).

Student perception toward role other professions

The students' views towards other professions were acquired from the teachers, media, or prior work experiences. Students' attitudes about other providers were not fixed; there was significant variation in expressed attitudes during the educational programme period ranging from very positive in the beginning and decreased after the first patient visit and increased again after the third patient visit. If students encountered unclear tasks and the overlapping of roles and responsibilities, then students would think that their professional role was not clear (14). Students' written comment revealed that limited understanding of the roles,

responsibilities, and task of professions from other disciplines are the factors that inhibit the understanding towards role other profession. Also, the understanding of the term "role and professional responsibility" in the clinical field may not be so obvious to young professionals as compared to the advanced students (93). However, after involve in this programme, the student's perception towards role profession changed significant.

Student attitude to overcome intra group conflict and maintain atmosphere in group

This study found the unique result of the correlation between the factors of AIG and CIG scales. At the first patient visit, a significant correlation between the factors of AIG with CIG was observed as an uniqueness if compared at during simulation activity and after third patient visit. The significant correlation between factors of CIG and AIG showed that there was major interaction in group process which influenced group performance and the development of conflict in group during 1st patient visit than simulation phase and 3rd patient visit. This phenomenon was supported by two results namely 1) decreased mean score of AIG scale and increased the mean score of CIG scale and 2) significant correlation between all factors of AIG and CIG scales. The burden of student activities at the first patient visit were high due to it being the first experience dealing with real patients as well as the fact that practice in real settings was more complex than they had learned in the simulation session.

All those conditions affected the group process but contrarily, the tutors' evaluation reported a significant improvement in group performance during the first patient visit (see Table 31). The improvement of group performance had helped each group to undergo this situation smoothly, and students could adapt well in the next process, which it was shown the result at T3 (see Figure 13 and 14). Based on the above results, the next studies need to consider the selection of cases for interprofessional practice in a real setting if the sample characteristic is similar. In this study, the selection of patients with chronic disease, and the

student's first experience of dealing with real patients are the main factors that affected interprofessional teamwork in this programme.

Similarly, the mean score of CIG subscales of public health students was higher after simulation at the 3rd patient visit than the 1st patient visit. In this programme, during the phase of simulation activity and the 3rd patient visit, each group conducted group discussions to manage patients' problems. In this situation, public health students proposed disease prevention and health promotion as their main strategies to solve patients' problems whereas other disciplines focused more on curative patient treatment. The existence of these differences lead to conflicts within the team and ultimately influenced the development of groups and lead to other conflicts. Differences in educational background are the trigger leading to professional conflict (14).

Likewise, the mean score of relationship conflict (RC) of nursing group decreased greatly from T3 to T4 and increased sharply from T4 to T5. The relationship conflict (RC) involved personal issues such as dislike among groups members and feeling such as annoyance, frustration, and irritation. In this study, period between after first visit and third visit was difficult period in term of interaction among members. There was a possibility that nursing group deal with personal issues such as annoyance and frustration. Moreover, nursing students face the "unexpected" attitude or behaviors exhibited by members of the group such as arrogance, bossy and not accept the opinion from other members.

Finally, the development of conflict in-group and group processes varied among professions and we analyzed the several factors that affected the interprofessional health team in this programme.

Firstly, the differences in educational background and the teaching method

Both medical and public health students showed a uniqueness of graph pattern (see Figure 13 and 14). The patterns of conflict in-group and atmosphere in group among medical

students showed the differences of pattern with other disciplines, where the mean score of CIG subscales tended to decrease, except the pattern of task conflict (TC); and AIG subscales increased gradually across time. It indicated that medical students accustomed to working in teams and this was due to the medical programme having implemented the problem based learning (PBL) approach since the first year, while other disciplines applied lecture-based learning in large classrooms. This evidence supported previous studies that the ability to cooperate was formed through a continual process (104) and PBL had developed students' ability to resolve conflicts within their teams, developing a good group process, and were better in adapting different professional behavior in an interprofessional team(105).

Secondly, workload in-group

In this study, task conflict had a tendency to increase over time and this result was relevant to the previous research (43, 106). Increasing the task conflict and process conflict was associated with the group task to manage patients. The managing of a patient with chronic disease in a primary care service needs a holistic management care approach (21, 107) that focuses on curative, prevention and bio-psycho social approach. It required the management skills. This situation added to the workload in a group and exacerbated by the fact that addressing real patient was the was the first experience for students. The group, however, needed experiences and the complex skills to handle several group tasks at once and to manage the complex problem. These circumstances sparked the task conflict in the teams (91, 108).

Thirdly, overlapping of knowledge and competencies among professions

Overlapping of knowledge and competencies played a role in the emergence of process conflict (14). When conducting group discussion and patient visits, the participants

dealt with the overlapping of some competencies. In interprofessional health teams, overlapping of competencies will be linked to the responsibility and authority to manage patients (14). If the lines of professional responsibilities were blurred then this circumstance will lead to conflict (14). Nevertheless, the participants stated that they were able to handle this situation by constantly interacting in teamwork with other group members so that each group member comprehended and was capable to overcome this problem. Those results reflected that conflict related to overlapping tasks and responsibilities were the sensitive conflict in health teams, and understanding why the development of teamwork in medical and health groups seems less developed than non-health field (8).

Fourthly, inability to communicate with other professional

Inability to communicate with other professional students was also a trigger of process conflict in groups (109). Although the simulation activities trained all participants on how to communicate with group members, apparently they were not sufficient to form the ability to put this into practice with real patients. It is not surprising because the communication module that was mainly taught to students over the years were communication to patients and communication within their own professions. Communication with people from different professions in either simulation or real settings was rarely taught to students (14).

This study provided valuable evidence of the development of conflict in-group in the IPL process and showed how norms and social process influenced group development. However, for implementation of the programme into practice, it is necessary to consider some local issues and situations. We propose that the faculty encourage an open discussion culture, improve the level of trust and respect for each other, and create a supportive team environment (interprofessional support). In addition, training on communication with other

professional students and conducting simulations for problem-solving skills in each phase of activity in interprofessional practice are strategies to increase group performance.

Level of student knowledge

The measurement of student knowledge was carried out by assessing the students' understanding of communication theories, the role of other professions, professionalism and empathy. However, in this programme, we designed seven modules to prepare student in IPL that consisted of communication skills for patients and colleges, role other profession, empathy, professionalism, team process, and social culture adaptation. In this programme showed that the students who undertake fully the modules in the first phase generated the significant knowledge improvement compared before the activity.

Kirkpatrick's level 3 – What the learning being applied?

