# Interprofessional Education, Lessons from Indonesia

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To my family
for their unconditional love

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DISSERTATION

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CHAPTER I

# GENERAL INTRODUCTION

Health problems are getting complex all over the world. The challenges of health services are even more severe in Indonesia, since the country has to deal with health problems of a very large and diverse population of around 269 million people, its total area spanning 13,600 islands with different races, ethnicities, religions, social strata, education and community languages. Healthcare services such as hospitals and public health services face health problems of such complexity that they require the skills and knowledge of a healthcare professional team that can work together in preventive, promotive and curative services to improve healthcare outcomes [1-3]. The assertion that interprofessional collaborative practice (IPC) will play an important role as a strategy to address the complex healthcare problems has been explained in a policy document by the World Health Organisation (WHO) [4, 5]. Interprofessional collaborative practice aims to improve the coordination of healthcare services, the proper utilisation of healthcare resources, the outcome of healthcare and services and the safety of patients [4]. Initiatives to improve collaboration between healthcare professionals in healthcare practice have been developed firstly to provide comprehensive healthcare services to the patients and family and secondly to afford the opportunity to strengthen the healthcare systems and improve the quality of healthcare outcomes. [6]. The aim of such collaboration is to decrease patients' complications, the length of hospital stays, tension and conflicts among healthcare professionals, staff income, hospital fees, clinical error rates, and mortality rates [4]. However, research has suggested that although the potential of IPC is clear, its execution is not self-evident nor without problems.

Poor interprofessional collaboration by the healthcare professional team in particular has posed significant threats to patient safety and care in the form of adverse patient outcomes, longer hospital stays, and even medical errors [7-11]. Previous studies have reported many issues that may prevent effective collaboration among healthcare professionals. These factors include professional aspects, such as a lack of knowledge about and trust in other health professionals' expertise and clinical skills, and a lack of understanding of the roles of other professionals [12-14]. Ineffective communication has also been reported as a common barrier to effective healthcare collaboration causing the team to overlook information, be misinformed or misinterpret information, give unclear orders and overlook critical elements [15, 16]. Other than that, effective interprofessional healthcare team collaboration has been demonstrated to be hampered by the healthcare team culture, such as unequal participation in decision-making due to unequal power relations and historical hierarchical team relations among health professionals [12, 17-19]. Moreover, the perception that other health professionals would be inferior to doctors has hampered active participation in solving patients' problems by other members of the healthcare team [20]. In the context of Indonesia, healthcare professional collaboration issues are exacerbated by a very strong culture of social hierarchy. Doctors are perceived to have the higher positions in society, whereas healthcare professionals other than doctors, such as nurses and midwives, are marginalised. This situation affects effective interprofessional teamwork and collaboration within healthcare teams [21-23].

## INTERPROFESSIONAL EDUCATION

Health professional education (HPE) has traditionally been conducted in uni-professional silos that focus on discipline-specific contents [24, 25]. However, the question has been raised whether these educational silos will adequately prepare the future healthcare professional [26, 27]. No longer is being an expert in one's own field sufficient, and HPE is challenged to produce future healthcare providers who are adaptable, flexible, good team workers, able to collaborate effectively, and have good interpersonal and professional skills [3, 28, 29]. Furthermore, healthcare professionals of the 21st century should possess competencies such as the ability to: 1) provide patient-centred care; 2) work in interprofessional teams; 3) practise evidence-based medicine; 4) focus on quality improvement; and 5) utilise information technology [30]. Interprofessional Education (IPE) in both the preclinical (undergraduate) and clinical phase has been suggested as a strategy to achieve these competencies [5]. More specifically, IPE is thought to produce health professionals who have the knowledge, attitudes and collaboration skills to affront and overcome barriers to present interprofessional collaboration within a healthcare environment that is inherently challenging and dynamic [4, 28, 31, 32].

The essential premise of IPE is that when two or more health professional students learn together from the early phase to the end phase of their training, when entering their future working practice they will be well prepared to work collaboratively [24, 33]. The WHO defines IPE as 'a phenomenon that takes place when two or more healthcare professions learn about, from, and with each other with the goal of collaboration and improved health outcomes as the end objective' [4]. When unpacking this definition which is widely cited in the IPE literature, 'to learn with' means that, in solving patients' healthcare problems, students build and share knowledge collaboratively, 'to learn about' means each member of the interprofessional group should develop an understanding of other professionals' beliefs and values as well as their knowledge and actions, and 'to learn from' refers to expanding one's own professional knowledge and perspectives and creating new knowledge by recognising the knowledge of other professions. In order for IPE to apply, all learning dimensions should be presented in the concept of 'inter'. Simply instructing students from different professional groups to be in contact and work and study in the same learning setting is not enough [34, 35]. It is also imperative to know that learning in interprofessional education does not imply learning to practise the work of other professions, but to get an understanding of the work and expertise of other professions, so that students in the interprofessional group can constructively interact in the same context, with the same learning outcome of enabling collaboration and confirming the best care for patients. Therefore, in defining IPE one must consider the situations in which IPE does not occur, which is the case when: (1) students from different health professional programmes learn together in the same classroom but there is no opportunity for reflective interaction; (2) there are faculty members from different health professional programmes who facilitate IPE but do not explain to students how professionals from different background should interact and collaborate with each other

within an interprofessional team; and (3) the interprofessional student team is led by one professional but he or she does not solicit input from all group members [36]. Multi-professional education, which occurs when two or more health professional students learn alongside one another but experience no interaction, is not considered to be IPE either [37].

Various organisations have tried to define the outcomes of IPE, that is, the 'core competencies for IP collaborative practice'. One of these frameworks has been defined by the American IPEC and is organised around four overarching competencies: '(1) interprofessional teamwork and team-based practice, (2) interprofessional communication, (3) values/ethics for interprofessional practice, and (4) roles and responsibilities for collaborative practice' (American IPEC, 2011). These competencies should be developed in the context of patient-centredness and a community/population orientation. Figure 1 provides an overview of these competencies and the context in which they should be applied. IPC competencies should be achieved by engaging in an IPE learning continuum stretching both the undergraduate and postgraduate phase.

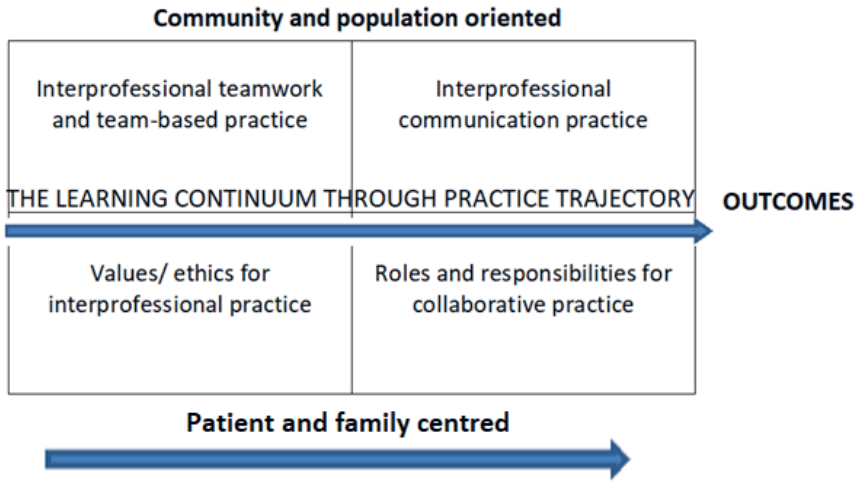


**Figure 1.** Interprofessional Collaborative Practice Model of Competencies (adapted from IPEC 2011)

## CHARACTERISTICS OF IPE PROGRAMMES AND THEIR OUTCOMES

Currently, IPE has been implemented globally in various education formats including interprofessional ward-based training [38-42], case-based discussion [43-47], team-based clinical simulation [40, 48-52], e-learning [53, 54], ambulatory primary care [55, 56], problem-based learning (PBL) [57-61], rural clinical placement and community-based education [62-69]. The key factor in effective learning in these interprofessional education programmes is student interaction

[70, 71] which should be stimulated through interactive, collaborative, reflective and experiential education formats [72]. As several barriers to IPC have been experienced in practice, topics such as power relations and professional conflicts inherent in healthcare teams should also be addressed [73, 74].

The IPE literature has reported that interprofessional education stimulates health professional students to improve their communication skills and increase their understanding of other professions' roles [75]. Within IPE, students experience collaborative practice and less stereotyping [37] even though evidence for long-term effectiveness of IPE is still minimal [76]. The influence of IPE on learners has also been systematically reviewed in the Best Medical Education (BEME) Guide No. 39. [24]. The results indicate that, in general, learners responded well to IPE. Moreover, their attitudes towards collaborative learning improved, and they had the knowledge and skills necessary to conduct collaborative healthcare practice. The findings also reported that faculty development programmes are crucial since facilitators who understand the concept of interprofessional education and interprofessional collaborative practice would support the teaching of interprofessional education and students' current and future collaborative practice.

## BARRIERS TO INTERPROFESSIONAL EDUCATION

Although HPE programmes, accrediting bodies, and other healthcare regulating organisations recognise the importance of IPE, not all health professional education institutions have implemented IPE [77, 78] due to some barriers. When it comes to implementing IPE, the curriculum presents a challenge. Every health professional school has their own established curriculum which is normally quite packed, undermining flexibility and change [79]. Studies have reported that one of the problems encountered when implementing IPE is scheduling. Therefore, to create an environment for IPE, scheduling needs to be addressed [36, 79, 80].

Leadership has become an important issue for IPE implementation. Poor planning [81], problems with coordination and organisation [82], and a lack of support by administrators [83, 84] have been reported as some of the leadership problems institutions face when initiating IPE implementation. To address leadership challenges, principals or directors of HPE institutions must develop IPE teams by identifying committed champions to spearhead the IPE programme. The IPE actors should be involved from the planning stage, including in the seeking of support, implementation and evaluation of the programme [81, 85]. Barriers to resources have been reported, referring to logistical issues of limited human and financial resources [77, 80, 86].

Faculty members may also present a barrier to IPE. Faculty and facilitators who are not trained in IPE will not understand the aim of IPE and will be uncomfortable facilitating IPE. Moreover, they are unlikely to get involved in developing and sustaining these innovative programmes [87]. Since teachers must facilitate interprofessional groups of students who probably have different learning habits, they encountered several challenges when teaching IPE [80, 88, 89]. In faculty's view, several factors affect the implementation of IPE, such as their enthusiasm, economic issues,

cultural conditions, the education system, social conditions and professional jargon [80]. Moreover, due to workload and less positive perceptions of IPE, some faculty members may be resistant to curriculum changes that are needed to successfully incorporate IPE [36, 80].
Finally, students, too, may impede the success of IPE. The biggest barrier to IPE may be students' varying attitudes towards IPE (e.g. prejudices, stereotypes) [90]. Students with negative stereotypes of other professions can become a barrier to implementing IPE in training and practice [91, 92]. Moreover, some students may give IPE low priority as they do not regard it as important for them [79]. Students' clinical experiences in healthcare facilities may also influence their perceptions of IPE. This could happen when they learn from health professionals in health services who cannot become a role model promoting a culture of best interprofessional team collaboration in the workplace [93].
Although the discussion on the effect of IPE on interprofessional collaboration and healthcare professional performance in future practice continues, there is a growing consensus that IPE ideally should be incorporated throughout the whole health education curriculum [36]. This idea is supported by findings of studies reporting that students entering their individual healthcare programmes bring with them negative stereotypes of other health professions [92] and that by implementing IPE as part of healthcare professional education, curricula may help to develop positive perceptions of other professions [94].

## RATIONALE FOR STUDYING THE IMPLEMENTATION OF AN IPE PROGRAMME IN INDONESIA

Despite the introduction of IPE over three decades ago, the implementation of IPE in developing countries has been limited [85, 95]. It was not until 2014 that the Indonesian Ministry of National Education (MONE) officially introduced IPE and suggested to implement IPE in HPE [96]. Since 2019, the accreditation body has evaluated the implementation of IPE as part of institutional accreditation standards, making IPE a mandatory component of HPE. Developing an IPE programme suitable for the Indonesian HPE context not only requires attention to the local enablers of and barriers to IPE, such as a very strong culture of social hierarchy within Indonesian healthcare settings [21-23], but also a consideration of the variables involved in implementing a new curriculum in general, such as the programme design, stakeholders' perceptions and involvement, the institutional and societal context, and the education format [97].
Performing a needs assessment that considers students and teachers' attitudes towards and beliefs about IPE seems especially pertinent in the Indonesian setting given the existence of both profession-related and culturally ingrained 'biases' towards IPE. Successful implementation of IPE has been previously linked to participants' IPE beliefs [79, 80]. Anderson and colleagues (2009), amongst others, have specifically pointed to the key role of teachers within IPE [98]. Moving from a uni-professional to an inter-professional curriculum requires change, and facilitating IPE requires specific skills [88, 89].

## MAIN ARGUMENT AND RESEARCH AIM

The main aim of this PhD dissertation is to investigate and understand the aspects that should be considered when implementing interprofessional education in an Indonesian (Asian) context. This aim was translated into the following research questions:

1. What are students and teachers' perceptions of and readiness for interprofessional education in Indonesia?
2. To what extent can PBL be considered an education format that is suitable for interprofessional education in Indonesia and to what extent is PBL effective as an education format for interprofessional education?
3. To what extent can a community-based education programme be considered a suitable education format for interprofessional education in Indonesia and to what extent is community-based education effective as an education format for interprofessional education?

## OVERVIEW OF THE STUDIES AND RESEARCH QUESTIONS

To evaluate aspects that should be considered in implementing interprofessional education in an Indonesian (Asian) context and how IPE should be implemented, the research project focuses on the following two separate parts:

1. Students and teachers' perceptions of and attitude towards IPE; and
2. Teaching and learning approaches that suit the Indonesian context.

Chapters 2 and 3 first investigate students and teachers' perceptions of and attitude towards IPE. Subsequently, Chapters 4 to 6 examine the implementation of two different education formats for IPE: interprofessional PBL and community-based interprofessional education.

**Chapter 2** explores students' readiness for interprofessional education and their perceptions of IPE. Four research questions were addressed in the study: 1) Are students in an Asian context ready for IPE? 2) What are the most important factors influencing students' perceptions of IPE? 3) How do students explain their readiness for IPE? 4) Which factors do they describe that either mitigate or promote their sense of readiness for IPE? The Readiness for Interprofessional Learning Scale (RIPLS) [28] was applied to gather data of students' attitude towards IPE. In addition, focus-group discussion were used to collect data regarding student factors that might hinder and promote IPE.

**Chapter 3** evaluates teachers' attitude towards IPE. Faculty attitudes are reported to play an important role in the successful implementation of IPE initiatives within healthcare education settings. This study aimed to investigate: 1) healthcare faculty members' attitudes towards IPC and IPE; 2) the factors affecting faculty members' perceptions of IPC and IPE; and 3) healthcare professionals' perceptions of the factors that hamper the quality of IPC, and whether IPE is a potential remedy for the situation. A survey was administered to medicine, nursing, midwifery,

and dentistry faculty members at 17 institutions in Central Java Province, Indonesia. Respondents were asked to rate their attitudes towards IPC and IPE using a previously validated 'Attitude towards Interprofessional Health Care Collaboration and Education' scale [99]. To assist in interpreting the survey results, four uni-professional focus groups (FGs) were conducted and three key participants who could not be present at the FG meetings were interviewed.

**Chapter 4** focuses on evaluating the implementation of PBL as an education format for IPE. Previous research has suggested that Interprofessional PBL is one education format that provides students with the opportunity to develop the necessary skills to work collaboratively with various health professionals. Whether this also holds true for the Indonesian context, however, remains to be explored. Therefore, this study aimed to explore the extent to which students in interprofessional tutorial groups demonstrate constructive collaboration during group discussions. Fifty-two students from the Medical, Midwifery and Nursing programmes took part in the study. Students' constructive, collaborative activities were evaluated by tutors using the Maastricht-Peer Activity Rating Scale (M-PARS) [100]. To gain an understanding of students' perceptions of their performance and participation in the interprofessional PBL tutorial, three uni-professional focus groups were organised at the end of the pilot project.

**Chapter 5** focuses on evaluating the implementation of community-based interprofessional education as an education format for IPE. It has been reported that IPE formats situated in the classroom alone do not always seem to be sufficient to develop some skills needed for collaborative healthcare. Therefore, experiential IPE situated in practice-based settings such as the community is advocated. This chapter evaluates the design of a community-based interprofessional education programme implemented in Indonesia by exploring students' experience of and their teamwork skills during this programme. To identify students' perceptions of teamwork during community-based IPE, the Interprofessional Teamwork Evaluation Questionnaire [101] was administered to medical, nursing and midwifery students. Students' perceptions of the design of community-based IPE and underlying reasons for teamwork was evaluated through three uni-professional focus-group discussions (FGDs).

**Chapter 6** addresses students' participation and social interaction within community-based IPE. A total of 78 final pre-clinical year students from the Medical, Midwifery and Nursing programmes were randomly divided into 15 interprofessional groups. A community-based IPE programme employing surveys and discussion to solve community health problems was conducted. Students' discussion sessions were video-recorded and the conversations were transcribed verbatim. Content analysis based on the conversations during the discussions was applied to evaluate student participation and social interaction dimensions; those were: externalisation, elicitation, quick consensus building, integration oriented, conflict-oriented, and consensus building [102]. Statistical analysis was applied to evaluate the data.

**In Chapter 7**, we summarise and discuss the main findings of Chapters 2 to 6.

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CHAPTER 2

# UNDERSTANDING STUDENTS' READINESS FOR INTERPROFESSIONAL LEARNING IN AN ASIAN CONTEXT: A MIXED-METHODS STUDY

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## ABSTRACT

**Background**

Healthcare is generally provided by various health professionals acting together. Unfortunately, poor communication and collaboration within such healthcare teams often prevent its members from actively engaging in collaborative decision-making. Interprofessional education (IPE) which prepares health professionals for their collaborative role in the healthcare system may partially address this problem. This study aimed to investigate: 1) students' readiness for IPE in an Asian context, 2) the most important factors influencing students' perceptions of IPE, 3) the reasons underlying such perceptions, and 4) the factors mitigating or promoting their sense of readiness.

**Methods**

To identify students' perceptions of IPE, we administered the Readiness for Interprofessional Learning Scale (RIPLS) to 398 in approximately 470 students from a range of health professions (medicine, nursing, midwifery and dentistry). The questionnaire included factors that could potentially influence readiness for IPE as found in the literature (GPA, etc.). To enhance our understanding of the responses to the RIPLS and to explore the reasons underlying them, we conducted 4 mono-professional focus group discussions (FGDs). We ran a statistical analysis on the quantitative data, while performing a thematic content analysis of the qualitative data using ATLAS.ti (version 7).

**Results**

Medical students seemed to be the most prepared for IPE. Students' perceptions of IPE were conditioned by the study programme they took, their GPA, intrinsic motivation and engagement in the student council connoting experience of working with students from different programmes. Focus groups further revealed that: 1) early exposure to clinical practice triggered both positive and negative perceptions of IPE and of its importance to learning communication and leadership skills, 2) medical students caused insecurity and disengagement in other students, 3) medical students felt pressured to be leaders, and 4) there was a need to clarify and understand each other's profession and the boundaries of one's own profession.

**Conclusion**

Students were generally favourable to IPE, appreciating the opportunity it offered them to hone their interprofessional leadership, collaboration and communication skills and to learn to address the problem of role blurring. Hence, we judge the Asian context ready to implement IPE, allowing health professions students in Asian countries to reap its benefits. The present study revealed several important reasons underlying students' positive and negative perceptions of IPE implementation which may be addressed during the interprofessional learning process.

**Keywords**
Interprofessional education (IPE), Readiness for Interprofessional Learning Scale (RIPLS), Interprofessional collaboration, Role blurring

## BACKGROUND

The complex nature of today's healthcare, which not only aims to cure and prevent disease but also to promote health, requires effective collaboration between various healthcare professionals. However, interprofessional collaboration is not self-evident and is fraught with problems such as ineffective communication, poor interprofessional relationships, a lack of trust between team members, and an underestimation of other health professionals' roles[1]. These factors hinder the effective involvement of all team members in collaborative decision-making regarding patient care and the implementation of healthcare services.

To partially address this problem, the WHO has recommended the introduction of interprofessional education (IPE) which helps future healthcare professionals prepare for their collaborative role in the healthcare system. IPE offers students from different health professions the opportunity to learn with, from and about each other's profession and has been recognised as a means to safely promote and develop the collaboration skills students require in their later profession. Research has revealed that health professionals who were trained to collaborate as a team in an interprofessional educational setting during their student years were far more likely to be effective collaborators in their future professional clinical setting [2]. Although the implementation of IPE has been studied in a number of settings [3, 4] its implementation and application in the Asian region has received scant attention [5]. Like other peoples in the world, the Asian population is facing highly complex health problems that require interprofessional collaboration. In addition, the Asian region has a very strong culture of social hierarchy [6, 7], which translates into a large power distance between its people, also between doctors and nurses. Doctors are considered to hold the highest positions in society, whereas other health professionals such as nurses and midwives are marginalised. This situation further complicates effective interprofessional collaboration within healthcare teams and could potentially undermine successful implementation of IPE in higher education. Compounding matters in most Southeast Asian countries is that the boundaries between healthcare roles are frequently blurred and that the education system for healthcare professionals lacks standardisation [8]. From an educational management point of view, one could indeed anticipate that differences in timetables, in student numbers across the various health professions departments, in curricula and teaching approaches, and in assessment strategies pose a problem to effective IPE implementation [9, 10]. Even more challenging than this, however, are considered to be students' attitudes towards the new learning approach to be implemented, in this case IPE [11, 12]. It has also been demonstrated that students' attitudes towards and their perceptions of an educational approach are culture-bound [13].

Theoretically speaking, the hierarchical nature of Asian cultures clashes with the inherent IPE principle that all health professionals are equal. This may indicate that Asian students will be less favourable to IPE than, perhaps, students from certain Western cultures that are less hierarchical. Yet, to our knowledge, there have been few studies [5, 14, 15] that addressed students' attitudes towards IPE in an Asian context.

The present study therefore seeks to answer the following research questions:

1. Are students in an Asian context ready for IPE?
2. What are the most important factors influencing students' perceptions of IPE?
3. How do students explain their readiness for IPE?
4. Which factors do they describe that either mitigate or promote their sense of readiness for IPE?

## METHODS

### Context

In Indonesia all undergraduate health professions programmes have introduced interprofessional collaboration skills into their core curricula. However, very few of these universities have actually incorporated an IPE programme facilitating collaborative learning by multidisciplinary student teams into their curriculum. Universitas Islam Sultan Agung is one such university that has not yet implemented IPE, but it has the intention to develop an IPE curriculum for its medical, nursing, midwifery and dentistry programmes. For this purpose, we conducted a survey of students' perceptions of IPE. The named programmes differ in length and in the duration of their pre-clinical and clinical phases. While the medical, nursing and dentistry programmes all have 5-year curricula, the midwifery programme spans 3.5 years. Their clinical phases each start after 3.5, 4, 4 and 3 pre-clinical years, respectively. Only midwifery and nursing students have early clinical exposure in the 2nd and 3rd year, respectively, in the form of at least 2 months of practice in a hospital or public health centre. Medical and dentistry students do not gain any practical experience in their pre-clinical years other than practice in skill labs with simulated patients and manikins. Learning in all programmes is mono-professional, meaning that students rarely collaborate with students from other healthcare disciplines, not even during clinical rotations. For the present study we invited medical, nursing, midwifery and dentistry students who were in their final pre-clinical year to participate.

### Research Design

We selected an explanatory, sequential mixed-methods design to answer the research questions [16]. We first collected quantitative data by administering a previously validated Readiness for

Interprofessional Learning Scale (RIPLS) questionnaire to healthcare students. We specifically targeted students from the medical, nursing, midwifery and dentistry programmes who were in the final year of their preclinical programme. The results of the questionnaire were then used as input for the qualitative data collection consisting of mono-professional focus group discussions aimed to understand the underlying reasons for students' perceptions of IPE.

## Quantitative Data Collection: RIPLS Questionnaires

To determine readiness for IPE, Parsell and Bligh [11] developed the three-dimensional Readiness of healthcare students for Interprofessional Learning Scale (RIPLS) questionnaire, consisting of 19 items. This instrument explores attitudinal factors that are important to consider when designing IPE, such as respect for one's own and other's professional identity, knowledge and roles. The first dimension explores whether the learner recognises the benefit of teamwork and collaboration, as well as of content and methods that teach them to work interprofessionally. The second dimension investigates positive and negative aspects of professional identity, whereas the third dimension explores perceptions of health professions' roles and responsibilities. The instrument has a 5-point Likert scale ranging from one (strongly disagree) to five (strongly agree) with some reverse-scored items. High scores on the RIPLS indicate good readiness for interprofessional learning. The RIPLS questionnaire was translated by means of a double back translation procedure to assess the consistency between original and translated version of RIPLS. This means that an English-Indonesian translator first translated the English version of the questionnaire into Bahasa Indonesia, after which another translator translated this translation back into English. We also added a set of questions referring to factors that we knew from the literature had the potential to influence readiness for IPE. We also added a set of questions referring to factors that we knew from the literature had the potential to influence readiness for IPE. These factors were : a) study programme [17], b) respondents' GPA [18], c) past experience of working with students from other study programmes in student associations [19], and d) motivation to study in a health professions programme [20]. Two members of the research team collected the questionnaires after lectures. Before students completed the questionnaires, the researchers explained to them what the study sought to accomplish, what type of information the questionnaires would provide, that their participation was entirely voluntary, and that their answers to the questionnaires would not affect the grades in any courses they were taking.

## Qualitative Data Collection: Focus Group Discussions

To gain a better understanding of the answers provided in the questionnaires, we organised four uni-professional focus groups (FGs). We deliberately chose not to mix students from different

programmes to overcome potential barriers to communication and to encourage participants in the discussion. FG participants were randomly selected on the basis of their RIPL scores: each group included about four to five students who were favourable to IPE and four to five students who were less favourable to the concept. If a student did not wish to participate, we invited a different student with similar IPE scores. All FGs were video recorded. A lecturer in community medicine (SY) who understood the concept and aims of the study facilitated the FGs with the aid of a discussion guide [21]. This guide contained the following questions for students, depending on the case: (a) why they were or were not favourable to IPE, (b) why their scores for certain items on the questionnaire were low/high, (c) whether they agreed with the plan to implement IPE in their school, and why, and (d) whether they had any suggestions for successful implementation of IPE.

## ANALYSIS

### Questionnaire

At the time of the study, the Indonesian translation of the RIPLS questionnaire had not been validated. We performed a factor analysis to explore its construct validity and computed Cronbach's alpha to determine internal consistency. The suitability of the correlation matrix was determined by the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The numbers of factors retained for the initial solutions and entered into the rotation were determined with the application of Kaiser's criterion (eigenvalues > 1). The initial factor extraction was performed using principal component analysis. Finally, we performed an exploratory factor analysis using promax rotation to define the clearer structure (see appendix 1). The KMO index was 0.928, indicating sampling adequacy, while the Bartlett sphericity chi-square index was 5388.09, with $p<0.001$ indicating that null hypothesis that the correlation matrix was an identity matrix and therefore unsuitable for factor analysis was rejected. Exploratory factor analysis (see appendix 2) yielded the subscales 'teamwork and collaboration', 'professional identity and role understanding', and a third subscale consisting of one item only (Q19), which read: 'I have to acquire much more knowledge and skills than other students/professionals in my own faculty/organisation'. Because Cronbach's alpha cannot be determined for a one-item scale, we excluded this question from the questionnaire, so only the first two subscales remained. A plausible explanation for the low loadings on this particular item may be that it may have been interpreted to mean self-efficacy and may have inadvertently connoted a sense of superiority to others. This is contrary to Indonesian values, which stress equanimity or composure [22]. The validity test revealed that the two subscales 'teamwork and collaboration' and 'professional identity and role understanding' had Cronbach alphas of 0.944 and 0.92, respectively.

Based on the valid RIPLS, we consequently performed a Kruskal-Wallis non-parametric test to evaluate differences in RIPLS scores between the four study groups and, since scores were not

normally distributed ($p<0.05$ for all subscales), carried out a Mann-Whitney U test to analyse differences within pairs of study groups using SPSS (version 16.0). We obtained the $\alpha$ level of significance by using Bonferroni correction resulting in an adjusted $\alpha$ level of 0.008 (0.05/6).