The learning project showed that the achievement of students' interprofessional competencies by engaging in COMIC programme were satisfactory. The establishments of their ability to work in groups and apply collaborative practice were indicated by a high enhancement of students' behaviors (included team performance, communication skill, and teamwork skills) according to the thresholds of Cohen's effect size (outperformed by 80%). About the COMIC programme, 59 students (95.16%) agreed to integrate this programme into the curriculum because the students gained benefit during their involvement in this programme such as new knowledge and skills, learn to solve the patient's problem integrated and comprehensively, and understand deeply about their own profession and others' professions. However, it is difficult to branch out whether the positive outcomes on students are as direct influence of this programme or students' prior competencies of IPE or awfully influenced by the students' positive attitudes towards the IPE programme.

Working in a small group since the beginning is the important factor for developing the team performance and teamwork skills. To become a practitioner who can work effectively in a team, a student should learn and be exposed to team working. However, the studies involved in developing of an effective collaboration in IPE intervention among undergraduate students are challenging (22). Working in a team is not effortless, especially working with members who have different professional backgrounds. Under these conditions, the interaction among members, interpersonal skills, and group task are the factors that can affect team atmosphere and lead to internal conflict (43). By engaging in a small working group, each group has been capable of growing smoothly, facing a variety of obstacles, and solving problems or conflicts to find the best solution. This maturation process of team development was demonstrated by team ability to resolve group conflicts and find the best solutions for the team such as rescheduling group activities, arranging informal meetings with group members (they called "iMeet"), and maximizing communication with group members and the tutor by e-mail or video chat.

The improvement of students' communication skills were supported by implementing both the role-play of communication skill during first phase of this programme and simulation model. The programme showed that students could communicate effectively to the patient that was indicated by the students' ability to avoid the using of difficult terms, listen attentively, and use the simple questions for asking the patient and family. In addition, students were capable to communicate effectively with team members. However, some students wrote the comment about the difficulty to communicate with other members at the beginning of the programme.

Similarly, the students' written responses showed that students need the certain knowledge or the special skills at each phase of activity. As shown in Figure 16, for implementation of IPE in the future, it is important to prepare the specific modules to enrich

students' insight and improve students' skills. Reflection on debriefing sessions assisted students' reflections on their limitations and as a medium for students to discuss issues with the tutor. However, reflection alone is not sufficient; the faculty needs to arrange a special schedule and module to fulfill the students or groups' needs that cannot be obtained through self-learning.

Kirkpatrick`s level 4A – Organization outcome

The tutors written comments revealed that nobody doubted the positive impact and benefit of the implementation of IPE for patients, community, and health professionals. All participants stated that IPE was an initiative model that was appropriate for the current conditions in Indonesia because of the increasing public demand for better health care and improvement of cooperation among the professions for effective and efficient health services. IPE is expected to improve the health services that are currently fragmented, eliminate the hierarchy among the profession that worsen the relations between profession, as well as motivate students or professionals from any disciplines to delve deeper about their profession and other professions.

5.4 Limitations

This research project has several limitations. Research decisions have had impacts on the research. Each method of data collection and analysis brings strengths and weakness to the work, and my study is no different. The limitations of the research methods are highlighted in this section.

Firstly, this study was confined to a school of medical and health professionals in State Islamic University Syarif Hidayatullah, Jakarta that might not represent distribution of

Indonesian students across all schools. The findings may be somewhat difficult to be generalized because the sample was only derived from an institution.

Secondly, the sampling method was non-probability that may produce sampling bias. As in the case of any interprofessional programme, interprofessional learning reflects the uniqueness of the individuals involved. Moreover, the possibility of bias in this study needs to be of concern because participants who took part in this programme were volunteers and they have high positive motivations about the programme. Nonetheless, the entirety of sample represented students from various multicultural and social backgrounds, which may detract aforesaid limitations.

Thirdly, this study used a single group design and this design emerge issues of validity. However, we implemented some strategies to handle these issues such as using several of teaching methods, implementing multiple of evaluation methods, and applying longitudinal study with repeated measurements.

Fourthly, during the implementation of programme, many students withdrew from the programme. It is a challenge for the implementation of the IPE programme in Indonesia when IPE modules are not integrated in the curriculum. To reduce the drop-out rate, the IPL programme should be made a mandatory part of the curriculum.

5.5 Conclusions

Study 2 was the implementation of COMIC programme. The COMIC programme was the first initiative IPE programme in Indonesia to prepare individuals for collaborative practice in community settings. The educational programme was constructed by integrating three components of the development of interprofessional teamwork including social, interprofessional and educational preparation for interprofessional team processes (17). For the educational programme, various learning theories and social domains were utilized as

well as multiple learning methods (interactive learning, problem solving, simulation and practice in real world settings). For social and interprofessional processes of group development, the programme employed working in small group, ice-breaking activity, and reflection activity. This activity also built the new knowledge and skills through exchange of information and experiences as well as shared learning. In addition, the effectiveness of the programme was also supported by a non-classroom interaction with tutors, peer group interaction and extracurricular (non-scheduled) activities, and this was consistent with previous studies in which informal activities were an important factor for the success of the IPE programme (78). The programme yielded a satisfactory result, and opted only one method in the interprofessional programme which will not be effective to achieve the interprofessional objectives due to the difficulty in responding to the diverse needs of students (3).

The COMIC programme was performed for ten days over four months and has demonstrated the significant positive impacts on the changing of knowledge, attitude and skills among students (Level 1, 2 and 3), and specifically students' behaviors after practice in real settings changed positively to more than 80% compared with simulation sessions. Whether this result is temporary, or possibly long lasting, requires evidence from a longitudinal research design.

Chapter 6

Discussion, Limitations, Recommendations and Conclusions

Chapter 6 discusses the COMIC programme and similar programmes that had been done previously. Furthermore, this chapter will discuss the limitations of the COMIC programme, implication for practice, the recommendations for the implementation of the COMIC programme in the future, as well as the integration of the COMIC programme on the FMHS curriculum.

6.1 Discussion

Interprofessional education has been accepted as being important to State Islamic University's mission. Similar with other institutions, implementation of the IPE programmes, such as the COMIC programme, has been both challenging and rewarding. The programme forces a multitude of departments to compromise on curriculum and educational goals, which requires great cooperation. The faculty staff members involved in this programme have found new opportunities to collaborate with each other and to learn more about how the disciplines differ and how they are the same. From the student perspective, changing the learning environment from the classroom to the community setting, and changing the teaching method from passive learning to active learning, have been an eye opening experience. Students' traditional perspectives toward learning and the goals of education have been challenged. This programme is seen as a new way to learn and a meaningful experience.

In addition, the COMIC programme is a rewarding first step in introducing the students to working in interprofessional teams. In recent years, the numbers of people with complex health needs are increasing. This condition raises the greater demands on the quality health services and the qualified health professionals (12). Team care has been recommended

as a means of meeting these needs (13) as it is expected that a healthcare team will be more effective to solve health problems than an individual, as well as the teamwork and the collaborative practice are the necessary tools in handling both individual and community health problems. This situation pressed on the health providers to be able to collaborate with other professions and conducting collaborative practice. Thus, health providers who capable to collaborate with other professions and working in a team are needed, and the importance of interprofessional teamwork is becoming increasingly recognized (14).

Similarly, both the qualitative and quantitative data in this study showed that attitudes toward the theory of interprofessional learning were generally positive and remained fairly consistent over the course of the programme. This research also generates a new aspect in the study of IPE, which is about the dynamics of intragroup conflict in interprofessional learning and collaborative practice in medical and health professional students. Overall, the study indicated (1) the uniqueness pattern of intragroup conflict among disciplines and (2) a statistical significant impact for improvement of intragroup conflict across time. Therefore, this study was the first study to provide a comprehensive exploration of the complex nature of IPL among medical and health professional students in Indonesia and also in ASEAN country.

The COMIC programme and other IPE programmes

Nowadays models of IPE programmes that focused on learning in community setting were vast. A literature review by Abu-Irish (2012) showed that community-based project of IPE for undergraduate was 16.9% of 83 articles of IPE programme (26). All studies were carried out in developed countries such USA, Canada and UK/Ireland. In addition that, the IPE model that involved four professions or more were only 24.1% (20 articles). The COMIC programme is a new model of IPE programme in Indonesia and also in Asia that had some

characteristics including (1) focused on community-based, (2) combined academic setting (didactic and simulation phase) and real setting (home visit), (3) involved four professions (medicine, nursing, pharmacy and public health) and (4) students activities were supervised by a tutor team from different professions. Notwithstanding Hosny et al. (2013) reported a case study of IPE in community-based in Suez Canal University, Egypt, but this case study was different with existing IPE models. Hosny reported that the learners from medical school did not have an opportunity to interact and work in a team with learners from other professions. Medical students interacted with other practitioners in the field (38). If we referred to the definition of IPE, this case study is not an IPE programme (11).

Similarly, a systematic review of the effects of interprofessional education on learner outcomes found that successful programme featured attention to non-clinical skills (eg. communication) and employed a combination of didactic and clinical teaching as well as non-traditional teaching methods (eg. interprofessional problem based learning)(110). These elements are also present in our programme, with a large emphasis on the culture adaptation process, interprofessionally atmosphere, and supporting environment (eg. information technology, education tools) that especially facilitate a variety of clinical and non-clinical learning opportunities.

The COMIC programme has similarity with other IPE programmes from the University of Florida (Interprofessional Family Health), the British Columbia, Canada (IRPbc), the University of Washington (SITC) and the University of Minnesota Health Science (27, 29, 30, 111). The COMIC programme adopted those IPE models (such as combined three components to develop an IPE programme including component of didactic, simulation and practice) and were modified according to condition at the State Islamic University and health system in Indonesia (such as Indonesian home care model was as a template for component of simulation and practice in COMIC programme).

As for the difference between the COMIC programme and those programmes was the COMIC programme introduced a model of tutor team, which consisted of tutors from different professions. The function of tutor team is to facilitate and supervise students' activities as well as to encourage interprofessionally environment between student and faculty staff members as well as among departments at State Islamic University. Steinert (2005) described the tutor roles in IPE as facilitator, mentor, coaches, and supervisor. Effective interprofessional learning (IPL) depends on clinicians and educators being adequately prepared for their role as facilitators during classroom and practice learning opportunities (112). In the UK, McPherson et al. stated that the preparation of teachers for practice was influenced by professional bodies (through regulation and legislation), was often delivered unprofessionally, and did not necessarily address interprofessional learning and teaching. In the COMIC programme, the tutor team was across disciplines that according to the group's composition and all activities in COMIC programme were delivered interprofessionally. This is a key of success the programme.

Learning theory and teaching method

The literature suggests three models of IPE: 1) the academic model, which focuses on a number of different faculties e.g. medicine, nursing, social work, and other disciplines working together to teach, e.g. geriatric teamwork. 2) The clinical model, which focuses on healthcare delivery sites as the focus of learning, working on collaborative learning with trainees placed there by partner academic programmes. 3) The mixed model, which includes elements of both the academic and clinical models, for example, where the same faculty members serve as both educators and clinician/mentors (38). The COMIC programme adopted the mixed model in which faculty members serve as both educators (tutor/facilitator)

and clinician/mentors and involved tutors from multiple disciplines. Also, in this programme, the faculty staff members were involved in student training.

The incorporation of IPE into academic and clinical settings is a complex undertaking given the diverse range of students, professionals, and organizations involved as well as the challenges in introducing and sustaining such innovations. Based on those reasons, the development of the COMIC programme was done by considering some key factors including (1) learner-focused, (2) faculty-focused, and (3) organization-focused factors (113). For the learner-focused, this initiative implemented student-centered learning such as substituting active learning experiences for lectures, assigning problems requiring critical or creative thinking, involving students in simulations and role plays, and using cooperative (team-based) learning. Regarding the faculty-focused, this programme developed the tutor-training model according to tutor's need. While the mission of the university namely to produce graduates who are able to work in primary care, serve as the primary considerations to establish an IPE model at FMHS.

IPE model from University of Florida and University of Washington combined three components, namely component of didactic, simulation and practice. The COMIC programme also adopted three components namely phase 1 is delivering modules (didactic component), phase 2 is simulation phase, and phase three is practice in real setting. This model used the concept of Miller. In addition, learning theory that underlie IPE programme both from University of Florida and University of Washington, including COMIC programme, was theory of experiential learning (85). Some IPE programmes also integrated with adult learning and situated learning. This learning theory is considered effective on the IPE programmes that implement the concept of Miller or combine the attainment of knowledge, attitudes and behaviors (114).