### Focus Groups

All FGDs were transcribed verbatim by two medical education experts, the results of which were summarised and sent to participants as part of a member check procedure [21]. The verbatim transcripts were made in Indonesian and coded for content, without eroding their original substance. Two medical education experts, EL and DAR, who were also native Indonesian speakers, performed the analysis. The two independently evaluated the transcripts, first by open coding, then they developed the coding categories, which they finally applied to the data. Both agreed to group students' perceptions into subthemes of positive and negative perceptions of IPE, before starting to look for overarching themes. After this process, all members of the research team discussed findings until they reached consensus. For the thematic content analysis [21] we used qualitative data analysis and research software ATLAS.ti (version 7).

## RESULTS

### Quantitative Results: RIPLS

During the day of the study, 428 in a total of 470 students (240 medical, 120 nursing, 60 midwifery and 50 dentistry students) attended class and filled in the questionnaire. Thirty students failed to complete all parts of the questionnaire and were therefore excluded. Hence, we derived our data from a pool of 398 subjects denoting a response rate of 84.7 %. Two hundred and sixty-six female students (67 %) participated in the study, which is twice as many as their male counterparts. For 286 (71.9 %) of all respondents, the decision to apply to a health professions programme was based on personal motivation, while a mere 19.3 % had already worked with students from other study programmes in the student council. These and other demographic data are presented in Table 1.

**Table 1.** Demographics characteristics of respondents

| | Midwifery | | Nurse | | Dentistry | | Medical | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Gender | | | | | | | | |
| Male | 0 | 0 | 41 | 41.4 | 11 | 25 | 80 | 38.1 |
| Female | 47 | 100 | 58 | 58.6 | 33 | 75 | 128 | 61.5 |
| Admission | | | | | | | | |
| invitation | 0 | | 2 | 2 | 4 | 9.1 | 68 | 32.7 |
| regular test | 46 | 97.9 | 73 | 73.7 | 25 | 56.8 | 116 | 55.8 |
| scholarship | 1 | 2.1 | 24 | 24.2 | 15 | 34.1 | 24 | 11.5 |
| decision to study at the programme | | | | | | | | |
| own preference | 23 | 48.9 | 51 | 51.5 | 32 | 72.7 | 180 | 86.5 |
| encouraged by parents | 24 | 51.1 | 48 | 48.5 | 12 | 27.3 | 28 | 13.5 |
| experiencing of working with students from different programmes | | | | | | | | |
| yes | 5 | 10.6 | 15 | 15.2 | 5 | 11.4 | 52 | 25 |
| no | 42 | 89.4 | 84 | 84.8 | 39 | 88.6 | 156 | 75 |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Age | 20.17 | 0.73 | 20.14 | 0.7 | 19.86 | 1.11 | 20.07 | 0.73 |
| GPA (max score 4) | 3.03 | 0.36 | 2.85 | 0.32 | 3.1 | 0.26 | 2.96 | 0.5 |

The study programme chosen, GPA, motivation to apply to a health professions programme and experience of working with students from other study programmes in a student council were factors that significantly influenced the total RIPLS score, with p-values of 0.000, 0.003, 0.000 and 0.008, respectively (see Table 2).

**Table 2.** Mean of each subscale based on some factors

| | Teamwork and collaboration | | Professional identity and role understanding | | Total RIPLS score | |
|---|---|---|---|---|---|---|
| | Mean | p | Mean | p | Mean | p |
| Gender | | | | | | |
| Male | 55.35 ± 7.2 | 0.648 | 15.58 ± 5.5 | 0.908 | 70.92±9.24 | 0.683 |
| Female | 55.64 ± 6.8 | | 15.43±5.8 | | 71.08±9.8 | |
| Age | | | | | | |
| <21 year | 55.43±7.2 | 0.930 | 15.60±5.8 | 0.700 | 71.03 ± 9.8 | 0.891 |
| 21-24 year | 56.04±5.93 | | 14.97±5.3 | | 71.01 ± 9.17 | |
| >24 year | 55.5±4.94 | | 15.5±6.4 | | 71.00± 1.4 | |
| Programme | | | | | | |
| Midwifery | 54.4 ±4.1 | | 10.9 ± 2.2 | | 65.3 ±3,7 | |
| Nursing | 54.7 ± 6.2 | 0.015* | 9.9 ± 3.2 | 0.000* | 64.7 ±5,4 | 0.000* |
| Dentistry | 54.9 ±4.5 | | 13.1 ± 3.1 | | 68.1 ±5,2 | |
| Medicine | 56 ± 8.1 | | 19.6 ± 4.1 | | 76 ± 10 | |
| GPA (range 0-4) | | | | | | |
| <2.75 | 53.7 ± 5.5 | | 15.2 ± 5.2 | | 68.8 ± 8.3 | |
| 2.75 – 3 | 55.7 ± 6.2 | 0.003* | 14.6 ± 5.4 | 0.086 | 70.3 ± 8.6 | 0.003* |
| >3 | 56.5 ± 7.8 | | 16.1 ± 6.0 | | 72.6 ± 10.1 | |
| Motivation to study in health professions programme | | | | | | |
| Own preference | 56.1 ± 7.4 | | 16.5 ± 5.9 | | 72.6 ± 10.1 | |
| Encouraged by parents | 53.9 ± 5.3 | 0.000† | 13.0 ± 4.3 | 0.086 | 66.9 ± 5.8 | 0.000† |
| Working with students from other departments in student council | | | | | | |
| Yes | 57.3 ± 7.1 | 0.008† | 16.5 ± 6.0 | 0.086 | 73.7 ± 10.0 | 0.008† |
| No | 55.1 ± 6.9 | | 15.2 ± 5.6 | | 70.3 ± 9.4 | |

Statistically significant based on the Kruskal-Wallis test.

† Statistically significant based on the Mann-Whitney U test

The Kruskal-Wallis statistical analysis revealed that the mean RIPLS scores differed significantly between study groups. The Mann-Whitney U statistical analysis was performed to determine significant mean differences within pairs of study groups (Table 3). The largest differences between study groups, midwifery vs nursing excepted were found in the subscale 'professional identity and role understanding' (p=0.000). Total mean scores also differed significantly between groups (p=0.000), which, however, did not also hold for the midwifery-nursing and midwifery-dentistry pairs (Table 3).

**Table 3.** Mean differences in subscales and total RIPLS scores between study groups

| Study programme | Teamwork and collaboration | | Professional identity and role understanding | | Total RIPLS score | |
|---|---|---|---|---|---|---|
| | mean | p | mean | p | mean | p |
| Midwifery vs Nursing | 54.4 vs 54.7 | 0.997 | 10.9 vs 9.9 | 0.035 | 65.3 vs 64.7 | 0.349 |
| Midwifery vs Dentistry | 54.4 vs 54.9 | 0.867 | 10.9 vs 13.1 | 0.000‡ | 65.3 vs 68.1 | 0.008 |
| Midwifery vs Medicine | 54.4 vs 56 | 0.037 | 10.9 vs 19.6 | 0.000‡ | 65.3 vs 76 | 0.000‡ |
| Nursing vs Dentistry | 54.7 vs 54.9 | 0.792 | 9.9 vs 13.1 | 0.000‡ | 64.7 vs 68.1 | 0.001‡ |
| Nursing vs Medicine | 54.7 vs 56 | 0.008 | 9.9 vs 19.6 | 0.000‡ | 64.7 vs 76 | 0.000‡ |
| Dentistry vs Medicine | S4.9 vs 59 | 0.057 | 13.1 vs 19.6 | 0.000‡ | 68.1 vs 76 | 0.000‡ |

‡ Statistically significant based on the Mann-Whitney U test with Bonferroni correction (p<0.008)

**Qualitative Results: Focus Groups**

To allow for a better interpretation of the RIPLS results, we discussed them during uni-professional focus groups. The characteristics of FG subjects were presented in table 4. Four main themes identified, specifically: 1) Early exposure to clinical practice triggered both positive and negative perceptions of IPE and of its importance to learning communication and leadership skills, 2) Medical students caused insecurity and disengagement in other students, 3) Medical students felt pressured to be leaders, and 4) There was a need to clarify and understand each other's profession and the boundaries of one's own profession.

**Table 4.** Characteristics of FG participants

| | Midwifery | | Nurse | | Dentistry | | Medical | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Gender | | | | | | | | |
| Male | 0 | 0 | 8 | 88.9 | 4 | 44.4 | 8 | 80 |
| Female | 10 | 100 | 1 | 11.1 | 5 | 55.6 | 2 | 20 |
| Admission | | | | | | | | |
| invitation | 1 | 10 | 1 | 11.1 | 3 | 33.3 | 1 | 10 |
| regular test | 9 | 90 | 8 | 88.9 | 5 | 55.6 | 8 | 50 |
| scholarship | 0 | 0 | 0 | 0 | 1 | 11.1 | 1 | 10 |
| decision to study at the programme | | | | | | | | |
| own preference | 6 | 60 | 5 | 55.6 | 5 | 55.6 | 3 | 30 |
| encouraged by parents | 4 | 40 | 4 | 44.4 | 4 | 44.4 | 7 | 70 |
| experiencing of working with students from different programmes | | | | | | | | |
| yes | 3 | 30 | 2 | 22.2 | 4 | 44.4 | 5 | 50 |
| no | 7 | 70 | 7 | 88.8 | 5 | 55.6 | 5 | 50 |
| | 42 | 89.4 | 84 | 84.8 | 39 | 88.6 | 156 | 75 |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Age | 19.8 | 0.63 | 20.2 | 0.66 | 20.5 | 2.18 | 19.8 | 0.42 |
| GPA (max score 4) | 3.14 | 0.39 | 2.98 | 0.26 | 3.27 | 0.27 | 2.98 | 0.48 |

## 1. Early exposure to clinical practice triggered both positive and negative perceptions of IPE and of its importance to learning communication and leadership skills

Students who favoured IPE reasoned that IPE would improve their communication skills. They believed that communication skills training during IPE would teach them to become effective communicators and improve their leadership skills:

> *In my opinion, IPE allows us to practise our communication skills with other health professions students, so that we can identify and tackle any undesired attitudes when communicating and distributing tasks. Moreover, we doctors will be health team leaders and managers in the future; therefore we definitely have to be able to communicate well. (Medical student)*

Several nursing and midwifery students, on the other hand, indicated to have experienced unpleasant situations with medical students during early practice in hospital, causing them to be unfavourably disposed towards IPE. They explained that during clinical practice, medical students did not want to interact with them, behaved arrogantly and did not care about other health professions students. Since they felt harmonious communication between medical and nursing students in the wards was lacking, they argued that communication skills would best be taught in uni-professional courses rather than in interprofessional settings:

> *At the hospital we often work uni-, rather than interprofessionally. Although we care for patients in the same ward, we never interact. We usually learn from the patient record what medical students did to the patient and what their instructions are to us; there is no face-to-face communication at all. So, we communicate via the medical record. Well, with this kind of attitude IPE will be difficult to implement (Nursing student)*

Nursing and midwifery students observed similar attitudes and significantly hierarchical behaviour among the various workers in healthcare teams during their experience in the wards:

> *Once, during my internship at a hospital, I watched the nurse in charge being scolded by a specialist. The doctor was furious! The reason was basically that the nurse had not communicated a simple thing to him. We ventured to ask the nurse what it was that caused the communication problem. She explained that communicating with doctors can be difficult at times: sometimes they do not want to take phone calls, they only accept SMS, while on other days they expect the opposite. Anything would be wrong ... Well, not all doctors are like this, but the phenomenon really makes us doubt whether IPE can be successful, as many doctors treat nurses unequally. The same could happen to students, right? (Nursing student)*

## 2. Medical students caused insecurity and disengagement in other students

Dentistry, midwifery and nursing students had lower scores on the 'professional identity and role understanding' subscale of the RIPLS than medical students. The FG revealed that dentistry, midwifery and nursing students believed that mingling with students from other programmes would benefit them, although they imagined it to be difficult because medical students made them feel insecure. The widely held belief that doctors rank higher in status compared to other health professionals, together with their negative perceptions of medical students' attitudes, caused anxiety among some nursing and midwifery students, which dented their confidence in the gains of IPE and hence mitigated their enthusiasm for IPE implementation:

*We are not as smart as medical students. Society assumes that our job is not as difficult as that of doctors, and it also puts us in position which is inferior to theirs. Medical students might consider us as their assistants. Those things are bothering me. I'm not sure if we will be able to share knowledge and views in IPE. (Midwifery student)*

### 3. Medical students felt pressured to be leaders

Some medical students expressed that they were actually not too confident about studying together with students from other health programmes. They argued that IPE would better fit the clinical phase, because by then they would have sufficient medical knowledge to be able to explain their field to students from other disciplines within the IPE programme. They did not feel ready for IPE in the current pre-clinical phase, because in their view they still made too many mistakes. Such perceptions indicated that medical students felt pressured to lead and to have all the right answers, even though they were still in their pre-clinical years. As a result, some of them did not support the idea to introduce IPE:

*I don't mean that I am against IPE, but my experience during small group discussions with fellow medical students is that sometimes we give wrong explanations with the discussion ending in deadlock because none of us know how to explain things. What will happen if students from other professions keep asking us questions which we cannot answer or to which we provide the wrong answers? The information we provide might even be misleading because our medical knowledge is not yet complete. So, I think it would be better if IPE were offered in the clinical programme. (Medical student)*

*I know that normally they [other health professionals] know what they have to do. But what if they have to give an injection to a patient and they ask me how many cc of the medicine is required, and I do not know either? What do you think will happen? It would be a shameful situation. (Medical student)*

## Students felt the need to clarify and understand each other's profession and the boundaries of one's own profession

Students from all programmes concurred that IPE would encourage them to better understand each other's professional roles and responsibilities as well as the boundaries of their own roles. This became their main reason to support IPE. Students who favoured IPE also believed that IPE would improve their knowledge about medicine and clinical skills. They understood that they, as future health professionals, had professional limitations, and that, therefore, learning collaboratively with students from other health programmes would extend their knowledge and skills:

> *In a variety of cases, doctors, dentists, medical specialists and nurses alike will need to collaborate. In certain dental emergency cases, for instance, we will sometimes need to refer the patient to an internal medicine specialist... so if we are offered a module that requires us to cooperate and which is meant to teach us to cooperate with other [professionals], then I am in, as it will make us better practitioners in the future. (Dentistry student)*

> *IIPE affords us the opportunity to discuss the role of each professional. So, obviously, there will no longer be conflicts regarding roles. All health workers have nearly equal basic clinical skills. For example, both doctors and nurses can perform an infusion, give immunisation injections and so forth. However, when working together as a team it should be clear what the duties of the doctor are and what things should be done by the nurse. That can be discussed in the classroom or even before the simulation, so that we know the boundaries of each profession's roles. (Medical student)*

A main topic arising from the FGs was the need to discuss role distribution during IPE, as unclear role boundaries were perceived to be the main source of interpersonal problems among healthcare professionals. Especially midwifery and nursing students mentioned the problem of role ambiguity (role blurring), even though some did not believe IPE could effectively address this. Nursing students, for instance, complained about role blurring in community healthcare settings, as they were sometimes forced by the community to perform medical treatments when there were no doctors available. Such activities are actually considered a violation of the law and have a negative bearing on the medical profession. Nursing students, moreover, expressed concerns that this role ambiguity in community practice would disturb IPE processes:

> *We know that many doctors complain about their patients in the community being taken over by nurses. Frankly, our role in community health services is becoming blurred, because in Indonesia community nursing care is not a very popular service. As nurses can perform a number of medical treatments, it is not uncommon for them to also provide medical services. In the community, moreover, people sometimes trust a nurse more than a doctor. We are aware that it makes doctors unhappy. We fear that experiences like these will cause problems during IPE. (Nursing student)*

Likewise, some medical students voiced concerns that the fact that nurses and midwives are able to administer certain medical treatments in the community would threaten their 'cognitive exclusivity'. More specifically, they feared that other health professions students would learn to do what was supposed to be their sole scope of practice. As a result, some of them were opposed to the IPE concept:

*I fear that, by having discussions and sharing knowledge with other professionals, students from professions other than medical, particularly nursing students, will learn more about how to handle patients, what to ask in history taking sessions and what treatment should be given. What I expect next is that, like usual, they will do it [the medical practice] themselves in their private practice in the future, although we know that they should not. I don't want my 'land' [source of income] to be taken by other professions just because of IPE. (Medical student)*

## DISCUSSION

The present study has sought to answer the questions as to whether students in an Asian context are ready for IPE, what are the most important factors influencing students' readiness for IPE, how students explain their readiness for IPE, and which factors either mitigate or promote this sense of readiness. To answer the first, second, and fourth question, we had the original RIPLS by Parsell and Bligh translated into Indonesian and adapted it to the Indonesian context. The translated version proved valid and reliable after an exploratory factor analysis resulting in 18 items distributed between two subscales which were renamed 'teamwork and collaboration' and 'professional identity and role understanding'. The validated version differed from the original one in that the latter contained three subscales, specifically 'teamwork and collaboration', 'professional identity' and 'roles and responsibilities'. Other studies that explored RIPLS' validity and reliability also dismissed the third subscale [23, 24]. A recently published Indonesian version of the RIPLS reported that items 18 and 19 had low loadings, suggesting that both items did not fit the Indonesian context well [22]. The weakness of the roles and responsibilities subscale in an undergraduate setting was tentatively ascribed to respondents' lack of professional experience [23]. This may also explain our present case, as nursing and midwifery students did have some experience of fieldwork in hospitals and public health centres, but medical and dentistry students had none. This lack of experience possibly influenced their perceptions of clear roles. Another translation of RIPLS in an Asian context with a factor solution that differed from the original version [11] was reported by Hayashi et al. [15] and exhibited high internal consistency ($\alpha = 0.87$). Yet another un-adapted Japanese version reported by Tamura et al. [25], in contrast, presented good Cronbach's alphas for all three subscales. Medical students' mean scores for the RIPLS questionnaire were higher than those of students from other programmes, suggesting that they were more ready for IPE compared to the other three groups. At the same time, one could infer that the fact that medical students had not previously been exposed to clinical practice allowed them to remain idealistic. Contrary to our finding, other studies have found that the mean RIPLS scores of medical students were actually lower than those of students from other health professions programmes [26, 27]. Additionally, nursing students have been reported to be more receptive to the idea of collaborating with other health professionals compared to medical students [12].

We also found that the RIPLS score seemed to correlate with the study programme chosen, which was especially true for the 'professional identity and role understanding' subscale. This finding appears to confirm previous research which has suggested that students' attitudes towards IPE differ according to their professional background [28]. Similarly, we found a correlation between students' GPA and their perceptions of IPE. Again, this finding is consistent with previous research demonstrating that students with a high cognitive capacity seem to be more ready to learn with students from other disciplines in IPE [18]. Intrinsic motivation to study in a health professions programme was also found to affect students' perceptions of teamwork and collaboration with other health professionals, as well as of interprofessional education.

Students who had already collaborated with colleagues from other departments in the student council had a more positive attitude towards teamwork and collaboration, as well as towards interprofessional education in general. Such opportunities to interact and learn together with other professionals nurture the development of communication skills [19], leadership skills and collaborative skills [29]. Hence, involvement in multi-professional student activities will increase students' readiness for IPE.

To complement findings from the RIPLS questionnaire and to specifically address the third research question of how students explain their readiness for IPE, we conducted four FGDs. From these discussions it resulted that medical students' good performance on the RIPLS questionnaire was not reflected in feedback received from nursing and midwifery students, who had already been exposed to collaborative clinical care. Instead, they reported that communication with medical students during their clinical exposure was minimal. In their perception, medical students were unwilling to communicate, behaved arrogantly and held stereotyped views, attributes which inhibit the implementation of IPE [9, 30]. In addition, clinical education was organised by each health professions programme separately, with distinct learning schedules, activities and assessment procedures, and organisers did not communicate with each other. As a result, students rarely interacted with students from other programmes, not even when treating a patient together. The fact that several students had been active in the student council did not play a role in this, as the context is entirely different.

Although some students believed that IPE would improve the quality of collaboration within a team of health professionals, early exposure to professional practice could also cause students to have negative perceptions of the healthcare team as well as of IPE. Nursing and midwifery students, for instance, had experienced that interactions within healthcare teams in hospitals were not always harmonious, which, in turn, seemed to kindle negative perceptions of collaborative interprofessional healthcare teams, as well as of other health professionals. Since medical and dentistry students had not had any practical experience in hospitals, they may have held idealistic views about improving communication and leadership skills through an IPE programme. It has been reported in the literature that students generally learn their discipline's attitudes, norms, values and practices through tacit observation of staff behaviours [31, 32]. When what they see and learn in real practice are discipline-bound stereotypes and

communication problems, this might seriously interfere with the development of collaborative practice. Consequently, students may develop negative opinions about interprofessional interaction [33] and negative perceptions of the importance of IPE. In a similar vein, Makino et al. [14] examined the relationship between exposure to clinical practice and attitudes towards interprofessional healthcare teams using the modified Attitudes towards Healthcare Teams Scale (ATHCTS). He found that alumni had significantly lower overall mean scores than undergraduate students, inferring that exposure to clinical practice may detract from the positive attitude students have towards the efficacy of healthcare teams. Underlying issues reported as barriers to collaboration were the fact that fresh graduates were often ill-prepared to apply their knowledge to real-world problems [34] and to cope with the competitive spirit dominating the workplace [35], which in turn engendered negative attitudes towards interprofessional care and learning. This may also explain why the midwifery and nursing students of our study who had already been exposed to clinical practice were less favourable to IPE compared to the medical and dentistry students who had no prior clinical experience. This finding reinforces how students learn from role modelling [36], making it imperative that healthcare team interactions in all healthcare settings be improved. We need to find well-functioning healthcare teams that can serve as role models for students so that they can learn how to effectively communicate with other health professionals during patient care.

Another finding identified from the FGDs is that medical students caused insecurity and disengagement in other students indicating that deeply ingrained societal views permeate students' perceptions of IPE. The view that other health professionals would be inferior to doctors caused nursing and midwifery students to be insecure about IPE. They felt that they ranked lower in academic status and that their intended profession was less 'prestigious' than medicine. It has indeed been reported that nursing students were perceived inferior to medical students with respect to several characteristics, including status in society, competence and academic ability [37]. As a result, students developed stereotypical notions of how other health professions students would behave towards them during interprofessional learning [38], which ideas, in turn, dented their confidence about learning collaboratively with medical students in IPE. A number of medical students also exhibited little confidence in their own performance, knowledge and capacity to be leaders of healthcare teams. When it comes to leadership skills, we have learned from the literature that, although students perceive themselves as competent communicators, they also consider themselves less effective care managers [39]. For this reason, efforts to implement IPE have specifically aimed at the incorporation of experiential leadership training [40].

Students appreciated the fact that unclear boundaries between health professionals' roles complicate interprofessional collaboration in Indonesia, making it an important issue to address during IPE. However, unclear role boundaries and role blurring were additional reasons for some students to have negative perceptions of IPE. This effect has been reported elsewhere in the literature and is considered to be a problem among healthcare professionals [41]. Medical

students, for instance, opposed the concept of IPE since they did not want to share knowledge with other health professionals. With this attitude students sought to defend their 'cognitive exclusivity' against current healthcare practices in Indonesia which allow nurses to offer private medical services, providing therapeutic treatment to patients, prescribing medicines, and other tasks that actually pertain to the doctor's scope of practice. Sometimes, this is partially the result of doctors transferring their practices to the larger towns, leaving the care of patients in villages to nurses. Additionally, it is not uncommon for nurses to deliver medical services at a lower rate to people in the lower echelons, so that those who suffer most from disease are often treated by nurses rather than doctors [42]. Such role conflicts among health professionals, especially between nurses and doctors, are commonplace in healthcare services [43]. This issue is particularly sensitive in Indonesia and perhaps in other Asian countries with similar backgrounds and caused students to be reluctant to share knowledge within IPE.

This research contributes to literature as, to the best of our knowledge, it was the only study that examined students' perception toward interprofessional education applying mixed method design, which allows it to explore comprehensive information of students' perception. Other studies on the same theme generally applied quantitative design. However, there is limitation of this study that the students in each group were not equal in number, which likely to cause bias. To minimise the bias, data were taken from entire accessible population and the statistical calculation of quantitative data were based on average values. In addition, data were collected from schools of health profession of a university in Indonesia, which might not represent all Indonesian students. The findings might be difficult to generalise as the data were taken from one institution only. Similar study could be conducted with broader population.

## CONCLUSION

Medical students' mean scores for the RIPLS questionnaire were higher than those of students from other programmes. The study programme chosen, GPA, intrinsic motivation and experience of working with students from other study programmes in a student council were factors that influenced perceptions of IPE. Some themes that identified during the focus groups were: early exposure to clinical practice triggered both positive and negative perceptions of IPE and of its importance to learning communication and leadership skills; medical students caused insecurity and disengagement in other students; medical students felt pressured to be leaders; and there was a need to clarify and understand each other's profession and the boundaries of one's own profession. In order for IPE to be successful in the Asian context and culture, heed should be paid to the blurring of roles and role boundaries. We need strong role models from the various health professions to help create and implement successful IPE programmes and ultimately improve interprofessional collaboration in the Indonesian healthcare system.

## Ethics Approval and consent to participate

The study was approved by the Bioethics Committee for Medical/ Health Research Faculty of Medicine Islamic University of Sultan Agung Semarang (Letter No. 290/XII/2013/Komisi Bioetik) and was conducted at Sultan Agung Islamic University, Semarang, Indonesia. Taking part in the study posed no physical risks to participants. A covering letter explaining the study's goal, procedures and confidentiality accompanied the Readiness for Interprofessional Learning Scale (RIPLS) questionnaires. We explained to all students that participation was voluntary and that refusal to join the study would have no consequences. Consent was implied by the fact that respondents completed the questionnaire voluntarily. To ensure confidentiality we anonymised both the RIPLS questionnaires and the transcripts of the focus group interviews.

## Availability of supporting data and materials

Materials and supporting data are available for download on the website: https://drive.google.com/folderview?id=0B_CPaqF-zFD3VHNRVlI1QVpPRDA&usp=sharing. All files may be used for research and education without further consent.

## Abbreviations:

ATHCTS = Attitudes Towards Healthcare Teams Scale; FG = Focus Group; FGD = Focus Group Discussion; GPA = Grade Point Average; IPE = Interprofessional education; KMO = Kaiser-Meyer-Olkin; RIPLS = Readiness for Interprofessional Learning Scale.

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## APPENDIX 1: RIPLS VALIDATION

KMO and Bartlett's Test

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | ,928 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 5388,094 |
| | df | 171 |
| | Sig. | ,000 |

KMO > 0.5 indicates that the results of factorial analysis can be applied.