For instance, to achieve IPE competencies, the IPE programmes split into three components (didactic, simulation, and practice). To apply the three components, in experiential learning theory, those components were implemented in 4 stages of learning including the abstract conceptualization, active experimentation, concrete experience, and reflective observation. All the stages were performed simultaneously. The didactic phase was a conceptualization phase that built learners' knowledge and attitude about IPE. Furthermore, this understanding is supported by the simulation phase (on the experiential learning theory is known as the experimentation phase) to build the skills for collaborative practice. At the later stage, to construct an appropriate behavior, the learners were exposed to the learning in real setting to explore learners' abilities and experiences (it called as experience in experiential learning phase). The fourth phase is reflection, which is an analysis phase to evaluate all activities on the three previous phases, to connect between the existing theory and the experiences gained by students. This concept is also effective to develop critical thinking, integrated and comprehensive (85, 114).

The model of IPE simulation in community-based was a new initiative in Indonesia although many studies had introduced the simulation models (27, 29, 30). This simulation model was a unique (Figure 5) and this was the first time that standardized patients had been used as part of interprofessional education programme in our institution. The comments and feedback from the students suggested a high level of satisfaction toward COMIC programme that applied IPE simulation model as a method for facilitating shared learning. The IPE simulation model brought a higher level of realism to the IPE experiences and served as catalyst before practice in real setting in fostering collaboration between the students.

Outcome of the COMIC programme

The ultimate objective of IPE programme was to improve collaboration and quality of care. Probably improved collaboration is both easier to achieve and quantify than the improved quality of care. Barr et al. (2000) described six levels of IPE evaluation that were modified from Kirkpatrick's (1967) classification of educational outcomes ranging from student's reaction to benefit of patient. In Hammick's et.al systematic review of more than 10,000 abstract published from 1964 to 2003 in four major databases, they found just over 400 studies evaluating IPE, but only 21 of them met the inclusion criteria for high qualitative studies. Out of these 21 studies, seven reported changes in service delivery or patient care (Level 4a or 4b). Five of these studies described IPE initiative among qualified health care practitioners and the remaining two described IPE among undergraduate health care students.

The COMIC programme did not measure the quality of care (Level 4b) but measured the impact of the programme for educational setting (Level 4a). Just like Hammick et al. mentioned about the difficulties in measuring benefits of the programme for patients (24), in this study we also have two reasons why we did not measure benefits to patients. Firstly, to design a high quality study is difficult. For the implementation of the COMIC programme, we used a single group design. As we know that, the single group design has some issues regarding validity including internal, external and social validity. In education research, it can be very difficult to run two different groups alongside if the study is only conducted in an institution. It is difficult to randomize and define a control group because the two groups of both the control and intervention groups will interact each other and it is impossible to isolate the control group. This situation emerge the issue of social validity. However, to handle the validity issues that emerged due to the application of single based group in COMIC programme, we applied multiple evaluation methods and various structure of teaching methods (70).

Secondly, benefits to patient or client may not be immediately apparent. There are many obstacles in measuring the benefits of patient because it requires (1) high number of patients, (2) long follow-up time, and (3) handling of many confounders. Many IPE studies in community setting did not report the Level 4b (benefit to the patient) (29, 30). There were many inhibiting factors to measure the benefit patient in COMIC programme such the COMIC programme was only done in 16 weeks (4 months); students who were involve in this programme were third-year students (pre-clinical stage); the meeting with real patient was a new experience for students; and high mobility of the population who live in the village so it is difficult to follow up.

6.2 Implications for practice

As explained at the beginning that the building of IPE competencies were a complex process. Similarly, the development of IPE programme was also a complex task and required an integrated and comprehensive implementation. Based on the findings of this study, there are several factors to consider for the implementation of IPE programmes, particularly the COMIC programme. These factors are not only the analysis based on the results of this study but are also associated with the results of previous studies.

1. Ice-breaking activity

Previous studies showed the effectiveness of the ice-breaking activity in group development. In this study, we applied the ice-breaking activity to facilitate students in the learning process. As the learning united students from various disciplines, the early stage of implementation of this programme is a critical phase. Many studies suggested that students who were involved in IPE learning would feel apprehensive and discomforted (83) and tension would arise when students met another student for the first time (83, 115) due to their

involvement in a new programme and the presence of socio-cultural differences and differences of roles and professional backgrounds. Applying the ice-breaking activities yielded a satisfying atmosphere for further learning because these activities engaged the group and promoted interactions, built trust and respect, and fostered cooperation and teamwork (116).

2. Reflection activity in debriefing process

Reflection activities in the debriefing session are considered as a factor affecting the success of this programme (117). Previous studies showed that students who are reflective individuals are few, so applying reflective activities in the debriefing process has assisted students to link theory to practice or otherwise connecting the experience gained with the existing theory, critical thinking and discussing how to perform professionally in complicated conditions (86). Although the learning process in this programme was delivered in a variety of methods (such as interactive lecture, simulation and task training in contextual and repetition), the significant learning process occurred when students revealed explicitly their deep insights through reflection activities (87).

In this study, the reflection activities had helped students in the learning process. When the students engaged in reflection and group discussion sessions with members of the group and the tutor team, students get feedback, share the knowledge, and find the solutions to solve the problem. Debriefing activities that performed after the simulation activities and patient visits in this programme showed a great benefit to the learning process and the achievement of student competencies.

3. Competencies to support activities in IPE

There are two main basic competencies needed by students in participating in IPE activities. The first is the professional competencies, and the second is the soft-skills that include teamwork skills, adaptation and acceptance with different professions and cultures, organization behavior, etc. Those basic competencies are important and play a role in the successful implementation of IPE programme. In this programme, we prepared modules of soft skills that were needed in IPE. However, during the process of implementation of the programme, students need the knowledge and professional skills to support their profession's ability in managing patients. Our result showed that students required some specific competencies at a particular phase during programme period. As an illustration, the students required "the management skills" in the first visit but the competency of "think comprehensively" was a necessary competency on the third visit. Therefore, the provision of learning activities that support student's needs in the ongoing activity should be considered.

4. Tutor: Role and training

The role of tutor is an important factor (118, 119) for the success of this programme (120). A facilitator or tutor is a person who helps the student to work together. The facilitator is not a teacher; he or she is not "teaching" in the meaning "transferring information", rather a person who can start intellectual processes by asking the right questions(112, 119). Aside from being tutors, facilitators, coaches or mentors(112), another role of tutor is as a role model to provide the constructive understanding and the positive learning for collaborative practice (121). For complex learning like IPE, students need a role model to understand some elements that they have not been exposed before such as how the role model to respect other professions, how to discuss matters with different disciplines and how to work in a team (121).

Facilitators from each profession represented by students must be available. In this study, we introduced a new model, i.e. the tutor team that consisted of four members from different professions. The tutor team tasked to supervise, monitor and evaluate each group and a tutor team also acted as a role model. This model aimed to provide opportunities for tutors to conduct collaborating interprofessionally (122). In fact, our study showed that the tutors also need the experiences to work and discuss with different professions. In other word, the tutors themselves must be collaborating interprofessionally. If the tutor teams are not collaborating interprofessionally, the student team probably will not do activities interprofessionally.

Although the application of this model involved quite a lot of tutors from different disciplines, whereas the limited number of teachers in our faculty is one of the classic problems, however this study showed the effectiveness in the development of student competencies. This model also helped students to understand how to work in teams and how to respect and understand other professions (11, 78, 118, 121). The main issue of this model is its sustainability because of the manpower problems. In the future, this model can be modified. Facilitators may not need to be present all the time, but every student should have the same opportunities and experiences to discuss and interact with and get feedback from tutors who have different professional backgrounds along the learning process in an interprofessionally manner.

IPE is a new initiative at State Islamic University, Jakarta. It is not easy to start facilitating interprofessional education without any previous interprofessional experience. In the learning process, the IPE tutors needs to use a pedagogic method allowing the students to learn from each other. Therefore, the tutor will need to develop their pedagogic skills by providing the training for tutor and facilitating regularly meeting among tutors to exchange their experiences and social development. Moreover, the tutor also is expected to keep the

contact with his or her own profession to develop professional skills and stay informed about progress in their professional area. It is important for tutor's professional skills improvement and also provide benefits for students. Feedback from students is considered as important information for the development of tutors' teaching skills.

5. Developing of teamwork skills

In recent years, the number of people with complex health needs is increasing, and this condition raises the greater demands on the quality health services and the qualified health professionals (12). Team care has been recommended as a means of meeting these needs (13) because it is expected that a health team will be more effective to solve health problems than an individual as well as the teamwork and the collaborative practice are the necessary tool in handling both individual and community health problems. To develop practitioners who can work effectively in a team, they should learn and be exposed to teamwork activities during their training. Educational institutions that implement learning systems whether uniprofessional or multiprofessional are expected to encourage the students to learn, work and practice in the group, to adapt and respect to other professions, and to develop the individual skills for providing the effective health services (12).

An effective team will be able to achieve their goals by working effectively together (123). However, working in a team is not a simple task, particularly when working with different professional backgrounds. To become an effective team, each team must undergo the group development process (15). It is known that the process of formation and development of a team in interprofessional learning (IPL) does not necessarily occur in sequence through the usual phases (16, 17). During IPE in community-based health care, the students have great opportunities to practice teamwork. For example, when conducting group discussion and patient visit, the participants deal with the overlapping of some competencies.

In interprofessional health teams, overlapping the competencies will be linked to the responsibility and authority to manage patients. If the rule of professional responsibilities were blurred then this condition will lead to the intragroup conflict (14). Nevertheless, the participants stated that they were able to handle this situation by constantly interacting in teamwork with other group members so that each group member comprehended and was capable to overcome this problem.

6. Timing for introducing IPE

There has been a debate about when to introduce IPE into the health care educational programmes. We have noticed a possible trend in the literature towards the opinion that IPE should be introduced early during the educational programmes. The findings in this study also support early introduction of IPE. Firstly, the students who participate in educational programme, who based their written comments in relation to their professional experience, suggested to introduce IPE since the first year. Second, the tutors clearly argued for early introduction of IPE to develop practitioners who have a comprehensive understanding of the IPE. Since working in interprofessional team is essential to deliver quality health care and to provide a skilled health provider, these students may need more and earlier training in interprofessional teamwork (76, 113).

7. Interprofessional support: organizational and faculty support

At higher educational institutions, IPE is often difficult to be established since the fragmentation among disciplines separate organizational and academic structure, particularly in medical disciplines. Previous study showed that one of success for implementation of IPE programme is when teachers from different disciplines work together (124).

At State Islamic University Syarif Hidayatullah that established in 2005, we started from the beginning with four educational programmes and all disciplines are in the same building. This system model is expected to be the potency for development of IPE in the future because of facilitates the teachers to work together. Likewise, to support the idea of IPE, colleagues and staff members must be invited to learn and thereby understand the purpose and possible outcome of the IPE initiative. This strategy is important to introduce multiprofesional learning, revise or modify their way of teaching, and to eliminated the arrogance and abuse power as factors preventing interprofessional relationship (14, 119).

6.3 Recommendations for future research

The programme was successful in its implementation and gave positive impact for students and faculty, but there are issues that should be considered for further implementation. Firstly, the high rate of student withdrawal from the programme suggests the implementstion of IPE programme in a structured module in the curriculum and requires a university structure that actively fosters collaboration across departments and faculty/discipline boundaries (119).

Secondly, the involvement of a tutor group from four disciplines to observe each student group in patient visit and debriefing session needs to be taken into consideration if the number of faculty staff members is limited. Nevertheless, the effectiveness of programme implementation and achievement of the students' abilities needs to be anticipated.

Thirdly, because the students who were involved in this programme were third-year students and they had never treated real patients, the students' responses stated that they required specific knowledge or skills in all phases during this intervention. The provision of learning activities that support student's needs in the ongoing activity should be considered.

Fourthly, the implementation of the IPE programme that involves patients either in a hospital or in community needs to consider the determination and selection of patients' problems and the educational level of students who would be involved in the programme because gaps in those factors would lead to conflict in groups and eventually would interfere with the learning process.

Fifth, the ultimate goal of IPE is to improve the quality of care, but the effect of the programme for patients and communities (Level 4B) were not measured in this study. Further studies to explore the impact of IPE on quality of care in Indonesian context are considerable.

6.4 The future of COMIC programme at FMHS, State Islamic University

The findings provided evidence of an important dimension of COMIC programme in this setting. It illustrates the positive significant of interprofessional competencies and positive impact for institution. Although we successfully involved each profession in the development and application of the COMIC programme, the implementation phase generated additional challenges.

Figure 18 describes the plan of implementation of COMIC programme at FMHS in the future. This plan is based on students' feedback after being involved completely in the COMIC programme, which the study shows that students required some specific competencies when applying the concept of IPE learning at a particular phase. Our study evidenced that students' need toward some skills to manage patient problems and to interact with other members were different between on 1st patient visit and 3rd patient visit. In addition, activities in the COMIC programme were tight which was over 15 weeks therefore students felt heavy workload. This condition caused conflicts in groups and high level of dropouts. In addition, the issue for interprofessional practice is to ensure that the context of interprofessional team will provide the opportunities to work together towards an agreed aim,

communicate with and respect each other, and learn in an interprofessional environment. By considering the above and the opinions of tutors to commence IPE activities from the beginning, the COMIC programme activities were divided into three phases over five years (Figure 18).