Total Variance Explained

| | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation |
|---|---|---|---|---|---|---|---|
| Component | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total |
| 1 | 8,002 | 42,115 | 42,115 | 8,002 | 42,115 | 42,115 | 7,934 |
| 2 | 3,693 | 19,437 | 61,552 | 3,693 | 19,437 | 61,552 | 4,007 |
| 3 | 1,036 | 5,452 | 67,004 | 1,036 | 5,452 | 67,004 | 1,306 |
| 4 | ,881 | 4,636 | 71,640 | | | | |
| 5 | ,726 | 3,822 | 75,462 | | | | |
| 6 | ,570 | 2,998 | 78,460 | | | | |
| 7 | ,498 | 2,621 | 81,081 | | | | |
| 8 | ,457 | 2,407 | 83,488 | | | | |
| 9 | ,450 | 2,370 | 85,858 | | | | |
| 10 | ,405 | 2,132 | 87,990 | | | | |
| 11 | ,363 | 1,910 | 89,900 | | | | |
| 12 | ,345 | 1,818 | 91,718 | | | | |
| 13 | ,298 | 1,567 | 93,285 | | | | |
| 14 | ,286 | 1,503 | 94,788 | | | | |
| 15 | ,249 | 1,310 | 96,098 | | | | |
| 16 | ,236 | 1,243 | 97,341 | | | | |
| 17 | ,225 | 1,187 | 98,527 | | | | |
| 18 | ,206 | 1,085 | 99,612 | | | | |
| 19 | ,074 | ,388 | 100,000 | | | | |

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

## APPENDIX 2: CONTRIBUTION OF COMPONENTS TO EACH SUBSCALE

| No | Statements | teamwork and collaboration | Professional identity and role understanding |
|---|---|---|---|
| 1 | Learning with other students will help me become a more effective member of a healthcare team. | 0.767 | |
| 2 | Patients would ultimately benefit if healthcare students worked together to solve patient problems. | 0.805 | |
| 3 | Shared learning with other healthcare students will increase my ability to understand clinical problems | 0.830 | |
| 4 | Learning with heath care students before qualification would improve relationships after qualification | 0.799 | |
| 5 | Communication skill should be learnt with other healthcare students | 0.796 | |
| 6 | Shared learning will help me to think positively about other healthcare students | 0.853 | |
| 7 | For small group learning to work, students need to trust and respect each other | 0.767 | |
| 8 | Team-working skills are essential for all healthcare students to learn | 0.772 | |
| 9 | Shared learning will help me to understand my own limitations | 0.801 | |
| 10 | I don't want to waste my time learning with other healthcare students [a] | | 0.919 |
| 11 | It is not necessary for undergraduate healthcare students to learn together [a] | | 0.922 |
| 12 | Clinical problem-solving skills can only be learnt with students from my own department [a] | | 0.876 |
| 13 | Shared learning with other healthcare students will help me to communicate better with patients and other professionals | 0.692 | |
| 14 | I would welcome the opportunity to work on small group projects with other healthcare students | 0.741 | |
| 15 | Shared learning will help me to clarify the nature of patient problems | 0.765 | |
| 16 | Shared learning before qualification will help me become a better team worker | 0.688 | |
| 17 | The purpose of nurses and therapists is mainly to provide support for doctors | | 0.678 |
| 18 | I'm not sure what my professional role will be | | 0.825 |

We used Parsell and Bligh's RIPLS (1999) as instrument; negatively worded items were reverse-scored.

CHAPTER 3

# UNDERSTANDING ATTITUDE OF HEALTHCARE PROFESSIONAL TEACHERS TOWARD INTERPROFESSIONAL HEALTHCARE COLLABORATION AND EDUCATION IN AN ASIAN COUNTRY

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## ABSTRACT

**Background**

Faculty members play crucial roles as facilitators of learning for effective interprofessional education (IPE). However, faculty attitudes are reported to be barriers to successful implementation of IPE initiatives within health care education settings. This study aimed to investigate: (1) health care faculty members' attitudes toward interprofessional collaboration (IPC) and IPE; (2) factors affecting faculty members' perception towards IPC and IPE; and (3) health care professionals' perceptions toward factors that hamper the quality of IPC, and whether IPE is a possible remedy for the situation.

**Methods**

A survey was administered to medicine, nursing, midwifery and dentistry faculty members at 17 health professional education institutions in Central Java Province, Indonesia. Respondents were asked to rate their attitudes towards IPC dan IPE using a previously validated "Attitude toward Interprofessional Healthcare Collaboration and Education" scale. To help interpretation of the survey results, 4 uni-professional focus groups were conducted and 3 key participants who could not be present at the focus group meetings were interviewed. We conducted a statistical analysis on the quantitative data, and performed a thematic content analysis of the qualitative data using ATLAS Ti (version 7).

**Results**

The total response rate was 74.1%. Nurses' mean scores for attitudes toward IPC and IPE were higher than those of other health care professionals. The main problems of IPC identified from the focus group (FG) were as follows: (1) differing perceptions of the needs of patients among professionals; (2) unequal participation in decision making; (3) lack of face-to-face interaction; and (4) overlapping of roles and responsibilities. Faculty members agreed that IPE has the potential to remedy these challenges as long as opportunities are provided to inculcate equal power and contribution in meeting patients' needs.

**Conclusion**

These findings indicate the necessity of convening faculty development programs regarding IPC and IPE. Additionally, innovative strategies must be developed for the implementation of IPC and IPE in a variety of academic settings.


**Keywords:** attitude of health care professionals, interprofessional education, interprofessional healthcare collaboration.

## INTRODUCTION

The complexity of current worldwide health care practices requires good interprofessional collaboration (IPC). Moreover, excessive attention to the issue of patient safety within health care practice—with the triple aim of better care for individuals, better health for populations, and lower health care costs—has stimulated substantial discussion on the value of the IPC-based approach to patient care [1]. Health professionals from different professional backgrounds should work together as a team with patients and their families to improve patient outcomes, attain the highest quality of healthcare service, reduce costs, and improve the quality organizational outcomes [2].

To address this challenge, the World Health organization (WHO) in the Western Pacific Region, for instance, established the 5-year Human Resources for Health Action Framework (2011-2015) [3] which stipulates that Interprofessional education (IPE) is expected to play an important role in reducing the problems in the health care system by promoting effective collaboration [4]. Therefore, it is suggested that IPE should become part of health care curricula worldwide. Health care professionals are advised to receive IPE to deliver patient-cantered care as members of an interdisciplinary team, where students can learn IPC and bring their acquired knowledge, skills and values into their practice in the future [4, 5]. IPE is defined as involving students of 2 or more professions engaged in learning with, from and about each other to improve IPC and the quality of health care [6, 7]. IPE is understood to improve mutual respect and learners' understanding of other professions' roles and responsibilities [8]. Implementation of IPE in the Asian context, including its effectiveness and challenges, has been previously reported [9-13]

Faculty members or health care educators have crucial roles as facilitators of learning for effective IPE [14, 15]. In serving as effective teachers in IPE, they have to have good core competencies for interprofessional teaching, such as a commitment to IPE and practice and positive role modelling[16]. They also have to value the diversity and unique contributions of each health care profession within the health care team [16]. However, there are different attitudes about IPC among different faculty members, such as a lack of respect for or knowledge of other members, which can become barriers to IPE [17]. Previous research reported that faculty members were trained in traditional uni-professional systems that did not stress the importance of IPC in delivering healthcare practice [18]. Some programmes, such as dentistry and medical programmes, even emphasize the value of learners' self-reliance in

delivering health care practice[18]. Other complicating factors that might influence the implementation of IPE include the sociocultural situation, such as that in Southeast Asia, which is characterized by a very strong culture of social hierarchy[19]. As a result, in the region, certain professionals such as doctors are considered to have the highest position in society, marginalizing other health care professionals such as dentists, nurses and midwives. This significant hierarchical

issue might further complicate effective IPC and could potentially influence the attitude of faculty members toward IPC [20, 21].

Previous studies have reported that attitudes toward other professionals and IPC affect the quality and performance of individuals engaged in teamwork [22, 23]. Considering this impact, the attitudes of professional health care educators should be explored as it might influence their performance in performing their duty as teachers in IPE programmes. Previous studies reported on the attitudes of deans of health care education schools toward IPC and IPE in Asia [11, 24]. However, to the best of our knowledge, there have been limited publications that explore attitudes of faculty members toward IPC and IPE in Asian context. A study in Kingdom of Saudi Arabia reported favourable attitudes of healthcare faculty from 2 universities towards IPE [25]. The current study aimed to answer the following research questions:

1. What are the attitudes of health professional teachers toward IPC and IPE in South East Asia?
2. Which factors influence health professional teachers' attitude toward IPC and IPE?
3. How do health professional teachers explain their perception toward IPC and IPE implementation?

## METHOD

### Research Design

To answer the research questions, we selected an explanatory, sequential mixed-methods design [26]. We first collected quantitative data by administering a previously validated questionnaire titled "Attitude Towards Interprofessional Health Care Collaboration and Education", to health care teachers [27]. We specifically targeted teachers from the medical, nursing, midwifery and dentistry programmes of health care schools around Central Java Province, Indonesia. The results of the questionnaire were then used as input for the qualitative data collection consisting of four uni-professional FGs and interviews aimed to understand the underlying reasons of teachers' perceptions toward interprofessional healthcare collaboration and education; and to explore both the factors that hampers the effective IPC and whether IPE could address the problem.

### Context

Indonesia is a prototype of other densely populated East Asian countries with quite complex health problems. The primary health services are conducted at public health centres, which normally serves district areas. Primary healthcare is also done in private clinics, or private practice. Meanwhile the secondary and tertiary healthcare services are mostly provided in

hospitals, either public or private. Interprofessional health services are generally carried out both in public health services and hospitals. Yet, health professionals such as dentists and medical doctors can perform independent services. Midwifes and nurses in Indonesia generally work collaboratively with other medical personnel such as doctors and dentists in both hospitals and public health centres. However, they sometimes run individual medical practices, especially in remote areas where normally no doctors provide healthcare services. This might lead to conflicts among health professionals regarding overlapping of roles and responsibilities in private practice.

For educational institutions that offer only 1 study programme, such as a midwifery academy or a college of nursing, IPE might be difficult to administer unless the programme is conducted in collaboration with other universities that have multiple health-related study programmes. The educational methods of schools are not the same among the institutions; some use conventional teacher-cantered approaches with lecturing as the main teaching activity, and there are schools that have been implementing a horizontal–vertical integrated curriculum with hybrid problem-based learning (PBL).

Participants of this study were health professional teachers who worked in hospitals, public health care centres, or private health care practice. Teachers who work in hospitals and public health centres provide health care to patients and serve as clinical teachers for students of the clinical year programmes. Working in hospitals and public health care centres is usually interprofessional in nature and thus requires IPC. However, working in private practice (quite common in Indonesia) is usually uni-professional in nature. Some other teachers only perform their teaching role in the preclinical year programme and do not run health care practice either independently or collaboratively in hospitals or clinics. This difference in the need to collaborate interprofessionally in their health care practice could influence teachers' perception toward IPC and IPE Regarding the implementation of IPE, there are very few universities in Indonesia that have actually incorporated an IPE programme into their curriculum. Some of the universities have the intention to develop an IPE curriculum for their medical, nursing, midwifery, dentistry, and other health allied programmes. For this purpose, we conducted a survey of teachers' attitude toward IPC and IPE.

## Quantitative data collection: attitude questionnaire

To evaluate health professionals' attitude toward interprofessional healthcare teams and IPE, Curran et al. developed a detailed questionnaire, which consisted of 42 Likert-scaled items that were compiled and adopted from some previous studies [27]. A set of questions referring to factors from the literature that we knew could influence teachers' attitudes toward implementation of new IPE programme was added. These factors were as follows: a) study programme [28] b) educational background, c) academic title, d) institutions' background

(whether the institution was under the Ministry of Health or Ministry of Higher Education), and e) educational approach used in the school[29].

All the Likert scales used a 5-point rating, where 1= strongly disagree and 5 = strongly agree, with some reverse-scoring for negative questions. High scores on the questionnaire indicate good attitude toward IPC and IPE. The questionnaire was translated into the Indonesian language by means of a double/back-translation procedure to assess the consistency between the original and translated version. The data were collected from 17 health professional schools around Central Java by the research team members. The research team visited the institutions and met the lecturers, mostly after a regular meeting of lecturers conducted by the schools. The team explained to the respondents the aim of the study and what the study was about. Some important terms such as IPE and interprofessional healthcare collaboration were also explained. It was explained to the faculty members that their participation was voluntary and would not affect their performance assessment and the collected information would be kept confidential.

## Qualitative data collection: mono-professional focus group discussion and semi-structured interviews

Four uni-professional FGs were organized to explore underlying reasons for faculty members' perceptions toward interprofessional healthcare collaboration and IPE. We deliberately chose not to conduct mixed-profession FGDs to overcome potential barriers to communicating openly and freely due to professional gaps and to encourage participants in the discussion. Besides, it was possible that mixed-group FGDs may affect individual participants' responses, which can significantly have an effect on the outcome of studies [30]. As the results of quantitative analysis indicated that education, academic title, institutions, and teaching approach influenced the perception toward the interprofessional health care team and IPE, these variables were considered for selecting participants. Each of the FG groups consisted of 6–12 lecturers. If any faculty member did not wish to take part in the FG, another member who met similar criteria was invited to participate. In addition, in depth interviews were conducted with 3 senior lecturers of medical programmes because they could not take part in the FGDs, and their perceptions were considered valuable. Lecturers majoring in medical education (Dian Apriliana Rachmawati [DAR]) and community medicine (Suryani Yulianti [SY]) who understood the concept and aims of this study took part as facilitators of the FGDs. A discussion guide was used to facilitate each group discussion. The guide consisted of questions exploring health care professional teachers' perceptions regarding the following: 1) interprofessional health care collaboration and education, 2) problems of health care collaboration, and 3) the way in which IPE would contribute to remedying the problems. All FGDs and interviews were video-recorded.

## Analysis: attitude questionnaire

Factor analysis was used to explore the construct validity of the Indonesian version of the questionnaire, and Cronbach's alpha was calculated to determine internal consistency using the SPSS (version 20; IBM Corporation, Armonk, NY, USA). The Cronbach's alpha is acceptable if it is >0.7. The suitability of the correlation matrix was determined by the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The KMO score is considered as good and applicable if it is >0.7 and the Barlett's test of sphericity is significant with $P<0.05$. The numbers of factors retained for the initial solutions and entered into the rotation were determined with the application of Kaiser's criterion (eigenvalues >1). The initial factor extraction was performed using principal component analysis. Finally, we performed an exploratory factor analysis using Promax rotation to define the clearer structure. We performed Kruskal–Wallis and Mann–Whitney U statistical analyses using IBM SPSS (version 20.0) to evaluate the mean rank difference of total scores and dimension's score among subjects since the data were not normally distributed.

## Analysis: Focus groups and interviews

All FGs and interviews were transcribed verbatim by medical education experts. The results of this exercise were summarized and sent to all of the FGD participants and interviewees to do the member check procedure [31]. The verbatim transcripts were made in Indonesian and the contents were coded and analysed by 2 medical education experts (author EL and DAR). The 2 researchers independently evaluated the transcripts and developed coding categories. Afterwards they met and discussed the coding categories and agreed on the coding which they finally applied to the data. After this process, all members of the research team discussed the findings until they reached consensus of the overarching themes. For the thematic content analysis of qualitative data analysis, research software ATLAS.Ti (version 7; ATLAS.ti Scientific Software Development GmbH, Berlin, Germany) was used.

## FINDINGS

### Factorial analysis

The result of factorial analysis revealed that the KMO index was 0.953, indicating sampling adequacy, while the value of Bartlett sphericity chi-square index was 12,657.129, with P<0.001, rejecting the null hypothesis that the correlation matrix was an identity matrix and therefore unsuitable for factor analysis. Exploratory factor analysis with a limit of 4 extractions yielded 4 subscales. These results were different from those for the original questionnaire used by Curran et al., therefore, the authors had to rename the subscales. They were renamed as follows: subscale (1) attitude toward IPE and its implementation (22 items); subscale (2) Attitude toward interprofessional healthcare practice (10 items); subscale (3) attitude toward negative views of interprofessional healthcare practice and education (5 items); and subscale (4) attitude toward negative views of campus-based IPE implementation (3 items) with Alpha Cronbach 0.95, 0.88, 0.72, and 0.62, respectively. Question number 10 (Health professionals working as a team are more responsive than others to the emotional and financial needs of patients/clients) and Question number 41 (Faculty should be rewarded for participation in interprofessional courses) were excluded from the questionnaire as both questions had low loading (Table 1). The final version of the questionnaire was named "Attitude toward Interprofessional Health Care Collaboration and Education (ATIHC&E)".

**Table 1.** Factor Loading of each item

| | loadings I | II | III | IV |
|---|---|---|---|---|
| **Subscales** | $\alpha = 0.951$ | $\alpha = 0.833$ | $\alpha = 0.717$ | $\alpha = 0.617$ |
| **Attitude toward Interprofessional education and its implementation** | | | | |
| Q15 Interprofessional learning will help students think positively about other health care professionals | .451 | | | |
| Q17 Interprofessional learning before qualification will help health professional students to become better team-workers | .562 | | | |
| Q18 Patients would ultimately benefit if health care students worked together to solve patients problems | .473 | | | |
| Q19 Students in my professional group would benefit from working on small-group project with other health care students | .730 | | | |
| Q20 Communication skills should be learned with integrated classes of health care students | .588 | | | |
| Q21 Interprofessional learning will help to clarify the nature of patient problems for students | .722 | | | |
| Q23 Learning with students in other health professional schools helps undergraduates to become more effective member of health care team | .834 | | | |
| Q24 Interprofessional learning among health care students will increase their ability to understand clinical problems | .712 | | | |
| Q25 Interprofessional learning will help students to understand their own professional limitation | .723 | | | |
| Q26 For small group learning to work, students need to trust and respect each other | .429 | | | |
| Q27 Interprofessional learning among health professional students will help them to communicate better with patients and other professionals | .778 | | | |
| Q28 Team working skills are essential for all health care students to learn | .422 | | | |
| Q29 Learning between health care students before qualification would improve working relationships after qualification | .659 | | | |
| Q30 Interprofessional learning better utilizes resources | .501 | | | |
| Q31 It is important for academic helath center campuses to provide interprofessional teaching opportunities | .713 | | | |
| Q32 Interprofessional learning should be a goal of this campus | .746 | | | |
| Q33 Students like courses taught by faculty from other academic departments | .684 | | | |
| Q34 Students like courses that include students from other academic departments | .633 | | | |
| Q35 Faculty should be encourage to participate in interprofessional courses | .825 | | | |
| Q36 Faculty like teaching to students in other academic department | .573 | | | |
| Q37 Faculty like teaching with faculty from other academic departments | .581 | | | |
| Q39 Interprofessional efforts require support from campus administration | .641 | | | |
| **Attitude toward interprofessional health care** | | | | |
| Q1 Patients / clients receiving interprofessional care are more likely than others to be treated as a whole person | | .652 | | |

**Table 1.** CONTINUED

| Subscales | loadings I α = 0.951 | II α = 0.833 | III α = 0.717 | IV α = 0.617 |
|---|---|---|---|---|
| Q3 The give and take among team members help them make better patient/client care decisions | | .684 | | |
| Q4 The interprofessional approach makes the delivery of care more efficient | | .643 | | |
| Q5 Developing patient/client care plan with other team members avoids errors in delivering care | | .792 | | |
| Q7 working in an interprofessional environment keeps most health | | .617 | | |
| Q8 The interprofessional approach improves the quality of care to patients/ clients | | .612 | | |
| Q11 The interprofessional approach permits health professionals to meet the need of family caregivers as well as patients | | .630 | | |
| Q12 having to report observation to a team helps team members better understand the work of other health professionals | | .529 | | |
| Q13 Hospital patients who receive interprofessional team care are better prepared for discharge than other patients | | .585 | | |
| Q14 The team meetings foster communication among members from different professions or disciplines | | .468 | | |
| **Attitude toward negative views of interprofessional health care practice and education** | | | | |
| Q2 Developing an interprofessional patients/clients care plan is excessively time consuming* | | | .544 | |
| Q6 Working in interprofessional manner unnecessarily complicates things most of the time* | | | .531 | |
| Q9 In most instances the time required for interprofessional consultations could be better spent in other ways* | | | .666 | |
| Q16 Clinical problem solving can only be learned effectively when students are taught within their individual department/school* | | | .747 | |
| Q22 It is not necessary for undergraduate health care students to learn together* | | | .766 | |
| **Attitude toward negative views of IPE implementation in campus based** | | | | |
| Q38 Interprofessional efforts weaken course content* | | | | .510 |
| Q40 Interprofessional courses are logistically difficult* | | | | .682 |
| Q42 Accreditation requirements limit interprofessional effort* | | | | .585 |

## Quantitative results: questionnaire

Out of 741 clinical and pre-clinical teachers from 17 institutions, 555 participants filled in the questionnaire, however, 6 of them were excluded because they did not complete the questionnaire. Thus, in total, data were collected from 549 participants, giving a response rate of 74.1% (Table 2).

**Table 2.** Demographic characteristics of respondents

| | Midwifery | | Nurse | | Dentistry | | Medical | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Gender | | | | | | | | |
| Male | 0 | 0 | 99 | 44.0 | 17 | 27.4 | 75 | 45.7 |
| Female | 100 | 100 | 126 | 56.0 | 45 | 72.6 | 88 | 54.3 |
| Level of Education | | | | | | | | |
| Assistant Bachelor | 4 | 4 | 70 | 31.1 | 9 | 14.5 | 0 | 0 |
| Bachelor | 59 | 59 | 68 | 30.2 | 23 | 37.1 | 48 | 29.6 |
| Master/Clinician | 37 | 37 | 85 | 37.8 | 24 | 38.7 | 105 | 64.8 |
| PhD | 0 | 0 | 2 | 0.9 | 6 | 9.7 | 9 | 5.6 |
| Academic tittle | | | | | | | | |
| Hasn't got any | 79 | 79 | 171 | 76.0 | 35 | 56.5 | 118 | 72.8 |
| Assistance lecturer | 15 | 15 | 43 | 19.1 | 6 | 9.7 | 29 | 17.9 |
| Senior Lecturer | 6 | 6 | 11 | 4.9 | 14 | 22.6 | 8 | 4.9 |
| Associate Professor | 0 | 0 | 0 | 0 | 7 | 11.2 | 7 | 4.4 |
| Professor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Length of Employment | | | | | | | | |
| 0 – 5 years | 48 | 48 | 125 | 55.6 | 33 | 53.2 | 63 | 38.9 |
| 6 – 10 years | 26 | 26 | 55 | 24.4 | 10 | 16.1 | 50 | 30.9 |
| 11-15 years | 24 | 24 | 26 | 11.6 | 6 | 9.7 | 20 | 12.3 |
| 16 -20 years | 1 | 1 | 15 | 6.7 | 1 | 1.6 | 14 | 8.6 |
| 21 – 25 years | 1 | 1 | 2 | 0.9 | 8 | 12.9 | 3 | 1.9 |
| 26 – 30 years | 0 | 0 | 1 | 0.4 | 1 | 1.6 | 7 | 4.3 |
| 31 - more | 0 | 0 | 1 | 0.4 | 3 | 4.8 | 5 | 3.1 |
| Collaborate with other Health care professional in Health care practice | | | | | | | | |
| Yes | 37 | 37 | 106 | 47.1 | 36 | 58.1 | 130 | 80.2 |
| No | 63 | 63 | 119 | 52.9 | 26 | 41.9 | 32 | 19.8 |
| Institution | | | | | | | | |
| Ministry of Health | 43 | 43 | 101 | 44.9 | 18 | 29.0 | 15 | 9.3 |
| Ministry of Higher Education | 57 | 57 | 124 | 55.1 | 44 | 71.0 | 149 | 90.7 |
| Teaching method at school | | | | | | | | |
| Conventional teacher cantered | 68 | 68 | 120 | 53.3 | 27 | 43.5 | 16 | 9.9 |
| PBL | 32 | 32 | 105 | 46.7 | 55 | 56.5 | 146 | 90.1 |

The Kruskal–Wallis and Mann–Whitney U statistical analyses revealed that the median scores differed significantly among groups and characteristics (Table 3). The evaluated variables namely: profession, level of education, academic title, length of employment, working collaboratively in healthcare team, institutions' background, and teaching method at school; were responsible for the score differences, and it can be inferred that these variables influenced teachers' attitudes toward interprofessional healthcare teams and IPE. Senior lecturers who had been working for 11-15 years, had been working collaboratively in healthcare teams and were from institution under the ministry of Higher Education which implementing conventional teaching method, had higher median score of ATIHC&E. The median of the total ATIHC&E score of nursing was the highest among professionals, indicating that nurses had more positive attitude toward IPE compared with other professionals. Clinicians have the highest median score among other educational levels. It is interesting that associate professors, those who have worked more than 30 years and those who worked in institutions applying PBL had the lowest median scores within their groups.

**Table 3.** Median and mean rank difference of total ATIHC&E score

| | Total score ATIHC&E | |
|---|---|---|
| | Median | p |
| Profession | | |
| Midwife | 3.93 | 0.012* |
| Nurse | 3.95 | |
| Dentist | 3.92 | |
| Medical Doctor | 3.88 | |
| Gender | | |
| Male | 3.88 | 0.132 |
| Female | 3.93 | |
| Level of Education | | |
| Assistant Bachelor | 3.83 | 0.000* |
| Bachelor | 3.88 | |
| Master/Clinician | 4.09 | |
| PhD | 3.88 | |
| Academic title | | |
| Hasn't got any | 3.91 | 0.001* |
| Assistance lecturer | 4.00 | |
| Senior Lecturer | 4.19 | |
| Associate Professor | 3.79 | |
| Professor | 0 | |
| Length of Employment | | |
| 0 – 5 years | 3.90 | 0.000* |
| 6 – 10 years | 3.90 | |
| 11-15 years | 4.24 | |
| 16 -20 years | 3.86 | |
| 21 – 25 years | 3.96 | |
| 26 – 30 years | 3.64 | |
| 31 - more | 3.64 | |
| Work collaboratively as healthcare team | | |
| No | 3.88 | 0.000† |
| Yes | 4.07 | |
| Institution | | |
| Ministry of Health | 3.81 | 0.000† |
| Ministry of Higher Education | 4.02 | |
| Teaching method at school | | |
| Conventional teacher cantered | 4.09 | 0.000† |
| PBL | 3.90 | |

*) significant based on Kruskal Wallis Test

†) significant based on Mann Whitney U Test

There was no significant difference in the mean scores for all items in the subscale "attitude toward the negative views of campus-based IPE implementation" among professions. Nevertheless, 5 items of the "attitude toward interprofessional health care" subscale and 1 item of the "attitude toward negative views of interprofessional health care practice and education" subscale had significantly different mean scores (Table 4).