First phase is Foundation of IPE (FIPE) that is started from first to third-year (FIPE 1, 2, and 3). During this phase, students learn at academic setting and community setting by working with healthy family. Main content of foundation of IPE include the communication skills (for patient and different profession), teamwork skills, understanding role of own profession and different professions, managing the group conflict, and social culture adaptation process. Those contents increased students' knowledge and insight for IPL and working in group during the COMIC programme. Delivering of modules during phase of foundations of IPE is carried out by interactive lecture, group dynamic, problem based, and simulation.

Second phase is Basic Interprofessional Working (BIPW). This phase is a transition between the preclinical stages to clinical stage and conducted at the end of third year or before clerkship at hospital. During this phase, students conduct interprofessional practice by managing a real patient. Since this is a transitional phase, the selection of cases should be the simple disease such as common disease or acute disease.

Third phase is Interprofessional Ward and Community (IPWC) that is started from fourth to fifth year. This phase is an interprofessional collaboration, which students will work with both other students from different professions and professionals in hospital or health center. During this phase, students will manage the patients comprehensively from diagnose to treatments (including curative and prevention). This stage will be implemented during internship in the ward or department with a long apprenticeship period (more than four weeks

per rotation), such as an intern in the department of internal medicine, pediatric, surgical, obstetrics, and medical communities.

Figure 18 Framework of implementation COMIC programme at FMHS

The main challenge in the implementation of this model in FMHS is the implementation of IPWC phase both first and second stages. This is related to the issues such as (a) the issues of fragmentation of medical services and hierarchy between professions at hospital, (b) multi specialization and sub-specialization in each discipline therefore causing overlapping of duties and responsibilities and (c) the no experiences in IPE implementation in

wards. The strategy to deal with this challenge in hospitals is to increase communication with all departments and curriculum committee of each professionals programme in order to increase the understanding and integration of this initiative into faculty's curriculum and hospital's mission (125).

In a systematic review of IPE studies, Cooper et al. (2001) identified several obstacles to success the implementation of IPE including (a) a lack of time, (b) varying educational schedules and assignment and (c) financial resources. In addition, the IPE activities as if being a burden on student learning. Several of these challenges will be relevant to our initiative particularly those regarding the establishing of IPE curriculum for each discipline and faculty support for scheduling and timetables. To deal with several of those challenges, the COMIC programme will be implemented gradually and longitudinally over a period of 5 years by integrating all modules and learning activities that are similar and scattered in each discipline, into the COMIC programme. It is a strategy to reduce the burden of student learning. For example, module of communication, professionalism (included role profession, empathy and ethic), community visit, problem solving and patient management that are part of curriculum in each profession, will be integrated into the COMIC programme.

Besides that, faculty development for IPE activities is also issues that need to be considered. In FMHS, the faculty development programme for IPE field is main agenda since a lack of expert for IPE programme. Several previous studies reported that the faculty development programme should be carried out in several stages such as the formation of committees across disciplines, the recruitment and training of faculty staffs from both different disciplines and different institutions as well as the expansion of cooperation with units of other health services.

6.5 Conclusions

We demonstrate in this study that first, scales of atmosphere in group (AIG), conflict in group (CIG) and readiness for interprofessional learning (RIPL) in Indonesian version are a valid and reliable scale used to measure student's attitudes. The translation and adaptation of the scales into the Indonesian language by a cross-cultural adaptation process was successful and to my knowledge, it is the first study to investigate those scales in the Indonesian context.

Second, the COMIC programme, as an IPE pilot model in Indonesia, demonstrated to be an effective programme to develop the attitudes, knowledge and skills of students in IPL in the community. This effectiveness was indicated by the significant improvement of students' interprofessional competencies.

Furthermore, we identified that the learning model in the COMIC programme yielded the relevant learning experiences with IPE. In addition, a tutor team is considered having a great influence to help students understand this learning through reflection activities, supervision and mentoring. We also consider this study as a step forward in examining both the conflict in interprofessional health teams and the effectiveness of the COMIC programme in improving the group process and reducing conflict in group.

The success of the programme was underpinned by a set of methods including 1) an integrated programme design based on theoretical grounds in the learning and social domains, 2) applying the multi-method of teaching and evaluation, 3) using small group learning techniques, 4) practical-based and reflective learning, and 5) implementing the supportive learning environment. Taken together, these results suggest that COMIC programme is a promising programme for interprofessional learning in community setting in Indonesia, by providing the evidences of significant improvement of student's competencies and the relevant learning experiences for students about IPE and the real setting. This programme is a

unique and a valuable learning opportunity that will be repeated with some modification in the future. This template may be useful to others wishing to develop a similar initiative.

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Appendix 1

Questionnaire Items

1. Form of Tutor Check List

1	2	3	4	5	6	7	8	9	10
Low	—————								Perfect

INDICATOR	ASSESSMENT				
	STUDENT				OVERALL GROUP
	Medicine	Nursing	Pharmacy	Public Health	
<i>1. Team performance (TP)</i>					
Speed					
Quality of team work					
Fluidity of team work					
Freedom of errors					
Communication between team members					
Decision-making					
Overall performance					
<i>2. Communication skills (CS)</i>					
Communicate effectively with team members					
Does use commonly known technical terms					
Explains unknown terms					
Listen attentively					
Uses easily understood questions					
Uses easily understood comments					
<i>3. Teamwork skills (TS)</i>					
Is courteous to team members					
Respect to the professional knowledge and skills of team members					
Accepts responsibility for professional actions					
Collaborates well with team members					

2. RIPLS Scale

1	2	3	4	5
Strong disagree	Disagree	Neutral	Agree	Strong agree

No	Statement	1	2	3	4	5
1.	Learning with other students / professionals will make me a more effective member of a health and social care team					
2.	Patients would ultimately benefit if health and social care students / professionals worked together					
3.	Shared learning with other health and social care students / professionals will increase my ability to understand clinical problems					
4.	Communications skills should be learned with other health and social care students / professionals					
5.	Team-working skills are vital for all health and social care students / professionals to learn					
6.	Shared learning will help me to understand my own professional limitations					
7.	Learning between health and social care students before qualification and for professionals after qualification would improve working relationships after qualification / collaborative practice.					
8.	Shared learning will help me think positively about other health and social care professionals					
9.	For small-group learning to work, students / professionals need to respect and trust each other					
10.	I don't want to waste time learning with other health and social care students / professionals					
11.	It is not necessary for undergraduate / postgraduate health and social care students / professionals to learn together					
12.	Clinical problem solving can only be learnt effectively with students / professionals from my own school / organisation					
13.	Shared learning with other health and social care professionals will help me to communicate better with patients and other professionals					
14.	I would welcome the opportunity to work on small group projects with other health and social care students / professionals					
15.	Shared learning and practice will help me clarify the nature of patients' or clients' problems					
16.	I am not sure what my professional role will be / is					
17.	I have to acquire much more knowledge and skill than other students / professionals in my own faculty/organisation					
18.	Learning with other students / professionals will make me a more effective member of a health and social care team					

3. Conflict in-group and atmosphere group scale

1	2	3	4	5	6	7
Very strongly disagree	Strong disagree	Disagree	Neutral	Agree	Very strongly agree	Very strongly agree

Statement	1	2	3	4	5	6	7
Members in my team trust each other.							
Members in my team feel comfortable delegating to others in the team.							
Team members are truthful and honest.							
Team members respect each other.							
Team members respect each others' ideas.							
In my team we discuss issues openly.							
In my team we communicate openly.							
In my team conflicts are dealt with openly.							
There is a lot of friction among team members.							
There are personality conflicts evident in my team.							
There are tensions among members of my team.							
There are emotional conflicts among members of my team.							
Members in my team disagree about opinions regarding the work being done.							
There are conflicts about ideas in my team.							
There is conflict about the work in my team.							
There are differences of opinions in my team.							
There are disagreements about who should do what in my team.							
There is conflict about task responsibilities in my team.							
There is disagreement about resource allocation in my team.							

4. Student satisfaction scale

1	2	3	4	5	6	7
Very strongly disagree	Strong disagree	Disagree	Neutral	Agree	Very strongly agree	Very strongly agree

Statement	1	2	3	4	5	6	7
I learned something that helped me in my present work.							
The co-learning experience provided me with new ways of thinking about my work.							
Co-learning was a valuable part of the overall curriculum.							
I would recommend this experience for everyone in health care education.							
My time is well spent.							
I would recommend this experience to others in my programme.							

Appendix 2

Training of Team Development and Group Dynamic

Educational Goal:

Build teamwork skills to conduct collaborative practice in community health based care.

Objectives:

The learner will be able to:

1. Explain the stages of team development and be able to give an example of each stage
2. Explain the process of team development
3. Understand about teamwork and role as team member
4. Understand about individuals role in a group
5. Predict the benefits of working together in a team
6. Interact with one another in a teamwork
7. Appreciate the benefits of working together as a group or team

Teaching Strategy

1. Applying “Synergy” game to build teamwork between all learners who participate in interprofessional learning
2. Applying “Broken Squares” game to build cooperation among members group through the solving of a group problem

Facilities: seminar room, synergy game tools, broken Squares game tools

Time:

1. Orientation : 15 minutes
2. Synergy game : 30 minutes
3. Broken Squares game : 30 minutes

SYNERGY Game

The first part of this lesson starts by using the “Synergy” exercise to have small groups work together toward a goal. The “Synergy” activity is a fun way for learners to begin to work together to solve a seemingly insurmountable task. The synergy portion of the lesson develops the concept of “the whole is greater than the sum of its parts” and power of teamwork. The great thing about this activity is that it works by the sheer numbers of people—increasing from an individual to a group to the entire class. Be observant and use the learner insights for the discussion points. Using this exercise and the class development, the teacher should have numerous examples of team growth

Time required: fifteen minutes for the exercise and fifteen minutes for discussion.

Materials Used: pencils, blank paper, table, chair, non transparent screen or partition, 50 kinds of items.

List of 50 items:

- | | | | |
|----------------------|--------------------|---------------------|------------------------|
| 1. Flag | 2. Calculator | 3. Back Scratchier | 4. Small Alf character |
| 5. Ceramic Egg | 6. School Calendar | 7. Wooden Ruler | 8. Horseshoe |
| 9. Pine Cone | 10. Scissors | 11. Toy Figure | 12. Ring |
| 13. Toy Car | 14. Paper weight | 15. Elephant Statue | 16. Battery |
| 17. Tongue Depressor | 18. Meda | 19. Small Plaque | 20. Cameo Pin |
| 21. Coin Set | 22. Cork Screw | 23. Dart | 24. Small Roller |
| 25. Lighter | 26. Cloth Patch | 27. Military | 28. Ball Point Pen |
| 29. Floppy Disk | 30. Cork | 31. Single Die | 32. Window Ornament |

- | | | | |
|---------------------------|---------------------|------------------------|-------------------------|
| 33. Sales Slips | 34. Metal Whistle | 35. Small Disco Ball | 36. Letter Opener |
| 37. Photo of Teacher | 38. Small Wrench | 39. Unicorn Statue | 40. Yellow Marker |
| 41. Pair of Glasses | 42. Picture ID Card | 43. Stick of Gum | 44. Perfume |
| 45. Sales Book | 46. Job Application | 47. Plastic Fork | 48. Refrigerator magnet |
| 49. Empty McDonalds Fries | | 50. Small Screw Driver | |

Physical Setting:

1. The 50 items are put on a table.
2. Between this table and students are separated by screen (non-transparent screen) or partition

Process:

1. The definition of Synergy is “The whole is greater than the sum of the parts.”

The concept of Synergy comes from Stephen Covey’s book called *7 Habits of Highly Effective People*. Behind this screen I have 50 items that I want you to view for 35 seconds. Try to memorize as many items as you can. I will bring you up to view the items in groups of threes; however, you cannot talk to anyone once you have seen the items. Just come up and look for 35 seconds and return to your seat and write down on the piece of paper as many items as you can remember.

Once you have finished, just put your pencil down and keep trying. Remember, *No Talking!* (Put learners in groups of three and provide them with a piece of paper and pencil and the following instructions. Have each group view the items and allow time for each person to remember as many items as she can. Ask them to count how many items they were able to remember. Take the highest and the lowest numbers and calculate the percentage of each. The high and low numbers serve as the range the group obtained working as individuals.

Write these figures down on the chart. Then provide the next step of instructions.)

H _____ = _____%

L _____ = _____%

1st Step

2. Now, I want you to work in your triads.

I want you to consolidate your three lists into one. Now count how many items you have. You just worked in a team using each other’s memory to improve your numbers.