**Table 4.** Mean difference of each item

| | Midwifery | Nursing | Dentistry | Medical | p |
|---|---|---|---|---|---|
| **Attitude toward Interprofessional education and its implementation** | | | | | |
| Q15 Interprofessional learning will help students think positively about other health care professionals | 4.35 ± 0.71 | 4.40 ± 0.66 | 4.50 ± 0.53 | 4.20 ± 0.64 | 0.031 |
| Q17 Interprofessional learning before qualification will help health professional students to become better team-workers | 4.23 ± 0.75 | 4.29 ± 0.61 | 4.25 ± 0.80 | 4.06 ± 0.86 | 0.017 |
| Q18 Patients would ultimately benefit if health care students worked together to solve patients' problems | 4.15 ± 0.72 | 4.26 ± 0.68 | 4.31 ± 0.58 | 4.06 ± 0.72 | 0.027 |
| Q19 Students in my professional group would benefit from working on small-group project with other health care students | 4.19 ± 0.82 | 4.38 ± 0.61 | 4.18 ± 0.75 | 3.87 ± 0.91 | 0.000 |
| Q20 Communication skills should be learned with integrated classes of health care students | 3.51 ± 1.10 | 4.03 ± 0.8 | 3.88 ± 0.87 | 3.73 ± 0.91 | 0.000 |
| Q21 Interprofessional learning will help to clarify the nature of patient problems for students | 3.98 ± 0.76 | 4.24 ± 0.63 | 4.09 ± 0.71 | 3.73 ± 0.95 | 0.000 |
| Q23 Learning with students in other health professional schools helps undergraduates to become more effective member of health care team | 4.16 ± 0.66 | 4.35 ± 0.56 | 4.14 ± 0.62 | 4.00 ± 0.81 | 0.000 |
| Q24 Interprofessional learning among health care students will increase their ability to understand clinical problems | 4.30 ± 0.54 | 4.26 ± 0.6 | 4.34 ± 0.57 | 4.09 ± 0.7 | 0.013 |
| Q25 Interprofessional learning will help students to understand their own professional limitation | 4.12 ± 0.6 | 4.25 ± 0.51 | 4.05 ± 0.77 | 3.96 ± 0.78 | 0.000 |
| Q26 For small group learning to work, students need to trust and respect each other | 4.44 ± 0.49 | 4.44 ± 0.62 | 4.50 ± 0.50 | 4.30 ± 0.59 | 0.000 |
| Q27 Interprofessional learning among health professional students will help them to communicate better with patients and other professionals | 4.32 ± 0.66 | 4.46 ± 0.59 | 4.29 ± 0.49 | 4.07 ± 0.70 | 0.000 |
| Q28 Team working skills are essential for all health care students to learn | 4.37 ± 0.59 | 4.43 ± 0.58 | 4.43 ± 0.59 | 4.22 ± 0.61 | 0.004 |
| Q29 Learning between health care students before qualification would improve working relationships after qualification | 4.27 ± 0.77 | 4.39 ± 0.57 | 4.26 ± 0.65 | 4.04 ± 0.72 | 0.000 |
| Q30 Interprofessional learning better utilizes resources | 4.47 ± 0.61 | 4.28 ± 0.59 | 4.32 ± 0.56 | 4.14 ± 0.74 | 0.001 |
| Q31 It is important for academic health centre campuses to provide interprofessional teaching opportunities | 4.23 ± 0.60 | 4.34 ± 0.63 | 4.32 ± 0.50 | 4.06 ± 0.81 | 0.001 |
| Q32 Interprofessional learning should be a goal of this campus | 4.01 ± 0.73 | 4.09 ± 0.61 | 3.79 ± 0.85 | 3.91 ± 0.89 | 0.014 |
| Q33 Students like courses taught by faculty from other academic departments | 3.83 ± 0.79 | 4.02 ± 0.68 | 3.95 ± 0.68 | 3.80 ± 0.77 | 0.022 |
| Q34 Students like courses that include students from other academic departments | 4.07 ± 0.65 | 4.19 ± 0.60 | 4.02 ± 0.61 | 3.82 ± 0.73 | 0.000 |
| Q35 Faculty should be encouraged to participate in interprofessional courses | 4.28 ± 0.62 | 4.28 ± 0.55 | 4.29 ± 0.55 | 3.99 ± 0.79 | 0.000 |
| Q36 Faculty like teaching to students in another academic department | 3.59 ± 0.92 | 3.80 ± 0.76 | 3.74 ± 0.74 | 3.77 ± 0.76 | 0.166 |

**Table 4.** CONTINUED

| | Midwifery | Nursing | Dentistry | Medical | p |
|---|---|---|---|---|---|
| Q37 Faculty like teaching with faculty from other academic departments | 3.72 ± 0.87 | 3.94 ± 0.72 | 3.82 ± 0.71 | 3.79 ± 0.75 | 0.056 |
| Q39 Interprofessional efforts require support from campus administration | 4.16 ± 0.70 | 4.23 ± 0.63 | 4.19 ± 0.59 | 4.02 ± 0.76 | 0.019 |
| **Attitude toward interprofessional healthcare** | | | | | |
| Q1 Patients / clients receiving interprofessional care are more likely than others to be treated as a whole person | 4.50 ± 0.50 | 4.60 ± 0.54 | 4.47 ± 0.56 | 4.52 ± 0.60 | 0.186 |
| Q3 The give and take among team members help them make better patient/client care decisions | 4.50 ± 0.73 | 4.39 ± 0.75 | 4.50 ± 0.56 | 4.38 ± 0.73 | 0.409 |
| Q4 The interprofessional approach makes the delivery of care more efficient | 4.19 ± 0.80 | 4.27 ± 0.65 | 4.19 ± 0.64 | 4.07 ± 0.83 | 0.083 |
| Q5 Developing patient/client care plan with other team members avoids errors in delivering care | 4.27 ± 0.71 | 4.34 ± 0.60 | 4.40 ± 0.55 | 4.28 ± 0.68 | 0.459 |
| Q7 working in an interprofessional environment keeps most health | 3.94 ± 0.78 | 4.22 ± 0.58 | 4.17 ± 0.66 | 4.08 ± 0.74 | 0.006 |
| Q8 The interprofessional approach improves the quality of care to patients/ clients | 4.38 ± 0.61 | 4.40 ± 0.53 | 4.37 ± 0.52 | 4.28 ± 0.77 | 0.260 |
| Q11 The interprofessional approach permits health professionals to meet the need of family caregivers as well as patients | 3.59 ± 0.90 | 3.99 ± 0.66 | 3.85 ± 0.76 | 3.90 ± 0.77 | 0.000 |
| Q12 having to report observation to a team helps team members better understand the work of other health professionals | 4.07 ± 0.71 | 4.24 ± 0.57 | 4.27 ± 0.51 | 4.08 ± 0.69 | 0.016 |
| Q13 Hospital patients who receive interprofessional team care are better prepared for discharge than other patients | 3.80 ± 0.81 | 4.29 ± 0.67 | 4.05 ± 0.66 | 3.99 ± 0.76 | 0.000 |
| Q14 The team meetings foster communication among members from different professions or disciplines | 4.31 ± 0.63 | 4.39 ± 0.62 | 4.45 ± 0.53 | 4.20 ± 0.65 | 0.031 |
| **Attitude toward negative views of interprofessional health care practice and education** | | | | | |
| Q2 Developing an interprofessional patients/clients care plan is excessively time consuming* | 3.00 ± 1.08 | 3.00 ± 1.20 | 3.04 ± 1.07 | 3.09 ± 1.14 | 0.869 |
| Q6 Working in interprofessional manner unnecessarily complicates things most of the time* | 2.82 ± 1.14 | 3.08 ± 1.10 | 2.37 ± 0.99 | 2.77 ± 1.18 | 0.000 |
| Q9 In most instances the time required for interprofessional consultations could be better spent in other ways. * | 3.32 ± 1.08 | 3.41 ± 1.19 | 3.19 ± 1.09 | 3.33 ± 1.04 | 0.566 |
| Q16 Clinical problem solving can only be learned effectively when students are taught within their individual department/school* | 3.27 ± 0.98 | 3.10 ± 1.22 | 3.11 ± 1.10 | 3.36 ± 1.00 | 0.123 |
| Q22 It is not necessary for undergraduate health care students to learn together* | 3.38 ± 1.07 | 3.43 ± 1.20 | 3.56 ± 1.06 | 3.47 ± 1.04 | 0.766 |
| **Attitude toward negative views of IPE implementation in campus based** | | | | | |
| Q38 Interprofessional efforts weaken course content* | 3.67 ± 0.98 | 3.40 ± 0.99 | 3.38 ± 0.92 | 3.39 ± 0.96 | 0.094 |
| Q40 Interprofessional courses are logistically difficult* | 3.12 ± 1.10 | 4.16 ± 0.71 | 4.20 ± 0.62 | 3.95 ± 0.83 | 0.133 |
| Q42 Accreditation requirements limit interprofessional effort* | 3.54 ± 0.93 | 3.17 ± 1.05 | 3.24 ± 1.06 | 3.33 ± 0.98 | 0.210 |

*Items Q2, Q 6, Q9, Q16, Q22, Q38, Q40 and Q42 are reversed scored

## FGD and interview results

To obtain the underlying reasons for teachers' attitudes toward health care IPC and IPE, the results of the questionnaires were discussed during FGDs and interviews with 29 participants from midwifery, nursing, dentistry, and medical programmes (Table 5).

**Table 5.** Demographic characteristics of FG and interview participants

| | Midwifery | | Nurse | | Dentistry | | Medical | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Gender | | | | | | | | |
| Male | 0 | 0 | 3 | 50.0 | 3 | 50.0 | 3 | 30.0 |
| Female | 7 | 100 | 3 | 50.0 | 3 | 50.0 | 7 | 70.0 |
| Age | | | | | | | | |
| 20-30 years | 3 | 42.9 | 2 | 33.3 | 2 | 33.3 | 4 | 40.0 |
| 31-40 years | 1 | 14.3 | 4 | 66.7 | 1 | 16.7 | 3 | 30.0 |
| 41-50 years | 3 | 42.9 | 0 | 0 | 2 | 33.3 | 0 | 0 |
| 51-more years | 0 | 0 | 0 | 0 | 1 | 16.7 | 3 | 30.0 |
| Level of Education | | | | | | | | |
| Bachelor | 0 | 0 | 0 | 0 | 1 | 16.7 | 5 | 50.0 |
| Master/Clinician | 7 | 100 | 6 | 100 | 5 | 83.3 | 2 | 20.0 |
| PhD | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 30.0 |
| Academic title | | | | | | | | |
| Hasn't got any | 4 | 57.1 | 1 | 16.7 | 3 | 50 | 7 | 70.0 |
| Assistance lecturer | 2 | 28.6 | 5 | 83.3 | 2 | 33.3 | 2 | 20.0 |
| Senior Lecturer | 1 | 14.3 | 0 | 0 | 0 | 0 | 2 | 20.0 |
| Associate Professor | 0 | 0 | 0 | 0 | 1 | 16.7 | 1 | 10.0 |
| Professor | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Length of Employment | | | | | | | | |
| 1 – 15 years | 4 | 57.1 | 6 | 100 | 5 | 83.0 | 8 | 80.0 |
| >15 years | 3 | 28.6 | 0 | 0 | 1 | 7.0 | 2 | 20.0 |
| Involved /Run healthcare practice | | | | | | | | |
| Yes | 3 | 42.9 | 4 | 66.7 | 5 | 83.3 | 9 | 90.0 |
| No | 4 | 57.1 | 2 | 33.3 | 1 | 16.7 | 1 | 10.0 |
| Collaboration with other Health care professional in Health care practice | | | | | | | | |
| Yes | 3 | 42.9 | 4 | 66.7 | 5 | 83.3 | 4 | 40.0 |
| No | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 50.0 |
| Do not involved in HC practice | 4 | 57.1 | 2 | 33.3 | 1 | 16.7 | 1 | 10.0 |

There were some challenges that could be identified from the FGDs concerning the implementation of IPE, which were as follows: 1) organization of the learning process, 2) reduction in students' opportunity to learn certain hands-on clinical skills due to collaboration, and 3) lack of good role model of collaboration in hospital. However, almost all of the participants in the FGDs were optimistic that 4) IPE could be a potential remedy for the problem of IPC.

## 1. Organization of the learning.

Some teachers stated that IPE would be difficult to apply within each programmes' fixed schedule and curriculum. Besides, a health professional education curriculum is very time-intensive; therefore, it would be burdensome if the IPE would be added to an already full curriculum. The possible alternative solution suggested was that the IPE activities could be embedded within the learning activities of existing modules. Of course, this step requires the willingness of the module team to provide learning activities that use IPE, which requires collaborative work in designing the activities with health care teachers from other programmes.

> *"The burden of credit hour for pre-clinical year of medical students has been very much. Adding credit hour for IPE will add to the burden on students. It will be additional work for teachers as we have to work together with teachers form other healthcare professional programmes to arrange the learning activities. That would be another additional work […]" (Medical teacher 3)*

Some teachers also complained about logistic problems for IPE to be implemented. Problems of scheduling, class arrangement and selection of tutors or instructors for the learning activities would certainly be very complicated.

> *"In my opinion, before IPE is implemented, we must be prepared for logistic problems. We will need a lot of discussion rooms and clinical skill rooms with all equipment needed for the skill teaching. Are we ready for this?" (Nursing teacher 4)*

The problem of organizing the learning was also voiced by teachers from educational institutions that only provided a single health care professional education programme. It is common in Indonesia for schools to administer a single professional education programme, such as a school of midwifery. Normally, these schools are under the organization of Ministry of Health. This uni-professional learning situation makes it difficult for them to run IPE, unless they collaborate with other institutions that organize different health care professional education programmes

> *"We have difficulty implementing IPE because we only manage one midwifery programme ..." (Midwifery teacher 2)*

2. IPE might reduce students' opportunity to learn hands-on some clinical skills.

Some teachers were not supportive of IPE because they felt that by learning to handle patients together, students would lose opportunities to practice clinical skills that they should also master but would eventually become (in clinical practice) the role and responsibility of students from other professions. They would have more opportunities to learn the skills when studying in a uni-professional setting

> *"[…] For example, medical students must also be able to master administering infusion, when there are no other professional students working together with them, they will certainly be challenged to master these skills. In contrast, if there are nursing students learning together with medical students in IPE context, infusion will be done by nursing rather than by medical students as the treatment is within the nurse's responsibility" (Medical teacher 5)*

3. Lack of good role models of health care team collaboration in hospital.

Some teachers mentioned concerns that actual IPC in health care is problematic. Participants talked about problems such as the different perceptions of the needs of patients between or among professionals, unequal participation in decision-making, lack of face-to-face interaction, and overlapping of roles and responsibilities. Observing this could affect students' perceptions about and eventual performance of IPC. The teachers argued that in order for IPE to run properly, hospitals must be prepared to improve the quality of the collaboration culture among their health care professionals.

> *"Collaboration between health workers in the hospital still needs to be improved, as students will learn to perform good team collaboration from the workers" (Nursing teacher 2)*

The main challenges of interprofessional healthcare collaboration that could be identified from the FGDs and the interviews were: (A) the differing perceptions of the needs of patients between or among professionals, (B) unequal participation in decision-making, (C) lack of face-to-face interaction, and (D) overlapping of roles and responsibility

A. Differing perception of the needs of the patients between or among professionals

Some teachers explained that the core issues that cause conflict within interprofessional health care teams were differences in perception regarding the treatment or the patient's needs. As they have different academic backgrounds and knowledge, the offered patient management is sometimes different, which in turn has the potential to lead to a conflict between or among health professionals.

> *Sometimes I had different perception with the doctor concerning the appropriate time to discharge a patient as the result of differing reasoning between us. (Nursing teacher 5)*

B. Unequal participation in decision-making

Health professionals, such as nurses and midwives, reported that they often find obstacles in participating in decision-making, especially during ward rounds. They only served to convey information and answer doctors' questions regarding the condition of the patients, and not be involved in providing input to decision-making. From the FG discussion, the main cause of unequal participation could be identified from the history of health care professional education, which was considered as unequal. The long-standing habits became a challenge for developing a collaboration culture in hospitals

> *"… However, in my opinion it (the unequal participation) cannot be separated from history. The nurse's education was high school level in the colonial era; meanwhile, medical education was a higher education programme since its establishment... Nurses have been considered doctors' assistants in hierarchy". (Nursing teacher 6)*

C. The lack of face-to-face interaction

Unpleasant communication among health professionals was a complaint among almost all professionals in the discussion. However, all participants understood that health professionals are busy, and that therefore face-to-face communication is difficult to conduct; consequently, documentation becomes a vital tool for communication.

> *"In dealing with a patient's problem, communication is done through medical records, so, there is no face-to-face communication done. This may result in suggestions given by other professionals being unclear and misunderstood […]. (Midwifery teacher 4)*

D. Overlapping of roles and responsibility

Participants in FGs argued that overlapping roles and responsibilities were important problems in interprofessional health care collaboration. A lack of clarity over roles and responsibilities of professionals can lead to a breakdown in communication, which may have a direct impact on the patients and their outcomes. From the discussion, it could be identified that overlapping roles among health care professionals, community or client misperception concerning health care service, health care practice regulation not being put into effect, and economic factors or professional income problem, were the main triggers

> *"Sometimes people do not know what illness they had and to what health professionals they have to visit to heal their sickness. "(Midwifery teacher 1)*

## 5. IPE has the potential to remedy the problem.

Most teachers argued that IPE provided an opportunity to students to improve the skills needed for better IPC, such as communication and team-working skills, as well as to respect the roles and responsibilities of other professions. They also suggested that IPE requires integration early in undergraduate curricula. Some methods of the learning activities were also identified during the FGDs. The point was that the activities should provide opportunity to share knowledge and skill, as well to inculcate equal power and contribution in solving patients' problems based on each professional's roles and responsibilities.

> *"In my opinion, to inculcate understanding of role and responsibility and of good and equal participation of healthcare professionals, I suggest that IPE should include discussion forums. Students should be trained to conduct discussions among different healthcare professionals with topics around the management of patients. (Medical teacher)*

Some teachers also suggested that the use of technology could be applied to reduce the logistical complexities. The technology could be applied such as for virtual tutorial.

## DISCUSSION

This present study explored the attitude of health care professionals toward IPC and IPE, what are the most important factors influencing the attitude, how the teachers explain factors that mitigate health care collaboration practice in Indonesia, and whether IPE could remedy the problems. To answer the first and second questions, we had the original survey titled "Attitude toward Interprofessional Care and Education by Curran et al [27] translated into Indonesian and adapted to the Indonesian context. The translated version proved valid and reliable after an exploratory factor analysis resulting in 40 items.

Professional background, educational background, academic title, length of employment, working collaboratively as health care team, institutional background, and the teaching approach used in the school appear to be characteristics that were associated with the attitudes of health professionals toward IPC and IPE. Qualitative data analysis showed that health professional education teachers had negative perceptions toward health care collaboration in hospitals. They had positive perceptions toward IPE implementation, however, despite their complaint concerning the challenges that would be faced during the IPE implementation.

The finding indicated that nurses had a better attitude toward IPC and IPE than other health professionals. This finding confirms the results of a previous study, which reported that medical faculty members had significantly lower mean score than nursing faculty on attitude towards IPE [27]. Nursing faculty members were also reported to have a more favourable attitude than any other profession in another study [32]. The positive attitude of the nurses toward interprofessional health care teams and IPE may be due to the nature of the profession, which requires constant cooperation with other professionals during performance of their duties. The positive attitude of nurses toward health care teams and IPE may also be due to the higher expectation of the nursing profession to achieve better results from IPE to improve the quality of collaboration among health care teams. Meanwhile, the characteristics of medical, dentistry, and midwifery education, which emphasizes the importance of independence and confidence in delivering care practice, might influence the professionals' lower attitude toward IPC and IPE [15]. As faculties have very critical role in delivering IPE, the findings suggested that conducting faculty development is essential to prepare and support IPE facilitators in order to deliver effective IPE [2].

The survey results suggested that health professional teachers' backgrounds were associated to the attitudes toward IPC and IPE. The findings confirmed previous research that reported that health professionals experienced in IPC in health care teams had a more positive perception of IPE and valued teamwork [23]. Health professional teachers from institutions with a PBL approach had low score regarding attitude toward health care practice and IPE. Previous literature has reported that faculties of institutions with a fixed curriculum, such as the ones applying the PBL approach, tend to be reluctant to implement new programmes such as IPE because there will be some logistic problems that should be addressed, such as curriculum, timetable, class size, and assessment methods [33-35]. In the PBL curriculum, timetables are fixed, that makes it difficult to embed learning activity such as IPE.

Our analysis of qualitative data indicating that the faculty's perceptions of IPE is positive, as they believe that IPE has potential to remedy the problem of interprofessional healthcare collaboration, consistent with the results from other studies exploring this area. [36-38] These studies suggested that positive perceptions of IPE are global and held in common by health professional teachers [39]. However, this study indicated that there were some teachers who worried about the barriers that will be encountered on implementing IPE.

It was reported in literature that implementation of interprofessional curriculum is challenging [33, 34] Some challenges that hinder the development of IPE include inflexible curricula, timetables, established separate clinical placement systems, large student numbers, institutional policies and professional accreditation requirements also reported in other studies elsewhere[33, 34]. Many of these barriers were also identified in our FGDs and interviews as being hurdles that had to be overcome. However, most teachers believed that with strong commitment to IPE and the intention to remedy IPC problems, the barriers could be overcome. In this context, executive leadership commitment to IPE is critical. This commitment needs to be in the form of role models for change, authority to challenge resistance, and to establish and lead IPE accountability [40].

The positive perception toward IPE was demonstrated by the enthusiastic suggestions regarding where and how IPE could be used to improve teaching and learning in the health professional education. Possible topics, materials, and methods of teaching and learning were suggested. Participants suggested that the learning activities should include discussion, as well as sharing of knowledge and skills to support equal contributions to solve patients' problem among health care professional students. Previous studies reported that some active learning approaches such as community-based learning, ethics, communication, discussion, epidemiology, evidence-based practice, project-based learning and role-play simulations, were effective topics for IPE [35, 38, 40]. It was interesting that some teachers enthusiastically suggested the use of new technologies to develop IPE collaboration. Due to logistical complexities, such as timetabling and a large number of students, technologies such as interprofessional virtual tutorials and virtual simulation technology could facilitate improvement of collaboration. Recent research in this area is promising [41].

Moreover, teachers agreed that IPE requires early integration in undergraduate curricula. They recommended embedding IPE within some modules offered in the curriculum of the health profession education programmes. The suggestion to embed IPE early as an integrative component – rather than as an optional supplement – to the core curriculum is gaining support [42]. It was reported that early exposure to teams from at least 3 disciplines will increase collaboration and develop mutual recognition and respect [43].

Some challenges on interprofessional health care collaboration could be identified during the FGDs. One of the participants revealed that the differences in perception about the patient's condition often led to goal differences, which in turn led to conflicts between health workers [44]. A conflict resolution strategy that focuses on developing conflict resolution protocols and a reliance on the leadership of the organization should be developed by the health care team

members and should be implemented to minimize the challenges of these conflicts [45]. Learning how to do this is a vital part of IPE outcomes [46].

Another reported problem of interprofessional health professional collaboration was unequal participation in decision-making, which indicates unequal power relations among health professionals. Similar problems were reported in other researches [20, 44, 45]. This historical subordinate relationship may contribute to behaviours that are not conducive to collaboration [47, 48]. The uneven knowledge acquisition made the doctors settle on their own decisions and disregard nurses and health professionals other than doctors, as opposed to accepting unsolicited information[45]. The perception that other health professionals would be inferior to doctors also gives nurses and midwives less confidence to take active participation in solving patients' problems. It has been frequently reported that nursing students were perceived inferior to medical students with respect to several characteristics, including status in society, competence, and academic ability [9, 10, 49]. IPE - with its various learning activities must facilitate students to develop confidence. Nursing, midwifery and other health professional students should take their profession forward and collaborate with others, to the ultimate benefit of all concerned. They should recognize that each health profession is different from, but equally as important as, medicine for people's health. They have to be confident of the value of their own profession and therefore of the legitimacy of their roles as full members (and sometimes leaders) of health care teams and can therefore identify and pursue their roles in their own context. IPE carried out through the education of health professional education, is expected to overcome the self-distrust problem [18].

Dialogue through documentation is another problem that could lead to conflict in interprofessional health care. Face-to-face communication is understood as an important facet of interprofessional health care, although in certain situations, such as in an acute hospital setting, case notes are often the main source of communication when professionals cannot hold regular interprofessional meetings. However, there should be more direct interaction between members of the interprofessional team because they may occasionally have misperceptions when communication is only done through documentation [44]. To resolve this issue, integration through communication activities, such as multidisciplinary rounds within each team, weekly meetings of clinical case managers, and medical staff meeting reports, could be performed[50]. Health professionals in hospitals should become role models to implement good IPC in health care services and create a culture of collaboration and communication within the health care team.

This study contributes to literature as, to the best of our knowledge, it is the only study that has explored the attitude of health care professionals toward IPC and IPE by applying a mixed-method study approach, which allows exploring in-depth information of health care professionals' perception toward IPC and IPE. Previous studies on similar topics generally used a quantitative design. Although the data were collected from 17 health care educational institutions in Central Java Province, they might not represent the perceptions of all Indonesian health care professionals. Similar studies could be conducted with a broader population.

## CONCLUSION

Nurses' mean scores for the attitude toward health care practice and IPE were higher than those of other health care professionals. The findings have implications both for the advancement of IPE within academic institutions and for collaborative strategies to promote faculty development initiatives. Faculty members agreed that IPE has the potential to remedy health care collaboration problems as long as it provides opportunity to inculcate equal power and contribution in solving patients' problems. There were 4 main problems of interprofessional health care collaboration that could be identified from the FGDs and interviews. Communication and conflict resolution skills are urgent subjects that need to be taught in IPE, because these mentioned problems potentially generated conflict. Health professionals in hospitals or other health care services should become role models to help create and implement good IPC in health care services and ensure successful implementation of IPE initiatives. Meanwhile, hospitals and other health care services should also help and ensure that various programmes create a good, positive culture of IPC, so that patients can be treated effectively.

### Ethics approval and consent to participate

The study was approved by the Bioethics Committee for Medical/Health Research Faculty of Medicine, Islamic University of Sultan Agung Semarang (letter number 290/ XII/2013/Komisi Bioetik) and was conducted at 17 health professional schools in Central Java, Indonesia. Participants would not be exposed to physical risk for taking part this study. Information regarding the purpose of the study was explained to the respondents by the research team members, the academic administrators of the school, or representatives appointed by the academic administrators. The respondents were informed that their participation in this study was on a voluntary basis and that their answers to the items would not affect any consideration on teacher performance assessment. Consent was implied by the fact that respondents completed the questionnaire and took part in the FGD voluntarily. To ensure confidentiality, we anonymized both the questionnaires and the transcripts of the FGDs and personal interviews.

### Data sharing statement

Materials and supporting data are available for download on the website: https://drive.google.com/drive/folders/0B_CPaqF-zFD3cHBVZWtaaTl3STQ?usp=sharing. All files may be used for research and education without further consent.

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CHAPTER 4

# DOES PBL DELIVER CONSTRUCTIVE COLLABORATION FOR STUDENTS IN INTERPROFESSIONAL TUTORIAL GROUPS?

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## ABSTRACT

**Background**

Training health professional students in teamwork is recognized as an important step to create interprofessional collaboration in the clinical workplace. Interprofessional problem-based learning (PBL) is one learning approach that has been proposed to provide students with the opportunity to develop the necessary skills to work collaboratively with various health professionals. This study aimed to explore the extent to which students in interprofessional tutorial groups demonstrate constructive collaboration during group discussions.

**Methods**

Students (N=52) from the Medical, Midwifery and Nursing programmes took part in the study. Video-recordings were made of interprofessional PBL discussions (N=40) in five groups, eight videos per group. Over a period of four weeks, participants discussed four scenarios concerned with the reproductive system. The resulting 67 hours of video data were analysed qualitatively. To ensure inter-rater reliability, two tutors assessed the students' constructive, collaborative activities using the Maastricht Peer-Activity Rating Scale (MPARS). Finally, to gain an understanding of students' perceptions of their performance and participation in the interprofessional PBL tutorial, we organized three uni-professional focus groups (FGs) at the end of pilot project.

**Results**

The translated MPARS was reliable (Kappa coefficient 0.01-0.20 and $p < 0.05$). Students were actively involved in the discussion and contributed to a better understanding regardless of their professional background. Group members from different professions complemented one another in solving learning issues. They were open, feeling free to question and argue from the viewpoint of their own profession, and also understood their strengths and limitations. The statistical test of the scores for constructive and collaborative activities indicated a significant difference between students and the various healthcare professionals, $p=0.000$, with medical students scoring highest on both activities. Focus groups further clarified some of the observed dynamics.

**Conclusion**

Implementing interprofessional PBL could motivate students to engage collaboratively in co-constructing knowledge to solve the patients' problem. Medical students scored highest on constructive and collaborative activities.


**Keywords**: Interprofessional problem-based learning, Maastricht Peer-Activity Rating Scale (MPARS).

## INTRODUCTION

Interprofessional collaboration in health care is considered to be a potential solution to reduce clinical error, improve patient safety and enhance the quality of patient care. Previous studies have shown that problems in collaboration and coordination between professionals can negatively affect patient outcomes, lower work satisfaction for professionals, and lead to wasted resources [1-7]. Previous studies report many factors that may prevent effective collaboration among professionals. These include professional factors, such as lack of knowledge about and trust in other professionals' skills and expertise, and lack of understanding of the roles of other professionals [1, 8, 9] as well as external factors, such as professional culture, views, time constraints, problems contacting other professionals, and lack of reimbursement for collaborative work [9, 10].

Training health professional students to work together is recognized as an important step in creating interprofessional collaboration in the clinical workplace. Globally, the WHO supports health professions education to implement interprofessional education (IPE) [11]. IPE brings students from different health professions together to learn with, about and from each other, either in a classroom or a clinical setting [12-14]. IPE has been implemented in various educational formats, such as interprofessional ward-based training [15, 16], case-based discussion [17, 18], clinical simulation [19, 20], e-learning [21], and ambulatory primary care [22]. The key to effective learning in these interprofessional education programmes seems to be student interaction [23, 24]. Therefore, simply conducting shared lectures for students from different healthcare professions is unlikely to foster the attitudes and knowledge conducive to effective interprofessional teamwork [25]. Effective IPE should be interactive, collaborative, reflective, and experiential [26] and should strive to address the power relations and conflict inherent in health professional teamwork [27, 28]

Interprofessional problem-based learning (PBL) is one approach that has been proposed to provide students with the opportunities to develop the necessary skills to work collaboratively with different health professionals [29, 30] and effective learning approach for gaining in knowledge [31]. PBL is experiential, reflective, and intended to be interactive [32]. It provides opportunities to discuss, argue, present and hear one another's viewpoints, thus contributing to the intellectual growth of students [33]. Interprofessional PBL could result in students developing the mutual professional respect and trust that is essential in interprofessional patient-centred practice. Essential for effective PBL is that students actively construct and reconstruct their knowledge in the group by summarizing, asking critical questions and correcting misconceptions [34-37] and that students actively collaborate in the process [38].

To date, research into interprofessional PBL has, among others, explored: student satisfaction while taking part in interprofessional PBL [39, 40], collaborative behaviour within knowledge development [29] interprofessional attitudes pre and post interprofessional PBL [41], and students' perceptions toward interprofessional PBL [31, 42]. However, whether the working ingredients of PBL, such as constructive and collaborative activities, still work when PBL is done within an interprofessional learning setting remains to be evaluated. The literature also reports that status factors and learners' backgrounds affect interactions in small groups and

thus the effectiveness of the group which, accordingly, affects productivity in constructing knowledge [43]. The question is whether PBL is an appropriate learning approach for interprofessional groups of students. Although interprofessional PBL was designed to foster collaborative, active learning skills in students, little is known about how it works in practice. This study aims to further clarify the inner workings of interprofessional PBL [44] and focus on examining constructive and collaborative activities among undergraduates taking part in an interprofessional PBL tutorial.

In order to achieve the aim of this study, we developed the following research questions:

1. To what extent do students in interprofessional PBL groups demonstrate constructive and collaborative activities in the tutorial group discussions?
2. To what extent do these activities differ between students from different professional groups?
3. How do the students reflect on their performance during interprofessional tutorial group discussions?

## METHOD

### Context

In Indonesia, all undergraduate health professions programmes have introduced interprofessional collaboration skills to their core curricula. However, very few Indonesian universities have actually incorporated an IPE programme that facilitates collaborative learning in interprofessional student teams into their curriculum. Universitas Islam Sultan Agung officially implemented IPE in 2017, and since 2012 has conducted several pilot projects on IPE, including interprofessional PBL tutorials and simulations for medical, nursing and midwifery programmes. The objectives of the IPE pilot project were to improve students' ability to collaborate, share and communicate patient information with different professionals as a member of a health care team and to present an appropriate treatment and care plan to address the patient's social, psychological and economic conditions.

Three healthcare education programmes are involved in the IPE pilot project, namely medical, nursing and midwifery programmes. These programmes differ in length and duration of their pre-clinical and clinical phases. While the medical and nursing programmes all have five-year curricula, the midwifery programme spans only three years. The clinical phases start after three and half pre-clinical years (medicine), four years (nursing), and two years (Midwifery). Midwifery and nursing students have early clinical exposure in their pre-clinical phase in the form of two months of midwifery and nursing practice in a hospital or public health centre. Medical students do not have any practical experience in their pre-clinical years other than skills practice in the lab with simulated patients and manikins. Learning in all programmes is uni-professional, meaning that students rarely collaborate with students from other healthcare disciplines, not even during clinical rotations. As a pedagogical approach, PBL has been applied in the curriculum of each program. Therefore, students experience learning collaboratively in the uni-professional setting.

However, they never experience sharing knowledge and expertise with students from another professional background. For the present pilot study, we invited students in their final pre-clinical year of medical, nursing, and midwifery to participate.

## Interprofessional problem-based learning tutorial

Uni-professional PBL tutorials have been applied in the programmes since 2005, so students do not need to learn how to conduct tutorial discussions. The PBL tutorial applied in the health-related programmes of Sultan Agung Islamic University employs seven jump steps [45, 46].

| PBL seven jump steps |
|---|
| Step 1. Identify and clarify unfamiliar terms presented in the scenario; the scribe lists the terms that remain unexplained after the discussion |
| Step 2. Define the problem or problems to be discussed |
| Step 3. Use "brainstorming" to discuss the problem(s), suggesting possible explanations on the basis of prior knowledge; students draw on each other's knowledge and identify areas of incomplete knowledge |
| Step 4. Review steps 2 and 3 and arrange explanations into tentative solutions; the scribe organizes the explanations and restructures if necessary |
| Step 5 Formulate learning objectives; group reaches consensus on the learning objectives |
| Step 6. Private study |
| Step 7. Students identify their learning resources and share the results of private study with group |

Tutorial session 1 (T1), which lasted 100 minutes, started by presenting the groups of students with the problems of clinical scenario. Through the group discussions and using prior knowledge of the content of the scenario, students identified learning issues (steps 1–5). After the discussion, students independently researched the learning issues outside the classroom (step 6). Students were given 3 days for self-directed learning. In this step, students have to study the learning issues related to both their areas of expertise and general medical science. For example, students had to study both the management and pathophysiology of pregnancy bleeding, including (other) risk factors of pregnancy. In tutorial session 2 (T2), which also lasted 100 minutes, the students regrouped to share the results of their self-directed learning (step 7).

Four scenarios (one per week) in the area of the reproductive system provided the topics of discussion. The background of the medical cases was interprofessional health care in a public health centre and the cases were problems that were commonly encountered in rural public health centres. The scenarios were treating: (1) tuberculosis (TB) during pregnancy, (2) vaginal bleeding during pregnancy in a public health setting, (3) hyperemesis gravidarum and (4) normal labour in a public health centre. For learning outcomes of the interprofessional PBL program, see Table 1.

**Table 1.** Learning outcomes

| |
|---|
| Week 1<br>Topic: Tuberculosis in pregnancy<br>After attending the small group discussion tutorial, students were expected to be able to:<br>Explain the signs, symptoms and diagnosis of TB in pregnancy<br>Explain the diagnostic procedure for TB in pregnancy<br>Explain the pharmacodynamics and pharmacokinetics of TB drugs and their side effects for pregnancy<br>Explain the role and responsibility of each profession of the health care team in handling a case of TB in pregnancy in the public health centre. |
| Week 2<br>Topic: Vaginal bleeding<br>After attending the small group discussion tutorial, students were expected to be able to:<br>Determine the scientific basis relevant to the pathophysiological understanding of the occurrence of vaginal bleeding in the third trimester of pregnancy<br>Describe the ethology and risk factors for vaginal bleeding in the third trimester of pregnancy<br>Describe the symptoms, signs, complications and abnormality of vaginal bleeding in the third trimester of pregnancy<br>Explain the differential diagnosis of vaginal bleeding in the third trimester of pregnancy<br>Explain the treatment administered to stop the patient bleeding in a public health centre and what should be done to refer the patient to hospital<br>Explain the role and responsibility of each profession of the health care team in handling vaginal bleeding in the third trimester of pregnancy case in the public health centre. |
| Week 3<br>Topic: Hyperemesis gravidarum<br>After attending the small group discussion tutorial, students were expected to be able to:<br>Explain the signs of emergency in pregnancy<br>Explain how to provide first aid in cases of severe dehydration / hypovolemic shock based on evidence-based medicine<br>Explain the management of hyperemesis gravidarum<br>Explain the role of each health profession in managing emergency cases in a public health centre. |
| Week 4<br>Topic: Normal labour<br>After attending the small group discussion tutorial, students were expected to be able to:<br>Explain the signs of labour<br>Explain the complications of labour<br>Explain the roles and responsibility of health care team members in handling third stage of labour in a public health centre setting<br>Explain the steps of collaboration among health care team members in handling normal labour in a public health centre setting<br>Explain the resuscitation procedure for new-borns. |

## RESEARCH DESIGN

We applied an explanatory, sequential mixed methods design to answer the research questions [47]. First, we collected quantitative data on students' constructive collaborative activities in interprofessional PBL tutorials by observing the video-recordings and filling out a previously inter-rater reliability-checked Maastricht Peer-Activity Rating Scale (MPARS). The results of the scale were then used as input for qualitative data collection, which consisted of uni-professional focus group discussions aimed to understand the underlying reasons for students' perceptions of the interprofessional PBL tutorial. We also explored the students' perception of their own performance of constructive and collaborative activities during the interprofessional PBL tutorial.

## QUANTITATIVE DATA COLLECTION AND ANALYSIS: MPARS

All the tutorial processes were video-recorded. The recorders were set in the corner of the room to minimize any disruption to the participants' behaviour. To analyse the students' behaviour, we recorded 40 interprofessional PBL discussions (eight videos per group), resulting in approximately 67 hours of video data.

To evaluate students' constructive, collaborative and motivational activities, Kamp [48] developed the Maastricht Peer-Activity Rating Scale (MPARS). Containing 14 items, this scale is intended for assessing peer behaviour (constructive, collaborative and motivational activity) by students in uni-professional PBL tutorial discussions. In the present study, two tutors evaluated only the constructive and collaborative activities recorded on the videos of the interprofessional PBL tutorials. The constructive activities scale evaluates skills in co-constructing knowledge, such as summarizing, drawing distinctions between main and side issues, asking critical questions, correcting misconceptions, and contributing to a better understanding of knowledge. The collaborative activities scale evaluates collaborative performance during the discussion, such as a student's influence on group members, their responsibility to the group, their willingness to share information, and their commitment to the group. The MPARS scale was translated by means of a double back translation procedure to assess the consistency between the original and translated versions. This means that an English-Indonesian translator translated the English version of the questionnaire into Bahasa Indonesian, after which another translator translated this version back into English. The instrument uses a five-point Likert scale ranging from (1) completely disagree; (2) disagree; (3) neutral; (4) agree; and (5) completely agree.

MPARS as a peer assessment tool has never been used before in Indonesia, or in any other Asian context. We felt that, as a measuring tool carried out by peers, MPARS; like other peer assessment tools might create too many feelings of discomfort in a cultural setting where saving face and speaking up are not self-evident [49, 50] Considering the characteristics of Asian students who might be biased in conducting peer assessment, in contrast to previous studies

using MPARS, in this study the evaluation of students' performance using MPARS was conducted by tutors rather than by students. Future research needs to explore how MPARS can be used as an effective peer-assessment tool in Asian settings. One of the researchers and a second ratter (junior tutor) assessed the constructive and collaborative activities recorded on videos of the interprofessional PBL tutorial to determine inter-rater reliability of the MPARS scale. Prior to the evaluation, the researchers and ratters agreed on the evaluation items, so no differences in giving scores was expected. The evaluation results were collected and statistically tested with the Kappa test to determine the reliability of each item. The reliability and validity tests were conducted employing SPSS (IBM SPSS Statistic).

Any differences in performing constructive and collaborative activities between students from each profession (medical, nursing and midwifery) were evaluated based on the average MPARS-item score, employing the Kruskal-Wallis test followed by the Mann-Whitney U statistical test.

## QUALITATIVE DATA COLLECTION AND ANALYSIS

### Verbatim transcripts of the tutorial group meetings

To explore students' actual engagement in interprofessional PBL tutorial groups, conversational data of the tutorial sessions were transcribed. The verbatim transcripts were made in Indonesian and coded for content, applying the coding scheme based on Kamp's interaction analysis model [48].

The constructive and collaborative activity was evaluated from the discussion process. For the analysis we selected segments from the discussion of prior knowledge (step 3) in T1 and from sharing the results of self-directed learning (step 7) in T2, as in these steps the students discuss, share, argue, and present knowledge.

## FOCUS GROUPS

To gain a better understanding of students' perceptions of their performance and participation in interprofessional PBL tutorials, we organized three uni-professional focus groups (FGs) at the end of pilot project. We deliberately chose not to mix students from different programmes to overcome potential barriers to communication and to encourage participation in the discussion. The focus group discussions were also video-recorded. A lecturer in community medicine (SY) and a medical educationist (DRA) who understood the concept and aims of the study facilitated the FGs with the aid of a discussion guide [51]. The purpose of this guide is to focus the discussion on the topic to be explored. The discussions were transcribed by an expert, and the verbatim transcript was coded for content without eroding the original content. Two experts in medical

education EL and SY performed the thematic analysis. They independently evaluated the transcripts, first by open coding, and then developed and agreed on the coding categories, which they finally applied to the data. After this process, all members of the research team discussed the findings until they reached consensus. The data were analysed utilizing ATLAS.ti (version 7).

## PARTICIPANTS

Students in their final year medical, nursing and midwifery programmes voluntarily participated in mixed profession tutorial groups consisting of 8-10 students (Table 2).

**Table 2.** Group participants

| Group | Profession of Tutor | Number of Medical students | Number of Nursing students | Number of Midwifery students | Total participants |
|---|---|---|---|---|---|
| Group 1 | Nurse | 3 | 4 | 3 | 10 |
| Group 2 | Nurse | 4 | 4 | 3 | 11 |
| Group 3 | Doctor | 3 | 5 | 3 | 11 |
| Group 4 | Doctor | 3 | 5 | 2 | 10 |
| Group 5 | Midwife/ Doctor | 3 | 4 | 3 | 10 |
| Total | | 16 | 22 | 14 | 52 |

## RESULTS

A total of 52 students from midwifery, nursing and medicine took part in the study (Table 3). Some students were absent for the discussions, particularly in the second, third and fourth weeks, due to other academic or non-academic commitments.

### MPARS inter-rater reliability and validity tests

The Kappa statistical test results indicated that all items had slight agreement with a Kappa coefficient of 0.01-0.20 and $p < 0.05$ (Table 4). The result of validity test indicated that all assessment items were valid to measure students' co-construction and collaboration activities. The coefficient of corrected item-total correlation of all items were higher than 0.266 (correlation coefficient for 52 subjects).

**Table 3.** Demographic characteristics of the participants

| | Midwifery | | Nursing | | Medical | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Gender | | | | | | |
| Male | 0 | 0 | 10 | 45.5 | 6 | 37.5 |
| Female | 14 | 100 | 12 | 54.5 | 10 | 62.5 |
| Admission | | | | | | |
| scholarship | 1 | 7.1 | 0 | 0 | 1 | 6.3 |
| regular test | 13 | 92.9 | 22 | 100 | 15 | 93.7 |
| Decision to study at the program | | | | | | |
| own preference | 14 | 100 | 18 | 81.8 | 14 | 87.5 |
| encouraged by parents | 0 | 0 | 4 | 18.2 | 2 | 12.5 |
| Experience in collaborating with students from other departments | | | | | | |
| Yes | 10 | 71.4 | 12 | 54.5 | 12 | 75 |
| No | 4 | 28.6 | 10 | 45.5 | 4 | 25 |
| | Mean | SD | Mean | SD | Mean | SD |
| Age | 19.8 | 0.63 | 19.8 | 0.42 | 20.2 | 0.66 |
| GPA (max score 4) | 3.14 | 0.39 | 2.98 | 0.26 | 3.3 | 0.48 |

**Table 4.** Inter-rater reliability of MPARS

| | | Reliability | | Validity |
|---|---|---|---|---|
| No | Constructive activity | Kappa | P | **corrected item- total correlation** |
| 1 | Students were able to make adequate summaries | 0.147 | 0.000 | 0.85 |
| 2 | Students were able to make a distinction between the main and side issues in the subject matter | 0.157 | 0.000 | 0.77 |
| 3 | Students asked critical questions | 0.078 | 0.020 | 0.77 |
| 4 | Students corrected misconceptions about the subject matter | 0.156 | 0.000 | 0.78 |
| 5 | Students contributed to a better understanding of the subject Collaborative activity | 0.094 | 0.026 | 0.72 |
| 6 | Students had a positive influence on the group | 0.154 | 0.000 | 0.83 |
| 7 | Students felt responsible for the group | 0.108 | 0.000 | 0.75 |
| 8 | Students promoted collaboration between group members | 0.057 | 0.018 | 0.65 |
| 9 | Students were willing to share their information | 0.179 | 0.000 | 0.84 |
| 10 | Students were committed to the group | 0.046 | 0.047 | 0.71 |

## Constructive activities

Results indicated that medical students performed better on constructive activities than midwifery and nursing students. The result of the Kruskal-Wallis statistical test on all items of constructive activities indicated a significant difference in the constructive scores of students from different healthcare professions, p=0.000 (Table 5).

**Table 5.** Constructive activities

| Items | Midwifery | | Nursing | | Medical | | p Kruskal-Wallis |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | |
| **Constructive activity** | | | | | | | |
| Students were able to make adequate summaries | 2.48 | 0.48 | 2.59 | 0.55 | 3.22 | 0.39 | 0.000 |
| Students were able to make a distinction between the main and side issues in the subject matter | 2.94 | 0.53 | 2.89 | 0.50 | 3.22 | 0.31 | 0.000 |
| Students asked critical questions | 2.66 | 0.63 | 2.59 | 0.43 | 3.05 | 0.40 | 0.000 |
| Students corrected misconceptions about the subject matter | 2.62 | 0.54 | 2.59 | 0.43 | 3.05 | 0.40 | 0.000 |
| Students contributed to a better understanding of the subject | 2.69 | 0.53 | 2.89 | 0.57 | 3.43 | 0.39 | 0.000 |

Mann-Whitney testing between each of the two groups indicated that for all scale items, the score of midwifery and nursing students was not significantly different ($p > 0.05$). Meanwhile, in all assessed items, there was a significant difference in the scores of medical students with that of midwifery students and nursing students ($p < 0.05$).

Based on the analysis of the videos and transcripts of the tutorial group meetings, students were actively involved in the discussion and contributed to a better understanding regardless of their professional background. However, depending on the topic, we saw differences in the extent to which different groups of students engaged. Medical students contributed the most in the discussion of physiology, pathophysiology and clinical reasoning to decide on a diagnosis or a differential diagnosis but less in management. Midwifery students also contributed to elaborating knowledge of physiology, pathophysiology, specifically pregnancy, and they were best in explaining the management and treatment for normal pregnancy, but they participated less in patient management other than normal pregnancy. Meanwhile, nursing students were very active in elaborating information when the topic concerned practical management and treatment of the patient, but were less active in the discussion of physiology, pathophysiology and clinical reasoning to decide a diagnose or a differential diagnose. Group members who did not answer questions or explain knowledge became active listeners. This could be observed

from the fact that they paid close attention to the other group members' conversation, asked clarifying and probing questions, added further information, rephrased or summarized to check their understanding, and waited until a group member had done speaking before responding.

Quotes from discussions:

> *"In the case of inducing labour when the fetal heart rate is abnormal, we usually administer oxygen by mask and lay the mother on her side." (Midwifery student 3)*
>
> *"Why she should be treated with oxygen and laid on her side?" (Nursing student 5)*
>
> *"When she's lying on her side, I think it's easier for the nutrients to enter the fetus." (Midwifery student 3)*
>
> *"It just has to do with technique."(Midwifery student 1)*
>
> *"I learned there are a few possible labour positions. One of them is lying on her side. The mother lies on her left or right side with one leg raised, and the other leg straight… The benefit of this position is that it reduces pain in the waist, helps lower high blood pressure, and accelerates the labour process. This position makes the blood delivery from mother to fetus run well through the placenta and then labour is more comfortable."(Medical student 4)*

## Collaborative activities

The result of the Kruskal-Wallis statistical test for all items on collaborative activities indicated a significant difference between the MPAR scores of students from different healthcare professions, $p=0.000$. The Mann-Whitney test between each group pointed out that for all scale items, the mean rank scores of midwifery and nursing students were not significantly different ($p> 0.05$). Meanwhile, in all assessed items, there was a significant difference in the mean score of medical students with that of midwifery students and nursing students ($p <0.05$) (Table 6).

**Table 6.** Collaborative activities

| Items | Midwifery | | Nursing | | Medical | | p Kruskal-Wallis |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | |
| **Collaborative activity** | | | | | | | |
| Students had a positive influence on the group | 3.12 | 0.39 | 3.22 | 0.5 | 3.54 | 0.34 | 0.000 |
| Students felt responsible for the group | 3.35 | 0.53 | 3.47 | 0.48 | 3.66 | 0.25 | 0.002 |
| Students promoted collaboration with group members | 3.37 | 0.29 | 3.42 | 0.40 | 3.64 | 0.31 | 0.000 |
| Students were willing to share their information | 3.11 | 0.55 | 3.11 | 0.52 | 3.68 | 0.28 | 0.000 |
| Students were committed to the group | 3.37 | 0.49 | 3.24 | 0.38 | 3.64 | 0.24 | 0.000 |

Students encouraged and facilitated one another when they discussed the learning issues. Group members from different professions complemented others in answering learning issues. They were open to each other, feeling free to ask and argue their professional viewpoints, and also understood their limitations and strengths. In addition, the role of group leader switched from profession to profession. The leader stimulated shared responsibility for the learning in the tutorial groups and helped the discussion run smoothly.

Collaboration was also apparent when students in one group of various professionals helped one another find answers and solve problems instigated by the tutors' critical questions.

> *"… It's important to know that pregnant women get the same TB treatment as other TB patients. Pregnant women can take rifampicin, isoniazid, ethambutol, and pyrazinamide all safely. There are indeed side effects of the drugs, both mild and severe…." (Medical student 1)*
>
> *"Pregnant and non-pregnant women get the same treatment?" (Tutor)*
>
> *"… Except for streptomycin … Pregnant women should not be given streptomycin because of its ototoxicity. It causes calcium levels to drop in the blood and extreme loss of body water so it's harmful to the fetus." (Medical student 1)*
>
> *"That's for category 1 and 2 so this combination is for two-month treatment. After that the patient should undergo another sputum smear." (Nursing student 4)*

The above example of collaboration indicates that conflict on conceptual knowledge can be resolved collaboratively among professions.

## Qualitative findings

To address the research question 'how do the students reflect on their performance during interprofessional tutorial group discussions?' and to allow for a better understanding of the interprofessional PBL process, we organized uni-professional focus groups. Five main themes were identified, specifically: 1) Students learned from each other professions' knowledge, 2) asking critical questions is not always self-evident 3) correcting misunderstandings without causing offence 4) Factor affecting students' participation, 5) persisting professional barriers.

1. **Students learned from each other professions' knowledge.**
   During the focus group discussions, students said that they benefitted from the differences in the knowledge of each professional group, and that they were able to both provide and gain knowledge. Furthermore, it helped them understand the limitations of their own profession.

> *"It's good to meet students from different programmes. I learned a lot from other professions, like I learned the steps to handle emergency patients from the nursing students."*
> *(Medical student 3)*
>
> *"I learned how to apply clinical reasoning to diagnose patients from medical students"*
> *(Nursing student 2)*

Interestingly, the students discussed not only medically related topics, such as physiology, pathophysiology, diagnosis, and management but also the roles and responsibilities of each profession related to the cases. This enabled the students to learn about the boundaries between roles and also the limitations of their own role.

> *"In IPE we learned what role each profession must play in collaborative healthcare. It's important so that responsibility can be shared and the patient can be treated quickly and correctly" (Nursing student 4)*

2. **Asking critical questions is not always self-evident**
   Some students asked critical questions, usually to broaden understanding or deepen the topic. Nevertheless, the posing of critical questions was strongly influenced by the role of the tutor who usually asked critical questions to challenge students and stimulate deep learning. However, in groups with a very dominant tutor, this person mostly posed the critical questions which consequently reduced the students' role in such constructive learning activities as searching for links between topics and understanding mechanisms/theories by themselves. As a result, students tended to rely on the tutor's questions to develop the concept.

***"Can a dead baby possibly be delivered spontaneously?" (Tutor)***

*"Do you mean the mother does not know that the baby has passed away?" (Midwifery student 5)*

***"Yes. Dead for months, for example. Can it still be delivered spontaneously?" (Tutor)***

*"I think the baby can be delivered spontaneously after it dies, but not [when it is dead] for as long as months, like you said." (Medical Student 2)*

***"Have you ever heard of abortion?" (Tutor)***

*"Yes" (All students)*

*"W**hat are the complications of abortion?" (Tutor)***

Some students explained that asking questions was not nice for classmates, as the classmates then had to give further explanation and elaborate on the concept that they were trying to explain to the class. Asking questions should be avoided to maintain a conducive and comfortable discussion situation.

*"We loved adding information rather than asking for further explanation. We do that in uni-professional tutorial as well. It's common for us students… asking questions means challenging our mates to explain. It's putting a burden on them." (Medical student 6)*

*"…we understand that asking 'further questions or for clarification' will broaden our knowledge and understanding, but as my friend said, it burdens our mates and gives them problems. That's why we try to avoid it. We let our tutor ask the critical questions and bring those questions to the table so that all students are responsible for answering collaboratively." (Medical student 2)*

Students pointed out that asking critical questions was also regarded as creating conflict, which would arise when students held different points of view. In that situation, it was apparent that students would come to a quick consensus and agree to avoid the inconvenient situation caused by differences.

*"Critical questions will only produce new problem to discuss, and will sometimes create conflict. We don't like conflict. We love doing smooth discussion. That [avoiding conflict] makes us feel comfortable in the small group discussion." (Midwifery student 1)*

*"Difference of opinion happens sometimes, but we don't want to make it worse. For me, I'd rather accept another professional's opinion, understand their point of view and try to compromise on the difference." (Medical student 5)*

Moreover, the analysis of students' activity during interprofessional tutorials indicated that the group leaders, students who could be from any profession, generally drew the conclusions of the discussion. Some groups drew no conclusions and the chair simply asked the group members whether all had understood and agreed with the discussion content. When all participants agreed with the explanation, the discussion continued on to the next topic. When we explored this phenomenon later on, the focus group students explained that it was common practice: if all the explanations were clear and there were no differences in opinion, then they would immediately agree and just go on to the next question.

*"When there are no conflicting views and all the explanation are clear and we agree with them, then don't think we need to sum up." (Nursing student 2)*

3. **Correcting misunderstandings without causing offence**
   Correcting misunderstandings of the concept also occurred during interprofessional discussion. The interesting thing was that students tended to correct misunderstandings in students from other professions indirectly, in a polite manner, for example by quoting information from a learning resource they had read, rather than expressing direct disapproval [criticism].

*"OK, let's expand the topic... If the fetus died in the womb, what should the health care team do?" (Tutor)*

*"C-section?" (Nursing student 3)*

*"Induction?" (Midwifery student 1)*

*"Do you mean per vagina?" (Tutor)*

*"If the fetus dies in the womb, it will come out by itself as the fetus will be considered a foreign body by the pregnant body." (Midwifery student 2)*

*"I read in Achdiat 2004 that there are several ways to manage fetal death in the womb. Dilation or curettage can be administered for pregnancy less than 12 weeks gestation. For pregnancy over 12 weeks…" (Medical student 4)*

The focus group students explained that correcting misconceptions by providing information from learning resources was done to avoid causing offence to another group member.

> *"It also happens with correcting mistakes. We correct misunderstandings in other profession students politely, by providing another perspective from medical resources. So we don't say directly that the other person's opinion is wrong. We try to be as polite as possible so that others won't be offended. I don't want to let other students in the other professions think that we, the medical students, are more powerful than them." (Medical student 3)*

**4. Factors affecting students' participation**

a. **The role of tutor**

Some students in the focus group clarified the strong role of the tutor in constructive learning activities and mention that tutors were too active. However, some students said that they appreciated the tutor taking an active role.

> *"Our tutor is so active. She asks a lot. But I think it's good because it can expand the topic of discussion." (Midwifery student 3)*

b. **Social status**

Another factor hampering constructive learning was the difference in social status of the health profession groups. According to the students, 'inequality' made them reluctant to criticize opinions and pose critical questions to other students.

> *"Sometimes we feel too uncomfortable to ask [questions]. Embarrassed, I feel like I lack knowledge, especially [compared] to medical students." (Midwifery student 5)*

**5. Persisting professional barriers**

We observed an interesting phenomenon with regard to students' collaborative behaviour. Despite collaborating solidly in their interactions for several weeks, we still found professional barriers up until the last week of meetings. For example, students still clustered physically in accordance with their profession; especially midwifery students. When this was explored during the focus group, students said that the problem was closely related to confidence. Students felt secure when sitting beside a friend from the same profession so that they could discuss the answer to a problem based on their shared background of professional knowledge. Some students felt that the interprofessional class was quite stressful, because they had to maintain professional pride.

Below are some quotes from the focus group discussion that indicating insecurity during interprofessional PBL.