H _____ = _____%

L _____ = _____%

2nd Step

Take the highest and the lowest numbers and arrive at the percentage of the total items. Write these figures down on the chart. Then provide the next step of instructions.

Now let’s see how many items we can remember as a total class.

I want the group with the highest number to list the items they have.

H _____ = _____%

3rd Step

3. Continue to go to all the groups to see whether they have any more items that can be removed.

Take the final number and arrive at the percentage of the total items. Write this number down on the chart. Allow time for the class to try to recall any other items through a collective memory process of association by shape, color, and description. Once they have exhausted their guesses, remove the final items slowly. The reaction of the learners should be the sign of the success of the activity.) This activity will prove the point that we gain strength from a team effort. The key is that people tend to remember different items, so the number is bound to increase, proving the whole is greater than the sum of the parts. At each step the range of items will increase, showing that as we work together we increase our potential (1+1=3).

Question: So what did we learn from this lesson?

BROKEN SQUARES Game

Goals

1. To analyze certain aspects of cooperation in solving a group problem.
2. To sensitize the participants to some of their own behaviors, which may contribute toward, or obstruct, the solving of a group problem.

Materials Used

- Chalkboard, chalk, eraser, or flipchart and markers.
- Tables that will seat five participants each.
- One set of instructions for each group of five participants and one for the observer/judge.
- One set of broken squares for each group of five participants.

Physical Setting

Tables should be spaced far enough apart so that the various groups cannot observe the activities of other groups.

Process

The facilitator may wish to begin with a discussion of the meaning of cooperation; this should lead to suggestions by the groups of what is essential in successful group cooperation. These may be listed on the board, and the facilitator may introduce the exercise by indicating that the groups will conduct an experiment to test their suggestions. Basic suggestions that the facilitator may want to bring out of the groups are as follows:

1. Each individual must understand the total problem.
2. Each individual should understand how he/she can contribute toward solving the problem.
3. Each individual should be aware of the potential contributions of other individuals.
4. There is a need to recognize the problems of other individuals, in order to aid them in making their maximum contribution.

Instructions are as follows:

1. When the preliminary discussion is finished, the facilitator chooses an observer/judge for each group of five participants. These observers are each given a copy of their instructions. The facilitator then asks each group to distribute the envelopes from the prepared packets. The envelopes are to remain unopened until the signal to work is given.
2. The facilitator distributes a copy of the instructions to each group.
3. The facilitator then reads the instructions to the group, calling for questions or questioning groups as to their understanding of the instructions. It will be necessary for the facilitator or his/her assistants to monitor the tables during the exercise to enforce the rules that have been established in the instructions.
4. When all the groups have completed the task, the facilitator will engage the groups in a discussion of the experience. Discussion should focus on feelings more than merely relating experiences and general observations. Observations are solicited from the observer/ judges. The facilitator may want the groups to relate this experience with their "back home" situations.

Appendix 3

Informed consent – for student

(Please read to respondent before asking for permission to participate in this study)

Research Title: Evaluation of interprofessional learning in community-based health care for medical and health professionals students in Indonesia

My name is I am representing the University of Tokyo in Japan and the State Islamic University Syarif Hidayatullah, Jakarta in Indonesia.

The purpose of this study is to develop a new learning model for medical and health professionals student that are important to improve health care quality for patient and community and health professionals competencies. The information from this study will help the health professionals institutions and/or the government of Indonesia to formulate the policies to improve the quality of education by reforming the curriculum, improving the higher education system, etc. Although there might not be an immediate benefit in participating in this study, your participation is very helpful for education planning and has the potential to provide ideas to improve the current situation of medical and health education system in Indonesia.

In this programme, we provide various modules and teaching methods and you will involve and actively participate in each session. The programme divided into three phases. First phase, that aimed to prepare you in this programme, and then you will involve in some workshops. Second phase, you will be trained some skills related to this programme in simulation session. First and second phase will be conducted in faculty building. Third phase, you and your team will visit a patient and tutors will accompanied you during the visiting activities. The programme will conduct every Friday afternoon for first phase and Saturday for second and third phase. Total days for all activities are ten days in three month. In this regard, I would like to ask you to participate in this programme.

There is no possible risk if you agree to participate in this programme. All of the information that collected during this programme will be kept strictly confidential; Your name will not be used and you will not be identified I ay way.

This study has been approved by the ethical review committee at the University of Tokyo and the State Islamic University Syarif Hidayatullah Jakarta. This research is funded by the University of Tokyo. As a gratitude we will provide you lunch during simulation session, transportation fee for visiting patient from the campus to the patient house.

Your participation is absolutely voluntary and there is no penalty for refusing to take part. You are free to ask any question. You may refuse to be in this programme process and quit from this programme any time. You may ask any question about the study at this time and if you have further questions about this study please do not hesitate to contact.

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If you agree to participate in this study please write the date and your name below.

Signature: _____ Date: _____

Appendix 4

Informed consent (for patient)

(Please read to respondent before asking permission to participate in this programme)

Research Title: Evaluation of interprofessional learning in community-based health care for medical and health professionals students in Indonesia

My name is I am representing the University of Tokyo in Japan and the State Islamic University SyarifHidayatullah, Jakarta in Indonesia.

The purpose of this study is to develop a new learning model for medical and health professionals student that are important to improve health care quality for patient and community and health professionals competencies. The information from this study will help the health professionals institutions and/or the government of Indonesia to formulate the policies to improve the quality of education by reforming the curriculum, improving the higher education system, etc. Although there might not be an immediate benefit in participating in this study, your participation is very helpful for education planning and has the potential to provide ideas to improve the current situation of medical and health education system in Indonesia.

In this study, the students and supervisor will visit you at home for three times. Student will interview you, interview your family member(s) and conduct physical examination such as blood pressure, body weight, body height, body temperature by using medical form, and those activity will be supervised by medical doctor and nurse.

In this regard, I would like to ask you to participate in this study.

There is no possible risk if you agree to participate in this programme. All of the information that collected during this programme will be kept strictly confidential; Your name will not be used and you will not be identified any way.

This study has been approved by the ethical review committee at the University of Tokyo and the State Islamic University SyarifHidayatullah Jakarta. This research is funded by the University of Tokyo. As a gratitude we will give you souvenir at the end of the programme.

Your participation is absolutely voluntary and there is no penalty for refusing to take part. You are free to ask any question. You may refuse to be in this programme process and quit from this programme any time. You may ask any question about the study at this time and if you have further questions about this study please do not hesitate to contact.

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If you agree to participate I this study please write the date ad your name below.

Signature: _____ Date: _____

Appendix 5
Ethical Review