*"Yes… we always sit beside each other. We feel confident, and feel that we can support each other if we sit side by side. So, if we have problem, we can negotiate with the others according to our scientific background." (Midwifery student 2)*

*"Sitting next to a student from the same background made us feel safe. The discussion was so tough for us, it forced us to struggle to do our best because we had to uphold the pride of our profession." (Nursing student 4)*

## DISCUSSION

Using a mixed method design we set out to study how students engage in constructive collaboration in interprofessional PBL tutorial meetings, how the performance of each professional group differed and how students motivated their performance during the tutorials. Based on the observations of the tutorials and using the MPARS, two researchers rated the students to distinguish those who very actively contributed to construct knowledge regardless of their professional background. These students collaborated on developing knowledge and complemented one another in answering the learning issues. They shared knowledge and learned about one another's professions, including the role boundaries and limitations. These findings suggest that the PBL approach meets the aims of IPE – to experience the perspectives held by others, to listen to the way they talk about their tasks and competencies and to construct knowledge in collaboration with one another [42, 52, 53]. Students were observed to correct each other's misconceptions. Very encouraging was the fact that corrections were voiced politely in non-confrontational language, indicating respect for the fellow student and potentially the other's profession. These findings resonate with previously reported studies which describe that interprofessional PBL could inculcate respect for other professions and appreciation of the roles and knowledge of others [32, 54].

Our findings provide examples of collaborative interprofessional practice when it comes to solving the patients' problem. Interestingly, conflict on conceptual knowledge can be elaborated collaboratively among the professions. Others have demonstrated how collaboration in PBL might have favourable outcomes for IPE because it helps in creating a more positive attitude towards other professional groups and improving interprofessional relations [32, 41, 42, 52, 55] In addition to these promising findings, our results show that students often try to avoid conflicts in the discussion or, when conflicts arise, they accept sketchy arguments and conclude the discussion quickly. This could be problematic, as learning to cope with uncertainty is an essential goal in PBL and the ability to avoid hasty conclusions in uncertain situations is vital for future clinical practice [56]. However, these phenomena are also observed in uni-professional PBL [57]. Our findings imply that students' discussion skills need to be enhanced, such as the skills required

to bring out differences in each other's conceptual thinking, to develop deep argumentation and to produce questions that elicit elaboration. The tutors' ability to facilitate collaborative resolution of conflicts in the interprofessional tutorial should be improved.

It was also found that midwifery and nursing students scored between poor and average on their constructive activities lower than medical students' scores, pointing to unequal participation in the PBL sessions. Medical students also scored higher on their collaborative activities. The focus group findings shed light on factors hindering equal participation, such as cultural aspects, the students' perception of hierarchy in the field of health services, and lack of self-confidence.

The role of cultural practices in relation to the success of PBL has been previously described [29, 58]. Active learning techniques, such as the PBL tutorial, have gained popularity at medical schools in western countries. However, there are problems to be faced in executing the method, particularly among Asian students who are used to gaining knowledge passively through didactic lectures, being spoon-fed and memorizing knowledge without criticizing it. The successful application of the PBL methods in Asian schools is impeded by different cultural practices, such as the students' lack of confidence in sharing their opinions, reluctance to criticize and share a different point of view and their preference for classic, didactic lectures and memorizing facts rather than extracting problems from the cases by themselves [59, 60]. As a result, the benefits of PBL designed to train students to argue, criticize and co-construct knowledge are less than optimally achievable [61, 62]. Our findings indicate that critical questions were seldom asked during the discussions. This could be caused by a combination of cultural and interprofessional factors. The resulting dominance of the tutor in these cases has also been previously reported [58, 63]. Facilitating IPE is complex and demanding, which makes the faculty development of tutors in an IPE setting critical [64-66].

Lessons to be learned from this research are that students from various professions can benefit from PBL interprofessional activities, such as being able to collaborate in constructing knowledge and practicing communicating with other professions. Also, interprofessional PBL could teach the student the importance of respecting and fostering respect for the roles of other professions, taking advantage of working in a team to tackle complex, difficult problems and discussing a patient-centred approach to care. This finding was in accordance with previous research which explored students' perception regarding interprofessional education and reported that students were favourable to IPE [67]. However, in this study, interprofessional PBL did not succeed in creating more equality in the process as medical students were better at constructive and collaborative activities. This seems to be a result of the interplay between various complex factors, such as the influence of the Asian cultures that tend to be hierarchical and place doctors in higher positions in society, and problems with self-confidence and the students' learning preferences. Considering these findings, it is suggested that PBL should not be the only learning approach applied for IPE. It can be as useful starting point for students from different professions in the pre-clinical year phase to interact in IPE, but then it should be followed by simulation and work-based learning approaches. The recent study by Paradis & Whitehead also suggests that

interprofessional training only makes sense when applying practices in the workplace [28].
This study contributes to literature as it provides pedagogical implication through examining students' actual performance and reflection on their participation in interprofessional PBL. The limitation of this study was that it was a small pilot project with a relatively small group of participants from three programs only. They might not represent the performance and perceptions of all Indonesian healthcare professional students. Moreover, students participating were volunteers so they may have had a stronger interest in experiencing IPE. Future research should include explorational and observational designs to study students' performances within interprofessional PBL among large numbers of students.

## CONCLUSION

Implementing interprofessional PBL could motivate students to engage in the co-construction of knowledge and other collaborative activities to solve patients' problems. However, because PBL is influenced by national and professional cultures, implementing PBL alone is probably not enough to achieve all the IPE goals. In the Asian context, we suggest that PBL should be followed by other learning approaches in the continuum of study in the professional health care curriculum. There was evidence from this study that MPARS was valid and reliable instrument to evaluate students' constructive and collaborative activities during interprofessional PBL. Further research could implement the MPARS as a peer-assessment tool and help improve the tutorial group process.

**Abbreviations**
FG = Focus group; FGD = Focus group discussion; GPA = Grade point average; IPE = Interprofessional education, MPARS = Maastricht Peer-Activity Rating Scale; KMO = Kaiser-Meyer-Olkin

**Availability of data and materials**
Materials and supporting data are available for download on the website:
https://drive.google.com/drive/folders/1iTTTzCAJnXDKdrKHVWv7ZA2pOKtryRAb All files may be used for research and education without further consent.

**Ethics approval and consent to participate**
Ethics approval and consent to participate in the study was approved by the Bioethics Committee for Medical/Health Research Faculty of Medicine Islamic University of Sultan Agung Semarang (Letter No. 290/XII/2013/Komisi Bioetik) and was conducted at Sultan Agung Islamic University, Semarang, Indonesia. Taking part in the study posed no physical risk to participants. The research team sent the research proposal and ethical clearance to the directors of health profession

education programmes in the university and asked for their help to announce the programme to students. Those interested in joining the programme could contact the research team. The team explained the project to the interested students, the goals and benefits of the project and the students' responsibility on joining the project. Those who agreed to join had to fill in a consent form. Tutors with more than two years' experience were recruited from various disciplines. Their participation in the project was also voluntary.

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CHAPTER 5

# STIMULATING STUDENTS' INTERPROFESSIONAL TEAMWORK SKILLS THROUGH COMMUNITY-BASED EDUCATION: A MIXED METHODS EVALUATION

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## ABSTRACT

**Background**

Interprofessional education (IPE) is suggested as a good means to prepare future healthcare professionals for collaborative work in interprofessional teams enabling them to solve complex health problems. Previous studies have advocated experiential IPE, including community-based IPE (CBIPE). This study aims to evaluate a CBIPE programme by exploring the students' perception toward CBIPE design and toward groups' teamwork.

**Methods**

To identify students' perceptions of teamwork, the Interprofessional Teamwork Evaluation (ITE) questionnaire was administered to 254 students of medical, nursing and midwifery programme. Three uni-professional focus group (FG) discussions were conducted to analyse the students' perception of the design of community-based education and underlying reasons for teamwork.

**Results**

Medical students' scores for interprofessional teamwork were higher than the scores of midwifery and nursing students. The findings revealed significant differences in students' ITE mean rank scores on all items in subscale "communication and mutual support", with the scores of midwifery students the lowest compared to the nursing and medical students. FGs reported three aspects that influence skills development in collaborative practice among students that shed light on why midwifery and nursing students held less positive perceptions of communication and mutual support: (1) communication gap due to lack of confidence, (2) contrasting ways of thinking affect communication in decision making, and (3) the leadership culture in the health services.

**Conclusion**

A CBIPE programme was successfully implemented at Universitas Islam Sultan Agung. It demonstrated that students in the health professions can develop skills in collaborative practice despite having some problems with communication and mutual support.



**Keywords**

Community-based interprofessional education, Interprofessional education, Interprofessional timework evaluation

## INTRODUCTION

The increasing complexity of healthcare issues demands collaboration between various health care professions [1-3]. However, it has been demonstrated that conducting collaborative care is not always self-evident and sometimes negatively influences patient safety and efforts to prevent health problems in the community [4-8].

To better prepare future healthcare professionals for collaborative work in interprofessional teams, implementation of interprofessional education (IPE) in health professions education has been suggested [9, 10]. IPE in health care takes place when two or more health care professions learn about, from, and with each other with collaboration and improved health outcome as the end objectives [11].

Future collaboration can be further enhanced by providing healthcare students from various professions with opportunities to actively learn and interact together [12]. However, IPE formats situated in the classroom alone seem not always sufficient to develop some of the skills needed for collaborative health care [13-15]. Consequently, the scope of IPE initiatives needs to be broadened [16]. Several authors advocate for experiential IPE situated in practice-based settings [17-19]

Community-based education (CBE) is suggested as a model for facilitating IPE in collaborative skills in the workplace [20-22]. CBE is defined as learning activities that use the community extensively as a learning environment, in which not only students but also teachers, members of the community, and representatives of other sectors are actively engaged throughout the educational experience [23]. Community-based IPE (CBIPE) is the process by which a group of two or more students from different health-related occupations with different educational backgrounds learn together while utilising the community as a learning environment, with collaboration and interaction as part of their learning goals [24]. CBIPE students learn in the context of the community itself and are expected to work collaboratively in interprofessional teams to provide an expected health service despite limited resources [21]. CBIPE programmes may also produce the added benefit of exposing students to concepts that might not be accounted for, or explicitly taught, in all health profession curricula, especially those dealing with family medicine, primary care, social determinants of health and cultural competence [25, 26]. Moreover, CBIPE helps stimulate social accountability in health profession students [27]. Various approaches to CBIPE have been previously reported such as learning in rural and primary healthcare settings [24, 28, 29] community-based learning within broader community context [16, 22, 30] and for specific community context; the commonly used model of CBIPE in the western countries [21, 31-35]. The nature of interprofessional learning activities is mainly to provide healthcare services in primary healthcare setting, not in the community. Examples of CBIPE in specific community contexts have been limited to specific setting like senior housing [32] or in child healthcare setting [34]. To enable students to acquire comprehensive skills ranging from diagnosing health problems in the community, to formulating and implementing the

problem-solving activities, [20, 22] designing CBIPE program programme providing those learning opportunities needed to be designed.

Although CBIPE programmes have been implemented globally, there seem to be few reports on the implementation itself and result of these programmes in Asian contexts [21, 24, 36, 37]. Understanding the transferability of CBIPE in an Asian context might be especially important given the great need for interprofessional collaboration in this region [38]. As most Asian countries, Indonesia has to deal with health problems of a very large and diverse population with different races, culture, ethnicities, religions, social strata, education and with relatively few resources for integrated community care system [39]. Understanding what is needed for effective implement CBIPE in an Asian context could therefore have potential to improve future health practice. Moreover, healthcare setting in Asian is unique as it is influenced by strong culture of social hierarchy in the community. Although healthcare teams are often characterized by issues of hierarchy and power [40, 41] these issues are exacerbated in Asian settings. Status in Asian culture is a pervasive organizing principle in all social relationships and is based on such criteria as family background, age, education level and professional rank [39]. Regarding professional rank and educational level, doctors in Asian society are considered to have a high status compared to other health professionals such as nurses, midwives and so on. The Asian culture of status reported complicates effective interprofessional communication, teamwork and collaboration in healthcare teams, [42-45], as the communication style applied is commonly paternalistic or one directional; which reflect doctor's sense of superiority to the other healthcare professionals; rather than partnership style; which can be found in western context and reflect a culture with more bigger sense of 'equity' [42, 46].

This study aims to evaluate the design of a CBIPE project implemented in an Indonesian university. As interprofessional collaboration is the main goal of IPE and teamwork is known to be an important aspect influencing collaboration [47], this study addresses the following research questions:

1. How do students perceive teamwork during CBIPE?
2. How do students' experience the design of the CBIPE programme?

## CONTEXT

### Community health services in Indonesia

Community healthcare centres are at the forefront of public health services in Indonesia. They have the main task of improving the quality of health through community health development programmes and basic health services that involve community members. Each community health care centre serves 30,000–50,000 residents or a sub-district, with a population of 10,000–20,000, that has one community health care centre. In providing health services, if the community

health care centre receives or treats cases of emergency or non-emergency (chronic illness) but the available health workers do not have the authority or are unable to provide certain medical treatment or supporting health services that are needed by patients, they must refer these patients to more capable health facilities, such as public/private hospitals. Thus, the referral system is based on medical indication, rather than patient request.

As the faced health problems are increasingly complex, health workers from various professions in community healthcare centres must work together. They must not only provide basic health care services but also diagnose health problems that exist in the community and provide appropriate interventions for respective problems by providing preventive programmes that involve community members. As these duties are the responsibility of health workers, students following health professional education must gain experience in them.

## IPE at Universitas Islam Sultan Agung

Universitas Islam Sultan Agung began an IPE project in 2013. Since 2016, students in medicine, nursing, and midwifery have been participating in the IPE curriculum, which is spread over several semesters, starting in the 2nd year. During their pre-clinical year (50 hours), the main learning approaches are Interprofessional Problem-Based Learning tutorials and interprofessional clinical skill simulation training in the form of integrated patient management.

## Previous community-based experience of participants

Before participating in CBIPE, all students from the three health programmes involved had previous experience in uni-professional CBE. Medical students had experienced conducting one community health survey and providing health education for the community on three occasions. Midwifery students had visited clients at home, with each student visiting three families on average, with two visits per patient. In addition, midwifery students had been apprenticed at rural midwifery clinics and Public Health Centres for 8–9 weeks, providing primary care services. Nursing students would have been immersed in primary health care at Public Health Centres, including 1 month of conducting home visits.

## Community-based interprofessional education

In 2016, CBIPE was introduced for clinical-year medical and nursing students and final-year pre-clinical phase midwifery students who were taking clinical rotations in Community Medicine. The Sultan Agung Community-Based Interprofessional Education (SACBIPE) programme starts with

one-week training course for all participants in the form of lectures, discussions and simulations on topics such as the ethics of conducting surveys, interprofessional collaboration, cultural problems in health care and so forth. After this course, students are divided into groups of seven containing 2–3 medical and nursing students and two midwifery students. All groups are distributed in several villages in the District of Genuk, Semarang, Indonesia. Each group is responsible for a neighbourhood, normally consisting of 25–30 families with 3–8 members per family.

Students spend 2 weeks in the community, working on CBIPE activities as designed in the SACBIPE programme. They conduct a community health-problem survey, analysing the data to diagnose primary community health problems and determining and implementing interventions for the respective problems.

Students present the findings of their data collection and analysis as well as intervention proposals to a forum attended by the field supervisors of all programmes, the head or staff from the local public health centre and community leaders. The proposed intervention can be in the form of counselling and education for the community, collaboration with the community on disease prevention, training voluntary community health workers in certain topics, home visits for family education, and so forth. At this stage, students must be able to identify the roles and responsibility of each profession and share the task based on their role and authority. When students find an overlap of the task between professions, they discuss giving the task to the more competent profession or they will accomplish the task together. Types of activities, content and schedules of interventions proposed by the group must be discussed in advance with the group's field supervisor. Coming from various health professions, the field supervisors and health professionals in charge of community healthcare service in the area, such as village midwives or nurses, assist the team of students in implementing the interventions.

At the end of the programme the students reflect on all the conducted processes. During this step, students not only discuss the project, but also reflect on the interprofessional collaboration. Students might describe what they have accomplished, their limitations, and their thoughts for future recommendation. Facilitated by the field supervisor, the reflections are done in the interprofessional group, whose members collaborate on writing the reflection report (Figure 1).

## Methods

The current study to evaluate students' experiences with CBIPE and their collaborative skills was conducted in 2017–2018. A total of 254 students (109 medical students, 61 midwifery students and 84 nursing students) had participated in two terms of SACBIPE.

## Research design

We applied an explanatory, sequential mixed methods design to answer the research questions [48]. We first collected quantitative data on students' self-perceived teamwork performance during the SACBIPE programme with the Interprofessional Teamwork Evaluation [47]. The results of the scale were then used as input for qualitative data collection, consisting of uni-professional focus group (FG) discussions aimed at understanding the underlying reasons for students' perceptions of teamwork and collaborative performance. Students' perception of the CBIPE programme was also probed during the focus groups.

## Quantitative data collection

Students' perceptions of teamwork were assessed with Interprofessional Teamwork Evaluation [47] which was adapted from the Teamwork Perception Questionnaire developed by TeamSTEPPS [49]. The Interprofessional Teamwork Evaluation consists of 23 items divided into four subscales: team structure, leadership, situation monitoring, mutual support and communication. All items were assessed on a 1–5 Likert scale, from strongly disagree to strongly agree. The Indonesian version of the Interprofessional Teamwork Evaluation had not been validated. Double-back translation by two language experts was applied in translating the questionnaire.

## Quantitative data analysis

Factor analysis was used to explore the construct validity of the Indonesian version of the questionnaire, and Cronbach's alpha was calculated to determine internal consistency using SPSS (version 20; IBM Corporation, Armonk, NY, USA). The Cronbach's alpha was acceptable if it was >0.7. Suitability of the correlation matrix was determined by the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. The KMO score was considered good and applicable if it was >0.7 and Bartlett's test of sphericity was significant with $P<0.05$. The numbers of factors retained for the initial solutions and entered into the rotation were determined with Kaiser's criterion (eigenvalues >1). Initial factor extraction was performed using principal component analysis. Finally, we performed an exploratory factor analysis using Promax rotation to define the clearer structure. Kruskal-Wallis and Mann-Whitney U statistical analyses using IBM SPSS (version 20; IBM Corporation, Armonk, NY, USA) were applied to evaluate the mean rank difference of total scores and subscale scores among subjects since the data were not normally distributed.

## Qualitative data collection

To gain a better understanding of the students' perception of interprofessional teamwork and collaboration performance, we organised three uni-professional focus groups. We deliberately chose not to mix students from different programmes to overcome potential barriers to communication and to encourage participation in the discussion [50]. FG participation was voluntary. Students were invited to participate in FGs during the wrap-up session. Eight midwifery students, ten nursing students and ten medical students took parts. Lecturers in community medicine (AL and SY) who understood the concept and aims of the study facilitated the FGs with the aid of a discussion guide [51]. The two facilitators took turns being the discussion facilitator because they had to handle three focus group discussions. When one was on duty, the other was observing. There was no power relationship between facilitators and students because the facilitators were not the CBIPE field supervisors. The FG guide included the following questions for students: (a) what is your perception of the design of the SACBIPE, (b) what needs to be improved in the SACBIPE, (c) what is your perception of the interprofessional teamwork and collaboration during the programme, (d) why did they score certain items on the questionnaire low or high? All FGs were tape recorded and transcribed verbatim by two experts in medical education.

## Qualitative data analysis

The verbatim transcripts were coded and analysed by two experts (author EL and SY), who independently evaluated the transcripts and developed coding categories. Afterward, they discussed the coding categories and agreed on the coding, which they finally applied to the data. After this process, all members of the research team discussed the findings up to the point of consensus on the overarching themes. For the thematic content analysis, ATLAS.Ti (version 7; ATLAS.ti Scientific Software Development GmbH, Berlin, Germany) was used.

## Ethics

The study complied with the Declaration of Helsinki and was approved by the Bioethics Committee for Medical/ Health Research Faculty of Medicine Islamic University of Sultan Agung Semarang (Letter No. 352/XII/2016/Komisi Bioetik) and was conducted at Universitas Islam Sultan Agung, Semarang, Indonesia. Taking part in the study posed no physical risks to participants. A cover letter explaining the study's goal and confidentiality accompanied the questionnaire. Written informed consent obtained from participants included information concerning reproducing their responses. All students were informed that this project was part of an

evaluation of the programme, that participation was voluntary and refusal to join the study would have no consequences. Consent was implied by the fact that students completed the questionnaire and took part voluntarily in the FGs. To ensure confidentiality we anonymised both the questionnaires and the transcripts of the FG interviews.

## RESULTS

### Evaluation of the SACBIPE programme

The SACBIPE programme was evaluated in focus group discussions. FGs were conducted with 26 voluntary participants from midwifery, nursing, medical programmes (Table 1). The findings indicate that students felt they benefited from the programme. Students enjoyed problem-solving and practising in real settings as they were interested in active learning. Students reported that by working together as a team in the community, they improved their 'soft' skills, such as communication, leadership, conflict management, leadership and collaboration. The CBE format also helped students develop their skills in decision making, planning and role sharing.

Table 1. Characteristics of uni-professional FG participants

| | Midwifery | | Nursing | | Medical | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Gender | | | | | | |
| Male | 0 | 0 | 6 | 60.0 | 3 | 30.0 |
| Female | 8 | 100 | 4 | 40.0 | 7 | 70.0 |
| | Mean | SD | Mean | SD | Mean | SD |
| Age | 19.2 | 0.7 | 19.8 | 0.35 | 20.4 | 0.52 |

Students said that they experienced identifying their own and other professions' roles and the boundaries between them.

> *"Discussing community problems with other health professional students was interesting. We had to discuss the problem, decide on possible interventions to solve it, schedule activities and share tasks among team members. Conflicts were discussed in the group. I think this was good practice for us to improve our collaboration skills." (Nursing student 3)*

Students felt a stronger need to truly collaborate in the community-based interprofessional education activities, something which the interprofessional PBL they had previously experienced did not afford them.

> *"Community-based IPE benefits us more than just PBL discussion in class, like we did in the pre-clinical phase. In this community-based IPE, we faced a real problem, not a scenario, that required us to collaborate and work together, and share roles in evaluating and solving the community health problem." (Medical student 6)*

Students identified assessment of SACBIPE as in need of improvement. In the current design of SACBIPE, assessments are conducted by field supervisors and health professionals from the public health centre. Students suggested that it would be much fairer if assessments were also carried out by the community, such as family members who are visited or by voluntary community health workers who always collaborate with students in every intervention activity.

## Quantitative findings

Students' perception of teamwork was evaluated with the Interprofessional Teamwork Scale. Of the 254 participants, 210 filled in the questionnaire completely (82.7%), 57 midwifery, 69 nursing, and 84 medical students (Table 2).

**Table 2.** Characteristics of subjects

| | Midwifery | | Nursing | | Medical | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Gender | | | | | | |
| Male | 0 | 0 | 27 | 39.1 | 36 | 42.9 |
| Female | 57 | 100 | 42 | 60.9 | 48 | 57.1 |
| Experience of working with students from other study programmes | | | | | | |
| Yes | 41 | 71.9 | 51 | 73.9 | 45 | 53.6 |
| No | 16 | 28.1 | 18 | 26.1 | 39 | 46.4 |
| | Mean | SD | Mean | SD | Mean | SD |
| Age | 19.8 | 0.64 | 20.2 | 0.54 | 21.8 | 0.42 |
| Response rate | 81.5% | | 82.2% | | 84% | |

## Factorial analysis of the questionnaire

The KMO index was 0.895, indicating sampling adequacy, while the Bartlett sphericity chi-square index was 2295.118, with $p = 0.000$ ($<0.001$) indicating that the correlation matrix was an identity matrix and therefore suitable for factor analysis.

**Table 3.** Factor Loading of each item of Interprofessional Teamwork Evaluation (ITE)

| | loadings | | |
|---|---|---|---|
| | I | II | III |
| **Subscales** | $\alpha = 0.924$ | $\alpha = 0.853$ | $\alpha = 0.712$ |
| **Communication and mutual support** | | | |
| Q3. All clinical roles represented (e.g. patient /community interview, medication history/review; diagnostic exam; intervention plan) | .625 | | |
| Q9. Empowers team members to speak freely and ask questions (minimal time spent dominating encounter and providing one-way orders just coming from leader) | .784 | | |
| Q13. Team members share focus on patient problem and outcome | .726 | | |
| Q14. Members provide task-related support | .781 | | |
| Q15. Advocates for the patient/community | .582 | | |
| Q16. Team members are properly assertive | .726 | | |
| Q17. Disagreement with team members assessment, actively and openly discuss alternatives | .751 | | |
| Q18 Collaborates with team members (e.g., discuss things among each other in smaller groups first) | .806 | | |
| Q19 Introduction of team members to patient/family/ community | .662 | | |
| Q20. Members provide brief, clear, specific and timely information/ recommendations to other members | .796 | | |
| Q21. Members seek information from all available team members (e.g. ask for help; second set of eyes; solicit opinions) | .808 | | |
| Q22. Verify that communicated information is accurate (e.g. clarify when there is uncertainty or disagreement, information is verified and confirmed) | .794 | | |
| Q23. Member side conversations are openly communicated with team as a whole | .716 | | |
| Team structure and leadership | | | |
| Q1. Team leader established and evident (ok to shift over course of interview, leader still clear) | | .660 | |
| Q2. Roles and responsibilities established (support member roles clear) | | .645 | |
| Q4. Clinical roles shared among members of the team (e.g. more than one person fulfils all roles) | | .727 | |
| Q5. Actively share information among team members (e.g. shares results of survey etc.) | | .706 | |
| Q6. Balances workload with team (team leader not dominating entire encounter) | | .775 | |

**Table 3.** CONTINUED

| | loadings | | |
|---|---|---|---|
| | I | II | III |
| **Subscales** | $\alpha = 0.924$ | $\alpha = 0.853$ | $\alpha = 0.712$ |
| Q7. Delegates tasks, unanswered clinical questions as appropriate | | .781 | |
| Q8. Conducts briefs, huddles and debriefs throughout the patient encounter (summarises, team reviews thoroughly/systematically what has happened, what still needs to be addressed, etc.) | | .785 | |
| Situation monitoring | | | |
| Q10. Includes patient/ family/ community in conversation and the encounter (should occur throughout the scenario) | | | .746 |
| Q11. Cross monitors fellow team members (other team members find out information being exchanged and decisions being made in side conversations) | | | .868 |
| Q12 Update team members on patient status/ result of intervention etc. | | | .858 |

Exploratory factor analysis yielded three subscales which differed from the original questionnaire's subscales by Shrader et al [52]. Items of "communication" subscale converged with several items of the "mutual support" subscale, while all items of the "leadership" subscale converged with the items of the "team structure" subscale. Because the factorial analysis resulted in a different structure from the original questionnaire, the authors chose to rename the subscales as follows: subscale (a) "communication and mutual support" (13 items), subscale (b) "team structure and leadership" (7 items) and subscale (c) "situation monitoring" (3 items) with Cronbach's alpha scores of 0.924, 0.853 and 0.712, respectively (Table 3).

In general, medical students' scores for interprofessional teamwork were higher than the scores of midwifery and nursing students. The Kruskal-Wallis statistical test results revealed significant differences in students' mean rank scores on all items in subscale communication and mutual support, with the scores of midwifery students the lowest compared to the nursing and medical students. The results showed that midwifery students had a poor perception of interprofessional communication and the mutual support carried out by the group during the CBIPE activities. In addition, there were significant differences in students' mean scores regarding "Team leader established and evident" and "Actively shares information among team members", with the mean scores of nursing and medical students lower than midwifery students. These results indicate that the three groups of students assess leadership performance differently. Communication, mutual support and leadership are a problematic area of interprofessional teamwork (Table 4).

**Table 4.** Mean difference of each item

| | Midwifery | Nursing | Medical | p |
|---|---|---|---|---|
| **Communication and mutual support** | | | | |
| Q3. All clinical roles represented (e.g., patient / community interview, medication history/review; diagnostic exam; intervention plan) | 3.72 ± 0.45 | 3.87±0.33 | 4.30±0.46 | 0.000* |
| Q9. Empowers team members to speak freely and ask questions (minimal time spent dominating encounter and providing one-way orders just coming from leader) | 3.48 ± 0.50 | 3.61±0.49 | 4.40±0.54 | 0.000* |
| Q13. Team members share focus on patient /family/ community problem and outcome | 3.51 ± 0.53 | 3.56±0.50 | 4.37±0.53 | 0.000* |
| Q14. Members provide task-related support (e.g., midwife gives education to pregnant woman based on the diagnosis of doctor, etc.) | 3.59 ± 0.49 | 3.64±0.48 | 4.29±0.48 | 0.000* |
| Q15. Advocates for the patient (e.g., "let's think about what's in the patient's/ community's best interest") | 3.33 ± 0.47 | 3.64±0.66 | 4.19±0.47 | 0.000* |
| Q16. Team members are properly assertive (e.g. willing to participate, speak up, acknowledge) | 3.55 ± 0.53 | 3.73±0.48 | 4.37±0.48 | 0.000* |
| Q17. Disagreement with team members' assessment, actively and openly discuss alternatives) | 3.41 ± 0.49 | 3.52±0.50 | 4.31±0.53 | 0.000* |
| Q18 Collaborates with team members (e.g., discuss things with each other in smaller groups first) | 3.58 ± 0.52 | 3.58±0.49 | 4.35±0.50 | 0.000* |
| Q19 Introduction of team members to patient/family/ community | 3.65 ± 0.61 | 3.56±0.53 | 4.22±0.47 | 0.000* |
| Q20. Members provide brief, clear, specific and timely information/ recommendations to other members | 3.47 ± 0.50 | 3.59±0.49 | 4.28±0.48 | 0.000* |
| Q21. Members seek information from all available team members (e.g., ask for help; second set of eyes; solicit opinions) | 3.42 ± 0.49 | 3.54±0.50 | 4.37±0.50 | 0.000* |
| Q22. Verify the accuracy of communicated information (e.g., clarify when there is uncertainty or disagreement, information is verified and confirmed) | 3.46 ± 0.50 | 3.51±0.50 | 4.30±0.50 | 0.000* |
| Q23. Member's side conversations are openly communicated with team as a whole | 3.52 ± 0.53 | 3.68±0.48 | 4.16±0.48 | 0.000* |
| **Team structure and leadership** | | | | |
| Q1. Team leader established and evident (ok to shift over course of interview, leader still clear) | 4.22 ± 0.72 | 4.02±0.51 | 4.03±0.50 | 0.041* |
| Q2. Roles and responsibilities established (support member roles clear) | 4.14 ± 0.69 | 4.21±0.58 | 4.02±0.62 | 0.186 |

**Table 4.** CONTINUED

| | Midwifery | Nursing | Medical | p |
|---|---|---|---|---|
| Q4. Clinical roles shared among members of the team (e.g., all members have roles to do) | 4.08 ± 0.70 | 4.14±0.63 | 4.09±0.72 | 0.926 |
| Q5. Actively share information among team members (e.g., shares results of survey etc.) | 4.26 ± 0.74 | 4.08±0.63 | 3.93±0.63 | 0.009* |
| Q6. Balances workload with team (team leader not dominating entire encounter) | 4.00 ± 0.75 | 4.14±0.61 | 3.87±0.57 | 0.052 |
| Q7. Delegates tasks, unanswered clinical questions as appropriate | 4.07 ± 0.77 | 4.09±0.57 | 4.05±0.61 | 0.929 |
| Q8. Conducts briefs, huddles and debriefs throughout the patient encounter (summarises, team reviews thoroughly/systematically what has happened, what still needs to be addressed, etc.) | 4.05 ± 0.74 | 4.08±0.61 | 4.06±0.62 | 0.970 |
| **Situation monitoring** | | | | |
| Q10. Includes patient in conversation and the encounter (should occur throughout the scenario) | 4.19 ± 0.62 | 3.96±0.65 | 4.02±0.58 | 0.109 |
| Q11. Cross monitors fellow team members (other team members find out information being exchanged and decisions being made in side conversations) | 4.17 ± 0.68 | 4.02±0.66 | 3.96±0.59 | 0.113 |
| Q12 Update team members on patient status/ result of interventions, etc. | 4.13 ± 0.73 | 4.00±0.70 | 4.08±0.54 | 0.617 |

*significantly different based on the Kruskal-Wallis statistical test

## Qualitative findings

Focus groups discussions shed light on why midwifery and nursing students give less positive perceptions of communication and mutual support. The reasons were: communication gap due to lack of confidence, different ways of thinking affected communication in decision making, and the leadership culture on collaborative practice in health services.

## Communication gap due to lack of confidence

Some nursing and midwifery students felt insecure when collaborating with medical students. They felt inferior in terms of both social status and knowledge. This lack of confidence impeded communication and coordination between students during collaboration.

> *"In our opinion communication is still a problem. We don't feel so involved. We rarely propose anything at meetings, and sometimes we're scared to even ask for information. We don't know why, but we hesitate because we feel that our knowledge is not as important as the science of medical students." (Midwifery student 6)*

## Different ways of thinking and level of education affected decision making

Another communication problem was in decision making. Medical students were often the ones to decide. Midwifery and nursing students complained that they wanted to contribute and provide alternative solutions, but, as medical students generally wanted a fast answer, they made quick decisions which the other professional students would have to agree with.

> *"We really want to argue, but, while we're still thinking of alternatives, the med students already make the decision, so finally we all have to agree with it." (Midwifery student 1)*

Nursing students suggested that the differences may be influenced by how students from both health professions are educated to think in making decisions.

> *"In our opinion there is difference in the way of thinking of medical and nursing students. We, nurses, are used to thinking holistically. Even when doing nursing care or nursing diagnostics, we make considerations such as from 'head to toe'. For medical student it might be considered as taking time. So, what happens was that while we were still thinking they already made the decision. OK, finally we just followed." (Nursing student 7)*

Level of education also influenced decision making collaboration. As informed earlier that midwifery students were in their final year (3rd year) therefore they were in different grade with medical and nursing students who were in their clinical phase (year 5). Unequal level of education was reported by students as factors that might hinder communication.

> *'We realised that communication problems arose because midwifery students are junior to us, so they might have a feeling of apprehensive when it comes to expressing opinions. Even though we have asked them to argue, they provided very few opinions. Finally, we decided lots and they followed' (Medical student 5)*

### Leadership culture in health services influences the choice of team leader

The other interesting finding was that all 30 groups of interprofessional teams in this study were led by medical students. This may be explained by the fact that the health profession culture places doctors in the highest hierarchical position of collaborations. Therefore, midwifery and nursing students tended to give leadership positions to medical students.

> *'Yes, we appointed medical students as leaders in our group, that's the culture, right? Even so, we still had opportunity to lead several smaller projects, related to our responsibilities. "(Nursing student 2)*

## DISCUSSION

This study aimed to evaluate students' perception toward their teamwork during CBIPE programme and how they experience CBIPE educational design. To answer the first question, we did a survey using the Interprofessional Teamwork Evaluation (ITE) instrument and to answer the second question, we collected data from focus group discussions.

Students experienced the three weeks of IPE activities as successful in stimulating them to work in teams with the community to solve the community's health problems. However, midwifery and nursing students had markedly different experiences. Although students had the opportunity to develop their communication skills with the SACBIPE programme, the quantitative data indicated that midwifery and nursing students did experience problems with communication and mutual support. The results of the FGs showed that the root of this issue was the lack of confidence and initiative in nursing and midwifery students. Previous studies have reported that midwifery students often lack confidence in their own abilities [53]. Nursing and midwifery students are reported to consider themselves less competent than medical students in terms of knowledge and skills due to several factors, such as their status in society, competence and academic abilities [54, 55]. Tyastuti and colleagues (2013) recommend implementing non-scheduled extra-curricular activities for multi-professional students to help them improve their relations before they begin an IPE programme [56].

Medical students were mostly the leaders of the community-based projects in our research, a situation similar to one reported by a previous study [54]. The quantitative finding also reported that in general midwifery students and nursing students were satisfied with the way medical students lead the group. They reflected that it was natural to make medical students as leaders of the groups because in real healthcare team context doctors will lead the healthcare teams. This perception was affected by healthcare team culture which was developed based on hierarchical relationships and dominant-subordinate relationships [40,

57] and which always places doctors as the highest position and marginalized other professions. Yet with the complexity of current health problems, it is known that leadership must be collaborative and must focus on building trust and sharing power [41]. Such collaborative efforts necessitate a shift away from vertical or hierarchical relationships of influence to horizontal power sharing [58]. Considering that, health care professional students including nurses and midwives must be prepared with leadership competencies to enable them to meet the challenges of leading collaboratively with other professions. IPE is one approach that can be implemented to develop shared, transformational leadership skills [41, 59, 60].

The uni-profession FGs revealed that students were satisfied with the design of SACBIPE and that it helped them to learn about IPC and community-based practice. Students argued that the learning design was more effective in fostering collaboration and teamworking skills compared to their experiences with interprofessional PBL. This finding suggests that active engagement in a workplace learning setting is a more effective way to expose students to IPC and help them learn about it. It also suggests that learning in real practice effectively fosters the culture that must be developed in the real situation and that learning with an IPE design will be effective if implemented in practice-based settings [17-19, 61].

CBIPE seems a potentially effective way to stimulate interprofessional collaborative learning for students. Our research indicates that successful implementation is possible but that the role of supervisor/teacher and assessment procedures both require close attention. Previous studies have highlighted the role of the supervisor/teacher in community-based IPE [24, 56]. In the IPE context, teaching staff must perform additional roles, including facilitating collaboration, sharing IPC values, such as showing respect, valuing other professions, collaboration, assessing collaboration and facilitating reflection on and evaluation of collaboration [62]; [63, 64]. This requires the faculty development programme to pay specific attention to developing equal perceptions and the teachers' understanding of interprofessional education and collaboration so that they can develop, implement, and facilitate IPE activities [62, 65-67].

The literature has also paid attention to IPE assessment [68-70]. Assessment of community-based education is known to be done by measuring problem-solving skills, communication, leadership and critical thinking capabilities. Assessment can be done by applying such methods as direct observation of particular skills during an intervention, the students' report, and reflection sessions [71, 72]. These methods are also suitable for CBIPE, with the addition assessing the particular skills and attitudes that need to be developed in collaboration with other health workers. [24, 73] Our research suggests incorporating specifically the views of community members in the assessment since they have first-hand experience with the students' activities.

The mixed methods approach to evaluate a model of community-based interprofessional education, this SACBIPE programme, and the resulting teamwork skills of the students can be considered strengths of this study. There is a limitation in that data were collected from schools of health profession of one university in Indonesia, which might restrict the generalizability of our

findings. However, we aimed to increase transferability [74] by providing a rich context description of the setting and programme so that others might interpret the value of the research for their own context. Future research could try to further unravel the influence of culture and power dynamics on interprofessional community-based education.

## CONCLUSION

The SACBIPE programme was successfully implemented. It demonstrated that it could help health professional students develop their skills in collaborative practice. SACBIPE could provide learning activities that treat the community extensively as a learning environment, fostering active engagement not only in students but also members of the community throughout the educational experience. With CBIPE, students learn in the context of the community itself and work collaboratively in interprofessional teams to provide an expected health service despite limited resources. Nevertheless, problems are still found in communication and leadership skills, so that teaching in these skills needs improvement in the future. As complex learning, IPE needs a comprehensive approach in its implementation that includes various teaching methods and proper learning strategies. To this end, community-based education models seem promising.

### Data sharing statement

Materials and supporting data are deidentified, however, they are available for download on the website: https://drive.google.com/drive/folders/1pH6iMwf43xI8JGCQGbha2vuKNRa_FtS3. All files may be used for research and education with further consent.

### Disclosure

The authors declare that they have no competing interests. The authors alone are responsible for the writing and content of this paper.

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CHAPTER 6

# COMMUNITY BASED INTERPROFESSIONAL LEARNING PROMOTES EQUALITY OF PARTICIPATION AMONG HEALTH PROFESSIONS STUDENTS

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## ABSTRACT

**Background**

The complex health issues require comprehensive health practice involving various professions. Inter-professional education employing various learning activities has been proposed to improve the quality of collaboration and attitude toward other profession. This study aimed to explore students' participation and social interaction within discussion session of community-based IPE.

**Method**

A total of 78 final pre-clinical year students from medical, nursing, and midwifery were randomly divided into 15 interprofessional groups. Community-based interprofessional education (CBIPE) program employing surveys and discussion to solve community health problems was conducted. Students' discussion sessions were video-recorded and the conversations were verbatim transcribed. Content analysis was applied to evaluate students' participation and social interaction dimension; included "Externalisation", "elicitation", "quick consensus building", "integration oriented", "conflict-oriented consensus". Statistical analysis was applied to evaluate the different number of the mentioned social interactional dimensions produced during discussions among professional groups.

**Results**

"Externalisation" was the most produced dimension for sharing knowledge. There were no significant different number of participations, "externalisation" and "elicitation" dimensions among professional groups ($p=0.104$, $p=0.871$ and $p=0.557$ respectively) during discussion session. Equal participation and production of "externalisation" implies that students performed equal participation and equal contribution in constructing knowledge during the discussion session of CBIPE.

**Conclusion**

Discussion sessions of community based interprofessional learning stimulates equal participation, equal contributions and mutual respect among learners from different health professional background in solving community health problems.


**Keywords:** Community-based interprofessional education, Community health problem solving learning, Interprofessional collaboration

## INTRODUCTION

Current health issues become very complex, because health care is not only focused on efforts to cure the disease, but also on promotion and disease prevention at the society or community. [1, 2] This situation requires comprehensive health services such as preventive, curative, rehabilitative and promotive, so it would be difficult if it is only done by a doctor. Healthcare professionals must work together to realize the comprehensive health services in the community, in order to obtain maximum results of healthcare services.

However, literature reported that less effective inter-professional communication, poor inter-professional relations, lack of trust among team members, and underestimate the role of other health professionals gave negative impact on collaboration among the health professions [3]. Previous studies reported that poor collaboration among healthcare professionals had led to medical errors and negatively impact on patients' safety in significant ways [4-7]. In addition, role blurring or role ambiguity among health care workers occurs in the health services community settings. This ambiguity is due that health professional education is conducted in uni-professional setting, with limited opportunity for students to interact with other professions. This situation might influence graduates' readiness to work inter-professionally in work place, such as in primary care and cause overlapping of roles among the health workers when they have to work together [8]. Moreover, hierarchy in Asian culture makes community considers doctors to have the highest position in society while marginalizing other health professions such as nurses and midwives [9, 10]. This condition affects the power distance between doctor and other health professions resulting in inequality of contribution among professions in dealing with patients' and community's health problems.

To address this challenge, the World Health organization (WHO) suggested that interprofessional education (IPE) should become part of health care curricula worldwide [11]. All health care professionals should receive IPE to deliver patient-centred care as members of an interdisciplinary team. Within IPE, students are expected to learn interprofessional collaboration (IPC) and bring their acquired knowledge, skills and values into their practice in the future. IPE is expected to play an important role in reducing the problems in the health care system by promoting effective collaboration. Research has reported that health professionals that were taught together in an inter-professional educational setting and learned to collaborate as a team during their student years, were far more likely to work effectively together in their professional lives in a clinical setting [7, 12, 13].

Community-based education (CBE) has been suggested as an education format for IPE to facilitate students' collaborative skills in the workplace [14-16]. Within community based interprofessional education (CBIPE), students learn in the context of the community itself and are expected to work collaboratively as interprofessional teams to provide an expected health service within the community [15]. Discussion of community health problems is one of students' learning activity in CBIPE. After conducting a community health-problem survey, student conduct

discussion session to analyse the data, to diagnose primary community health problems and to propose interventions for the problems diagnosed [16].

Educational psychologists explain that when learners interact and exchange ideas in a group, cognitive processes are stimulated. In one of these processes; co-elaboration, knowledge is generated when participants of the small group discussion extend each other's ideas [17]. Within the cognitive process, an important aspect is the move from assimilation to construction; that is creating a new understanding based on the discussion that the learners have had. Collaborative knowledge construction happens when learners do the process collaboratively [18]. The collaborative knowledge construction processes can be evaluated by assessing students' participation and social interaction dimensions produced by students during discussion [18-20]. Analysis of participant dimension in interprofessional learning will provide us information whether learners from different health profession background participate at all and on an equal basis. The quantity of participation can thus indicate if learners had theoretically been in the position of being able to acquire knowledge within the environment. Analysis of social interaction dimensions describe to what extent learners refer to contributions of their learning partners which indicate the existence of shared knowledge construction within interprofessional health care learning, and what patterns of social interaction dimension develop within interprofessional learning [19-21]. Understanding collaborative learning requires making sense of the conversation that students engage in and the tools that mediate their learning [22]. Therefore, to study collaborative knowledge construction we need to examine group activity in its specific context [23, 24].

The purpose of this study was:

1. Do students participate equally during the discussion session within community based interprofessional learning?
2. How the social interaction of the discussion session within community based interprofessional learning was like?

### Ethical Approval

The study was approved by the Ethical Committee of Medical Research of Sultan Agung Islamic University and was conducted at Universitas Islam Sultan Agung, Semarang Indonesia (Letter No. 290/XII/2013/Komisi Bioetik). No physical risk could be identified by taking part the study. It was explained to the participants that participation to the study was voluntary basis and that refusal to join the study would have no consequences. The purpose, procedures, and confidentiality of the study were explained to participants accordingly. Consent was implied by the fact that the respondents took part all the activities voluntarily. Confidentiality was ensured by anonymity.

## METHOD

### Context

In Indonesia inter-professional collaboration skills have been included in the core curriculum of all undergraduate health profession programs. However, very few universities in Indonesia have actually incorporated an IPE program into their curriculum to facilitate collaborative learning of multidisciplinary students. As IPE; including IPE for community health care; has not been implemented at Sultan Agung Islamic University, and as Sultan Agung Islamic University intended to develop an IPE curriculum for the programs of Medicine, Nursing and Midwifery, a pilot project on pre-clinical year IPE was conducted.

Midwifery and nursing students have early clinical encounters as part of their curriculum in year 2 and 3 of their program respectively, where they experience at least two months of practice in the hospital or public health centres. Medical students do not gain experience of practice in their pre-clinical years other than practice in skill labs with simulated patients and manikins. Learning in all programs is mono-professional; therefore, students rarely interact collaboratively with other health care students other than their own, even during clinical rotation and community health care. Previous studies reported that students were generally favourable to IPE, appreciating the opportunity it offered them to hone their interprofessional leadership, collaboration and communication skills and to learn to address the problem of role blurring [25, 26]. Students in their final pre-clinical year of medical, nursing, and midwifery were approached to participate in inter-professional learning activities, including community program including survey to the community to gather information on community health problems as well as discussion the solving of the problem.

The inter-professional learning activities in community lasted for three weeks, and were done in between of students' learning hour activities. Each group was assigned to conduct a survey of community's health problems, to conduct interprofessional group discussion to diagnose the

community primary health problems, to determine and plan health services to address the problems. Penggaron Lor village, District Bangetayu, Semarang was becoming the surveyed community village.

## Research design

This was a quantitative study evaluating the number of participations and social interaction dimensions produced by each professional group during discussion of community health problems.

## Subjects

A number of 78 students from three different health professional backgrounds; medicine, nursing and midwifery, participated the study. They were randomly divided into 15 inter-professional groups; consisting 5-7 students each. Students' participation to the study was voluntary basis. Each inter-professional group was required to survey of health problem in community. Based on the survey results, they were required to discuss and analyse the data to diagnose primary community health problems and to determined interventions to address the problems. Students' participation and social interaction dimensions during group discussion were evaluated to capture the equality of contributions and power among professions.

## Data collection method

A content analysis was performed to explore the students' participation and the type of social interaction dimensions which were determined based on the statements produced during the discussion. For this purpose, all of discussions were video recorded and the conversations during discussions were verbatim transcribed by expertsdi. All statements produced by students during discussion were analysed whether they belong to dimension of "Externalisation", "elicitation", "quick consensus building", "integration-oriented consensus building", or "conflict-oriented consensus building" (table 1)

**Table 1.** Social interaction dimensions

| Social interaction dimensions of knowledge co-construction | definition | Example from excerpt |
|---|---|---|
| Externalisation | Learners make contributions to discourse without reference to other contributions. When Externalising, learners may explicate their knowledge and externalize what they know as well as their point of view. | Nurse 1: From the survey we know the house where the pregnant woman lives has not met the requirements of healthy settlement. The air circulation is not good and sunlight cannot enter the house so the house is damp. We know the properties of bacterial microorganisms of tuberculosis live in moist places and easily die when exposed to sunlight. My suggestion so that we can provide education about housing and health. |
| Elicitation | Using learning partners as a resource by asking questions. Elicitation aims at receiving information from the learning partners. Some studies showed that in more successful groups more task-related questions have been asked. | Midwife 2: at what temperature do mycobacterium TB die? |
| Quick consensus building | In order to get collaboration among group members, the learners accept the opinions of their peers, not because they agree with them, but because it is a way to quickly move on the discussion. In this way, quick consensus building may not indicate an actual change of perspective, but is rather a coordinating interaction. | Medical 4: We know that low family income also affects the incidence of TB in pregnant women. Even that's the main trigger. Because of the low income, good health, education and decent home stay cannot be fulfilled. But we cannot educate them to improve economic aspect because it is not our domain.<br>Medical 5: yes, I agree. It's the job of economics or business students to educate them (to increase family income). |
| Integration oriented consensus building | The learners reach a consensus through an integration of their various opinions and points of view. They synthesize their ideas in order to understand the task logically. Integrative consensus is characterized by a take-over of perspectives. It happens when individual learners change their idea based on the reasoning of their learning partners. Learners may modify their beliefs and correct their argument based on their peers' contributions | Medical 4:<br>besides the problem of living habitation, we also have to educate the importance of nutrition improvement of pregnant mother. We give education of healthy food for pregnant woman, if necessary, we make daily healthy menu.<br>Medical 5: they live with low socioeconomics. We educate them to create a family nutrition garden. Plant your own vegetables and fish with intercropping systems.<br>Nurse 3: we need the help of agricultural students.<br>Medical 5: we can learn by ourselves from the internet too much<br>Medical 4: So agree, education for improving nutrition and family gardening education, huh? |

**Table 1.** CONTINUED

| Social interaction dimensions of knowledge co-construction | definition | Example from excerpt |
|---|---|---|
| Conflict-oriented consensus building | Creating a consensus through conflict is prominent element in collaborative learning. When building a consensus, learners have to identify and understand what important aspects behind the contribution of their peers and modify them or give alternatives. In that situation, learners need to understand the reasoning of their peers rather than simply accept of other participant idea. In conflict-oriented consensus learners are open to criticism, thus it is possible for them to find better arguments to support and justify their opinions. | Nurse 1: I suggest giving Fe supplement for pregnant woman<br>Midwife 2: No need. It has been done by midwife in their public health centre service.<br>Midwife 3: As far as I know all pregnant women will get Fe supplements during pregnancy. Not only for those with the low Hb. It's part of the procedure to prevent anaemia in pregnant women. We know that anaemia in pregnant women can cause miscarriage, placenta solution and fetal-death<br>Medical 4: if pregnant women got good nutrition during pregnancy, in my opinion they do not need to get additional Fe tablet.<br>Midwife 3: As far as I know, all pregnant women are given Fe tablets, even other supplements such as folic acid, vitamin B6, B complex, vitamin C and calcium. But what commonly given by midwives to pregnant women is Fe and calcium, which are available at the public health centre.<br>Nurse 1: But how with those who do not do ANC regularly?<br>Medical 4: Oh .. OK. We will design a programme to give the Fe and Calcium supplements for those who do not get the supplements from the public health centre. |

## Data analysis

Students' participation during discussion and social interaction dimensions were analysed quantitatively, by comparing the number produced statements of professional groups and the number of the social interaction dimensions (Externalisation, elicitation, quick consensus building, Integration-oriented consensus building or conflict-oriented consensus building) produced by each profession in every discussion. The difference of mean rank number of the occurrences of the social interaction dimensions was statistically tested employing Kruskal Wallis statistical test.

## RESULT

The subjects were students of the final pre-clinical year students of medical, nursing, and midwifery program. A number of 78 students voluntarily took part the IPE pilot project which was focused on community health problem solving project. (Table 2)

**Table 2.** Demographic characteristics of participants

| | Midwifery | | Nurse | | Medical | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Gender | | | | | | |
| Male | 0 | 0 | 9 | 37.5 | 18 | 50 |
| Female | 21 | 100 | 15 | 62.5 | 15 | 50 |
| Admission | | | | | | |
| scholarship | 3 | 14.3 | 3 | 11.1 | 0 | 0 |
| regular test | 18 | 85.7 | 21 | 88.9 | 33 | 100 |
| decision to study at the program | | | | | | |
| own preference | 21 | 100 | 21 | 88.9 | 27 | 81.8 |
| encouraged by parents | 0 | 0 | 3 | 11.1 | 6 | 18.2 |
| Experience of working with students from other study program | | | | | | |
| yes | 15 | 71.4 | 18 | 75 | 18 | 54.5 |
| no | 6 | 28.6 | 6 | 25 | 15 | 45.5 |
| | Mean | SD | Mean | SD | Mean | SD |
| Age | 19.8 | 0.63 | 20.2 | 0.66 | 19.8 | 0.42 |
| GPA (max score 4) | 3.14 | 0.39 | 2.98 | 0.26 | 3.57 | 0.48 |

There were various health problems, which were identified and successfully managed by the students. Students identified major problems such as: pregnant woman with low social economic status who did not have access to health insurance, did not have antenatal care in the public health center during their pregnancy and did not have enough nutrition in their daily diet. Some parts of the community health problems had been agreed to be followed up with community health care activities. (Table 3)

**Table 3. Students' community project in pregnant women**

| No | Problems identified | Students' interventions | Results |
|---|---|---|---|
| 1 | Only 20% of pregnant women who did antenatal care in local public health center | Motivate pregnant woman to do antenatal care to midwifery in practice or to the nearest public health center | Moderate-high compliance |
| 2 | About 36.8% of pregnant women have low knowledge about monitoring of pregnancy | Direct education to pregnant woman | High compliance and motivated to do ANC |
| 3 | 20% pregnant women with risk factors according to standard of WHO | Motivate to do routine ANC and monitoring.<br>Educate family member to take care the pregnant woman | High compliance |
| 4 | 2 cases of pregnant woman with TB | Educate the whole family member about TB, to improve the quality of live, educate about healthy house etc. | High compliance |
| 5 | 60% pregnant women don't have health insurance due to social economic problem | Direct education to the family (husband and wife) on how to apply public health insurance | Some family consider to apply for health insurance |
| 6 | 73% pregnant women did not have enough nutrition in their daily diet | Educate the pregnant woman healthy diet and examples of menu, provide calcium supplement | Moderate-high compliance |
| 8 | 24% of pregnant women with anemia) | Provide Fe supplement, educate to grow green vegetables using hydroponic. | High compliance |

The participation and social interaction dimensions produced by each professional group during discussion were presented in table 4. The finding indicated there were no significant differences of mean rank of participation among groups. "Externalisation" was the most produced dimension. All professional groups were equal in producing eternalization and elicitation, but their production of consensus was significantly different.

**Table 4.** Mean of participation and social interaction modes produced in discussions

| Participation and Social interaction modes | Nursing students | Medical students | Midwifery students | p |
|---|---|---|---|---|
| Participation | 11.7 | 25 | 11.80 | 0.104 |
| Externalisation | 6.90 | 8.67 | 5.80 | 0.871 |
| Elicitation | 0.60 | 2.67 | 0.40 | 0.557 |
| Integration-oriented consensus | 0.30 | 2.50 | 0.20 | 0.001* |
| Conflict-oriented consensus | 0 | 1.3 | 0 | 0.016* |
| Quick consensus | 0 | 1.17 | 0 | 0.022* |

*statistically significant based on Kruskal Wallis test

## DISCUSSION

Within CBIPE, the health profession students successfully worked together to empower the community to solve most of the community health problems that had been identified. The objective of the learning activity is to give health profession students direct experiences to work as a health team in dealing with the community health problems in this case, low-income pregnant woman. In this study, students identified several health problems in the family with low social economic status, low education, and did not have any health insurance. Hence, the health profession students within this program also had an opportunity to learn several principles of culture, norms and social aspects for educating and communicate health related topic to low educated community.

The finding indicated that the "externalisation" dimension was the most common type of statements produced by students during the discussion process. Students produced more perspectives in accordance with their scientific background and based on their professional point of view. Externalisation is important steps as when externalising, learners may explicate their knowledge. Learners externalise what they know, such as to explain their perspective. By externalisation, learners restructure knowledge into a linear form. Thus, knowledge is simultaneously reorganized when it is externalised. Considering that, understanding the knowledge that should be explained become very important aspect in externalisation [19-21]. Thereby it was greatly understood if externalisation becoming the most common type of dimension produced in the CBIPE discussion, because students from different professions seek to contribute to solving the community's health problem based on their expertise.

Integrative consensus was the most widely produced consensus in the discussion. During discussion, integrative consensus was produced by both students and facilitator, to conclude and accommodate a variety of opinions. It was clear that integrative consensus was mostly produced consensus as students from different professions generally intended to add information from a different angle based on their scientific background. They wanted to contribute to make the consensus better by integrating various opinions. Nonetheless, conflict-based consensus also occurs, especially if there was difference of opinion on an issue that requires a definite decision while each member of the group has different opinion and point of view regarding the settlement of the issue. Conflict-based consensus is an important element in collaborative learning [19]. When building a consensus based on the conflict, students must identify and understand what important aspects behind the contributions of opinion produced by their peers and modify the opinion or give alternative opinions. In that situation, learners need to understand the reasoning of counterparts not just accept the opinion of other participants [19]. In the social interaction, consensus based on this conflict will make learners to learn to be open to criticism, and enable them to find a better argument to support and justify their opinion [19-21].

The lack number of conflict-based consensus was also probably due to the Asian community culture that emphasizes tolerance and avoids conflict so that problem solving was done by compromising and integrating all viewpoints to minimize conflicts. This is the reason of the most

dominant produced statements were integrative consensus statements rather than the conflict-based consensus statements.

As discussion is supposed to improve skills of critical thinking, arguing and defending opinions [27, 28], and as the result of this study showed a lot of production of integrative consensus and lack of consensus based on conflict, this indicated that the discussion activities done within CBIPE program has not reach the target of improving critical thinking skill. Students seemed to create a cosy atmosphere of discussion by accommodating and compile all the statements produced by participants. However, if the finding was viewed from the perspective of efforts to foster respect and equality within health professional team, the integrative consensus showed positive results, because it indicated that students from different professions could accept the opinion of other professions and accommodate other professions' opinion in solving community's health problems faced by the health professional team [29, 30]. A quick consensus also produced several times by students during discussions. This interaction pattern was commonly used at the end of the discussion when the time is not sufficient or to agree on a settlement of the case which has been deeply explained by the participants. The lack of students' initiative revealed that awareness of students to do deep learning was still lacking.

The number of integrative consensus and conflict-based consensus were significantly different among professional groups. Both of the consensuses were mostly produced by medical students. There were no significant differences of participation, externalisation and elicitation statements produced by students from different professional backgrounds. The findings indicated that students from different health profession program can participate in equitable. Discussion on community health problems CBIPE within CBPI reduced the boundaries of the profession interaction and trained students to contribute in an equal way, to respect other professions and to encourage students to contribute in the process of discussion. There was no difference on the number of statements of externalisation among healthcare professional students which indicated that the discussions run comfortably and grew mutual respect, so that all students of various professions can externalise their ideas confidently [19-21]. As such, inter-professional learning applying discussion to solve community's health problems could cultivate the attitude of respecting other professions' opinion and provide comprehensive settlement of community's health problems as the settlements were supported by different viewpoints of health professional students.

## CONCLUSION

Discussion session of community-based inter-professional education stimulate equal participation among group members. There was no different number of externalisation and elicitation statements produced by professional groups during discussions indicating that this learning model potential to foster equality and mutual respect among health professions within healthcare team. It is also potential to drive students from all health professional background to be confidence to contribute within interprofessional discussion.

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CHAPTER 7

# GENERAL DISCUSSION

The complexity of healthcare issues has been recognised to be growing worldwide [1, 2]. Challenges for the health services in Indonesia can be considered to be even more complex given the size of the country, its population and population diversity [3]. The need for interprofessional collaboration (IPC) to deal with these challenges and preparing future healthcare professionals for interprofessional practice has been recognised on various levels and has opened the door to the introduction of interprofessional education (IPE). In 2014, the Indonesian Ministry of National Education mandated the introduction of IPE in Indonesian Health Professional Programmes. Based on research describing the preconditions for the effective implementation of IPE [4], and taking into account the hierarchical social, clinical and student-learning cultures present within Indonesia [5-7], this PhD dissertation aimed to investigate and understand the aspects that should be considered when implementing IPE in an Indonesian (Asian) context.
This aim was translated into the following research questions:

1. What are students and teachers' perceptions of and readiness for IPE in Indonesia?
2. To what extent can problem-based learning (PBL) be considered a suitable education format for interprofessional education in Indonesia and to what extent is PBL effective as an education format for IPE?
3. To what extent can a community-based education (CBE) programme be considered a suitable education format for IPE in Indonesia and to what extent is CBE effective as an education format for IPE?

This Discussion Chapter will present the key findings and conclusions of each study reported in this dissertation. Based on these findings, three overarching points for discussion are raised. Finally, the strengths and limitations of this dissertation, the implications for practice resulting from our research, including suggestions for future research will be addressed.

## 1. MAIN FINDINGS AND CONCLUSIONS

### Evaluating Students and Teachers' readiness for IPE

Given the importance of understanding students and teachers' readiness for IPE [2, 8, 9], we addressed this by first performing two mixed-methods studies in which we used questionnaires, focus groups and interviews. Combining the Readiness for Interprofessional Learning Scale [10] with uni-professional focus groups, we evaluated students' perceptions of IPE. The results indicated that of the three student populations (medicine, nursing, midwifery) medical students were likely the group most ready for IPE. Furthermore, we found that early exposure to clinical practice triggered both positive and negative attitudes towards IPE. Focus groups further revealed that most students from the three professions acknowledged IPE's importance in learning communication and leadership skills as well as understanding other's roles and responsibilities to avoid role blurring. However, some medical students were opposed to an

implementation of IPE as they experienced pressure to be leaders in interprofessional teams and they did not feel ready for this leadership role. Some nursing students expressed trepidation as they felt that medical students caused insecurity and disengagement in other students. The study concluded that students were generally favourable to IPE. They appreciated the opportunity to practise their interprofessional leadership, collaboration and communication skills and to learn how to address the problem of role blurring.

Health professional faculty members' attitudes towards IPC and IPE were studied combining the 'Attitude towards Interprofessional Health Care Collaboration and Education' scale by Curran and colleagues [11] with four uni-professional focus groups and three interviews with key participants. The findings indicated that nursing faculty's mean scores for attitudes towards IPC and IPE were more positive than those of other healthcare professionals. Focus-group discussions revealed that, according to faculty members, IPE has the potential to respond to these challenges as long as opportunities are provided to contribute equally in meeting patients' needs. Moreover, they suggested that IPC- and IPE-focused faculty development programmes should be conducted for all teachers before the start of the programme. Other suggestions for some teaching approaches and strategies for IPE implementation could be gathered from this study, such as that the IPE team should create innovative strategies for the implementation of IPC and IPE in a range of academic backgrounds.

## Problem-based learning as a model for IPE

After gathering the information regarding students' readiness and teachers' attitudes towards and perceptions of IPE, two models of IPE were implemented and evaluated: Interprofessional problem-based learning and community-based interprofessional education.

PBL was thought to be a good approach for IPE, as it requires shared ownership of the learning task, active participation, discussion and negotiation between group members. Consequently, in Chapter 4, we explored the extent to which students in interprofessional PBL tutorial groups demonstrated constructive collaboration during group discussions by combining structured observations of video recordings (67hrs) of interprofessional PBL discussions with focus-groups discussions with students. The quantitative results of the structured observations in which we used the Maastricht-Peer Activity Rating Scale [12] U@ to evaluate tutorial group activity pointed to medical students contributing more to constructive and collaborative activities than their peers from other healthcare professions. The focus groups provided further depth to our understanding of IPE-PBL group dynamics. Trying to correct misunderstandings without causing offence was a sign of mutual respect but also caused tensions and tentative group dynamics. The tutor's social status affected students' participation in the discussions and professional barriers were found up until the last week of meetings.

### Community-Based Education as a model for IPE

In Chapters 5 and 6 the implementation and evaluation of a community-based interprofessional education (CBIPE) programme was presented. In Chapter 5 we focused on students' perceptions of teamworking during CBIPE and of the design of the programme. We evaluated students' perceptions of teamwork using the Interprofessional Teamwork Evaluation questionnaire [13] and explored their experience with the CBIPE programme by conducting three uni-professional focus-group discussions. Medical students had a more positive attitude towards interprofessional teamwork compared to midwifery and nursing students. Students reported that the design of the CBIPE programme helped them develop collaborative practice skills with other health professional students. Furthermore, the study provided insights into why midwifery and nursing students had less positive perceptions of communication and mutual support skills compared to medical students.
In Chapter 6, we explored students' participation and social interaction within community-based IPE by video recording their conversations during CBIPE. Content analysis was applied to the transcripts of these videos to evaluate the participation and social interaction dimension during the discussion, including the degree of externalisation, elicitation, quick consensus building, and integration-oriented and conflict-oriented consensus building [14]. We performed a statistical analysis of the data. No differences between professions were found for the participation, externalisation, and elicitation dimensions. The statements produced during the discussions most often reflected the sharing of knowledge as a form of externalisation. Similar levels of externalisation indicates that students contributed equally to the knowledge construction process during the discussions. The study concluded that discussion within community-based interprofessional learning stimulates students from different health professional backgrounds to participate and contribute equally.

## 2. GENERAL DISCUSSION

### Addressing students and faculty's perceptions and attitudes remains key to the successful execution and implementation of IPE.

One of the most difficult problems to overcome when implementing IPE are attitudes and perceptions of those who are involved in the programme [15]. Understanding the merits and importance of IPE by the health practitioners and students is crucial to make sure that IPE can be well implemented. [16-20]. Besides, since students and faculty are key recipients of and participants in the new programme, exploring their perceptions of the programme is essential in order to enable successful implementation and execution of the programme [21-23]. Addressing

these perceptions should also help to explore other key factors for successful IPE implementation, such as faculty members and/or students' commitment, enthusiasm, respect, knowledge of other professions, and shared interprofessional vision.

Students and teachers' understanding of the IPE concept needs to be evaluated, as this understanding was found to have an impact on the implementation of IPE [24-28]. Information about potential barriers to implementation obtained through needs assessments, such as stereotyping and negative perceptions of other professions, could become the focus of uni-professional training for students and faculty before the IPE programme is run [29, 30].

If IPE is to be successful in fostering IPC, paying attention to students' perceptions is extra important. The student participants in Chapter 2 demonstrated how especially students' experiences observing clinical practice during clinical rotations or even their own healthcare experiences shaped their beliefs about IPE and IPC. The hierarchical culture and health professionals' lack of respect for other health workers witnessed by students were especially impactful. As these health professionals are potential positive or negative role models for IPC [31, 32], critical reflection on these clinical experiences together with students is warranted. Hood (2014) advocates for addressing this issue both uni- and inter-professionally [33]. Issues such as an understanding of the role of other professions and the urgency of these roles in health services, limitations on the role of the profession and the need to respect other professions must be conveyed to students in the training [4, 33]. Moreover, faculty development is essential and should address clinical teachers as role models and aspects of interprofessional collaboration and patient-centred healthcare services [27, 28, 34, 35].

The importance of faculty perspectives on IPE and IPC, addressed in Chapter 3, is widely supported in the literature [28, 36, 37]: a lack of understanding by faculty of the principles behind both IPE and IPC will hinder successful implementation of IPE [24, 38]. In our research, faculty members perceived IPE as a key preparatory factor for IPC. Chapter 3 called attention to teachers' suggestion that IPE should be integrated early in undergraduate curricula.

To recapitulate, affording students and teachers the opportunity to be involved in the preparation and evaluation of the programme is very important to foster a commitment to the sustainability of the IPE programme [39, 40].

## PBL and CBE can be successful education formats for IPE

An education format will be considered successful for IPE if it can encourage students to improve their collaborative skills that help them to maintain mutual respect and shared values, to work effectively as an interprofessional team, to understand team members' roles and responsibilities, and to communicate in a manner that supports the healthcare teamwork [4, 41, 42].

Both PBL and CBE are built around small-group team learning, which allows students to engage in collaborative learning and have greater opportunities to interact with group

members, encouraging them to appreciate diversity and synthesise perspectives [43, 44]. PBL discussions may result in new knowledge created by an integration of students' diverse perspectives and knowledge [45]. Students are able to elicit, build on and challenge each other's ideas as they attempt to synthesise their professional ideas. With this mechanism of interaction and engagement with other professions, students can broaden their academic prospects. In IPE, the knowledge built in the PBL discussion becomes more comprehensive because it is supported by various professional backgrounds. Synthesising knowledge and ideas also occurred when students took part in the interprofessional discussions of the CBIPE programme [46-48]. Chapters 5 and 6 explained that the resolution of public health problems became more complete and intervention activities to manage health problems became more diverse because of the contribution of thoughts from various professions. Synthesising ideas is actually a form of appreciation of the knowledge and skills possessed by other professions [49-52]. Developing such appreciation is one of the learning outcomes of the IPE programme [53, 54].

Moreover, at the last session of problem-based or community-based learning, the tutor should require the students/groups to do a guided reflection employing various methods. In the interprofessional literature, reflection is often considered a key ingredient for effective collaborative learning and practice [55-57]. During the reflection activities, tutors/facilitators of interprofessional PBL (Chapter 4) and supervisors of interprofessional community-based learning (Chapter 5) should instruct students to reflect on individual and group performance during the programme. Under their guidance, students can share their experiences during collaboration (explaining what happened), analyse individual and group performance regarding collaboration (analysing the learning and collaboration), identify skills and learning needs that need to be assimilated when encountering similar problems and situations in the future (identifying skills and learning needs), and plan future actions including plans for improvement of future collaboration (planning future actions) (Figure 1). This approach is a purposeful process aimed to foster an understanding of a situation or to make sense of it so that future actions can be planned accordingly.


**Figure 1.** Reflection cycle (adapted from Sandars, 2009) [58]

In addition, both interprofessional PBL and CBE are considered education formats that provide a non-threatening learning atmosphere for students. Chapters 4-6 reported that these formats are characterised by a relaxed learning atmosphere led by a facilitator, the learning objectives are determined by students, knowledge is built by all group members, and all group members are responsible for the success of the group learning. With these characteristics, a supportive and a trusting learning climate could be implemented [59]. From the implementation of a community-based education format for IPE we learnt that students enjoyed problem-solving discussions and practising in real settings as a form of active learning. Working together as a team in the community encouraged students to develop their 'soft' skills, such as communication, leadership, conflict management, teamworking and collaboration.

**Table 1.** Summary of the characteristics of effective education formats for an IPE programme.

| Characteristics | Implications |
|---|---|
| Interactive, with small groups of 4-10 students [4]. | Students develop critical-thinking and decision-making skills.<br>Students have the opportunity to interact and express ideas.<br>Students share tasks, learn from one another.<br>Students gain respect for the perception of others. |
| Allow diversity of perspective to solve common group problems [48]. | The group conceptualise problems in better ways and formulate comprehensive problem solutions.<br>Group members articulate their perspective.<br>Students value diversity of perspective. |
| Synthesis of perspectives from different professional backgrounds [43, 44]. | In deciding on diagnosis and treatment, students integrate diverse professional expertise.<br>Group members extend their knowledge as they interact and collaborate with other professions.<br>Students produce new, collective knowledge, improving individual as well as group understandings. |
| Non-threatening learning environment enabling interactions characterised by positive attitudes [4, 59, 60]. | Students build mutual trust.<br>Group members come to regard each other as equal, have positive expectations of their peers, create a cooperative atmosphere, successful teamwork, have an interest in and understanding of other members' differences and similarities. |
| Reflection [55-57]. | Students are able to understand and reflect on their own reflection, other students' thinking and the collaboration.<br>New understandings gained through reflection should guide future actions. |

However, Chapters 4-6 reported that the two education formats also had certain characteristics that potentially hindered collaboration during interprofessional education activities. Some students who had experienced PBL for IPE complained about tutors being too directive and having a powerful role in the constructive learning activities. The production of critical questions was strongly influenced by the tutor whose aim was to challenge students and stimulate deep learning. A less effective tutor could reduce students' participation in constructive learning activities, such as examining the correlation between topics and self-comprehension of the mechanisms/theories, thereby reducing their independence as a group.

Another factor hampering constructive learning was a lack of confidence. Nursing and midwifery students, for instance, experienced a lack of confidence during the IPE programme, in both the PBL and the CBE format. This lack of self-confidence was influenced by a perceived 'inequality' in social status among the health professional groups [61-63]. The healthcare team culture is based on hierarchical relationships and a dominant-subordinate relationship, which generally places

doctors in the highest position while other professions are subordinate [64, 65]. This hierarchical culture in the community also contributed to perceptions of 'inequality' among nursing and midwifery students. These perceptions, in turn, made these students unwilling to criticise opinions and to pose critical questions to other students. Inequality sometimes also hampered their communication and negotiation in some way.

## The influence of professional and cultural hierarchy on IPE implementation

Healthcare teams are often characterised by unequal power relations among health professionals. [66, 67]. Nursing students have been reported to be subordinate to medical students regarding several attributes, such as their status in society, clinical skills, and academic capability [62]. Strangely, concepts of power and conflict are too often absent from the IPE literature [68, 69]. The lack of attention to power and conflict in the common IPE research reports led researchers to consider that most IPE curriculum developers do not regard these topics as important [69]. Nurses, midwives and health professionals other than doctors are culturally formed to place themselves in the hierarchy under doctors [66, 67]. They are considered as doctors' assistants, not as colleagues who share responsibility in taking care of patients. This historical subordinate relationship has been reported to contribute to behaviours that are not favourable to collaboration [66, 70]. The awareness that other health professionals could be subordinate to doctors also made nurses and midwives less confident to actively participate in solving patients' problems. Moreover, apart from being influenced by professional culture, interprofessional healthcare collaboration and education in Indonesia might be further complicated by cultural perceptions and hierarchy present within the community.

Indonesia, like some other South Asian countries, can be characterised as having a strongly hierarchical culture, which in turn influences social, political, and bureaucratic traditions [71]. Power and authority result in a hierarchy of relationships. Status is persistently determining norms in all social relations and is defined by criteria such as family background, age, level of education, professional rank, and the number of one's subordinates or dependents [72]. With regard to professional rank and level of education in Indonesia, doctors are considered to enjoy a higher status compared to other health professionals. Culturally, people are devotedly aware of their position in the social hierarchy and of their status vis-à-vis others and commonly accord more respect and esteem to those enjoying a higher status in the community [72]. These cultural perceptions have been inculcated in every individual within the society, including all health workers.

Other cultural characteristics embedded in Indonesian society and, more specifically, in Javanese sub-culture where the research for this dissertation was executed are values of self-control, conflict avoidance and keeping face [71]. These cultural characteristics have something to do with the urge of wanting to avoid open conflicts, criticism, disputes and disagreement, and to display

respectful and unthreatening behaviour in all relational affairs. Open disagreement is socially inappropriate, outspoken criticism is uncommon, and communication often takes the form of tacit understandings in which a lot of things are left unexpressed. In discussions to take decisions and positions, criticism and confrontation are avoided. Consensus is considered to be an important thing to achieve [71].

This culture of avoiding conflict, criticism of other people's opinions and open disputes, especially when they call into question the ideas of a superior, also affects student performance in interprofessional PBL. It was reported in Chapter 4 that students did not criticise the opinions of other professionals much. Misunderstandings were corrected in an indirect way, to save other people's face and avoid embarrassments, for instance by citing different learning sources that were more worthy of reference rather than countering the opinions of group members who held different views. To avoid conflict, disagreements were always resolved by quick consensus. Chapter 4 reported that nursing and midwifery students felt inferior to other health professional students and tended to avoid disagreement.

It is known that the hierarchical culture that is formed and developed in society and in healthcare teams is likely to affect the learning process and outcomes of IPE. It is also well known that it will be difficult to change the influence this hierarchical culture and the culture of conflict avoidance and saving faces have on students' performance in terms of collaboration. However, as practice continues to prove, it would be wrong to assume that an IPE programme cannot be executed across cultural contexts. Therefore, given the influence of these cultural characteristics on students' performance on interprofessional collaboration, communication and shared decision-making, careful consideration must be given to cultural and contextual factors before and during the implementation and application of IPE [73]. If we want stakeholders to embrace interprofessional education as an integral part of the professional education curriculum, these cultural phenomena must be addressed [74]. Curriculum developers should explore which IPE learning format might best match their particular context. Moreover, in order to reduce the influence of hierarchical culture on collaboration, students should be made aware that all collaborating professions are equal. Each profession has the skills, knowledge, roles and responsibilities needed to work together in solving patient problems. The briefing activities prior to the IPE programme should include precisely these topics [4].

## 3. STRENGTHS AND LIMITATIONS

This dissertation has several strengths. First, to evaluate the implementation of PBL and CBE as learning strategies for IPE, we employed a mixed-methods design approach, presenting both qualitative and quantitative data. The design of this approach is considered a strength, because it utilises two or more data collection methods enabling us to triangulate the data to explore the underlying patterns of interest [75, 76]. Second, this dissertation adds empirical data to students

and teachers' needs assessment regarding the implementation of IPE. A limited number of studies have performed a needs assessment prior to IPE implementation, and these generally only concerned students, not teaching staff [21, 22]. Therefore, the research findings in this dissertation contribute to this topic. Third, this dissertation explores two IPE education formats and their effectiveness: PBL and CBE. The CBE model was designed especially for IPE. The findings provide additional knowledge of CBE formats that can be used for IPE, complementing the previously reported CBE designs for IPE [46, 47, 59, 77-83]. Fourth, with this dissertation we have demonstrated the influence of cultural and professional context on the implementation of IPE. This suggests that, when it comes to implementing IPE, curriculum designers should be aware not only of professional cultures, but also of the national/local culture so that they can design an IPE education format that fits their particular context best. Furthermore, this dissertation raises awareness of and sensitivity towards cultural differences in the realm of education, especially health professional education. Our results brought forward a framework of the characteristics of effective education formats, introducing cultural contexts into the implementation of IPE. It is important to develop a framework of a specific education format's characteristics so that it becomes the foundation for evaluating other appropriate education formats for IPE.

There are also several limitations to this dissertation. First, methodologically, none of the studies were comparative in terms of settings. Comparisons with other cultural contexts of IPE implementation were based on literature searches and interpretations. Most studies reported on the influence of professional culture on IPE, but none of these studied the influence of the community's culture on IPE. Second, the studies were only conducted in Indonesia, just one of many Asian countries, which limits the transferability of findings to other Asian countries. Third, although we emphasised that attention to power and hierarchy within the IPE setting is essential, the studies within this dissertation did not rise to this occasion yet. None of the studies evaluated hierarchy and power differences and how students handled interprofessional conflicts when performing IPE activities in either the PBL or CBE format. Interprofessional teamwork skills were evaluated right after students had taken part in the IPE programme using the CBE strategy. The long-term effects of the programme on students' teamwork and collaboration skills have not been explored.

## 4. IMPLICATIONS FOR PRACTICE

Based on the findings from the studies in this dissertation, we can propose some practical implications. First, the findings of this dissertation underscore the importance of conducting a needs assessment among faculty and students prior to IPE implementation. The information thus obtained should be considered as essential for deciding on the design of faculty development programmes, uni-professional briefing programmes for students, the IPE curriculum, education formats appropriate to the context, and so on.

Second, teachers in IPE should be properly prepared for their role through faculty development prior to and during the implementation of IPE. Since faculty play a crucial role as curriculum developers, learning facilitators and evaluators and managers of all IPE learning activities, they must have a better understanding of and attitudes towards IPE and IPC [28, 84]. Faculty members who are ill-equipped, uncomfortable, or unaccustomed to facilitating IPE effectively will not be able to get involved in developing and maintaining these IPE programme [85, 86]. Based on these considerations, the outcomes of IPE faculty development programmes should include the competencies to develop and sustain IPE as well as to assess and evaluate it. The literature suggests that facilitators should have expertise and experience in facilitating interprofessional small-group learning and working in an interprofessional format [27, 28, 87] and should understand the problems of power relations and hierarchy arising in the everyday collaborative practice of healthcare teams [87].

Third, while taking part in an IPE programme, students' professional identity formation needs to be addressed [88-90]. Professional identity is developed over time and is influenced by group interactions in the workplace [91]. It involves obtaining an understanding of professional practices, the building of capacities and the ethics or moral values of the profession. Such process includes individuals developing from novice to expert, growing to understand what it means to be a professional and to become the idealised professional presented to them [91]. The process is, to some extent, reliant on the presence of role models who help the novice to find their appropriate identity. These role models may appear as professionals in the workplace or as clinical teachers who teach the students during their clinical rotation [92]. Guiding students in their professional identity formation is one step to avoid self-distrust or less confidence in studying and collaborating with other professions in interprofessional education [90]. A professional identity is developed, first, through learning in uni-professional education, to be developed further in the interprofessional education programme [90, 93].

Fourth, IPE should be introduced early in students' education [4, 94]. There has been much debate on when IPE should be introduced into the health professional education programme. Introducing IPE at an early stage of the undergraduate level is beneficial since it can affect how students understand other professions so that they can develop positive attitudes and behaviours towards these other professions and interprofessional collaboration [4, 95]. Some researchers have suggested that IPE should be conducted from the early phases of undergraduate training - at least within the first two years [96]. Others, however, have argued that even though IPE can be taught from the undergraduate level, it will be more useful if implemented in a practice setting, for instance in the clinical rotation phase. In this setting, students will be eager to learn about effective collaboration. IPE in clinical settings would be more appropriate developmentally, as in the clinical phase students have already acquired professional knowledge and skills as well as a better understanding of their roles and responsibilities and collegial relationships [68]. However, implementing IPE too late might cause a risk of students having already developed professional stereotypes [97]. In developing interprofessional activities at the undergraduate or preclinical

level, interprofessional learning outcomes including the respective learning contents and process should be explicitly defined [42]. The initial focus of the IPE programme should be on what IPE is, why it is needed, its objectives and on the competencies to be achieved. In the subsequent phase, IPE activities must be carried out properly, that is, by bringing together two or more students from different professions to study with, from and about each other's professions [4, 98, 99].
Fifth, in determining the right education format, the cultural context and suggestions collected from faculty and students through needs assessment activities should be considered. The strategies should meet the criteria for effective IPE education formats, such as: learning should take place in small groups [4, 100], diversity of perspective to solve common group problems should be allowed [48], students should have the opportunity to synthesise perspectives from different professional backgrounds [44, 48, 101], the learning environment must be non-threatening enabling interactions characterised by positive attitudes [60, 102], and reflection should be promoted [55-57]. In addition, because assessment drives learning, to ensure that students strengthen group interaction and pay more attention to group collaboration performance than to their individual performance, assessments should be targeted at the collective competency of the interprofessional team rather than at individual competence. Such assessment model will encourage the achievement of the IPE objectives [103].

## 5. SUGGESTIONS FOR FUTURE RESEARCH

Based on the findings reported in this dissertation, we propose several steps for future research. First, the question remains to what extent the results of this research are transferable to other (cultural) contexts. As mentioned earlier, Indonesia is only one case in which we investigated the community's cultural influence on IPE implementation. To understand the cultural dependency in the implementation of IPE more deeply, we must examine confirmability in other similar cultural contexts [104]. Boyle (1998) explained that Indonesia, Thailand, Malaysia and other Southeast Asian countries have similar cultural concepts in society. If this assumption is correct, we can investigate the influence of the community's culture on IPE implementation in these countries as well. However, we must also view national culture as a dynamic rather than a static construct that is influenced by the education process and externalisation by individuals. Future researchers might undertake comparative studies to further examine the influence of culture on IPE implementation. Therefore, it is necessary to conduct IPE research that focuses on evaluating students' social interactions, power and conflicts during IPE activities. Concerning this, we suggest that further studies include these issues.
Moreover, the 'inequity' and power struggles that occur in health professional culture, one of which is influenced by culture, can, in fact, change along with the educational process. We therefore also welcome longitudinal studies that monitor power relation changes in health professional collaboration post IPE.

Second, assessment is still a problem within IPE. Some factors are known to be the root of problems within IPE, such as uncertainty about what to assess (e.g., individuals, groups, and/or teams), logistical problems with organising assessments for large groups of students and limited resources for IPE assessment [105]. Assessment within IPE is also complex [103] as it should focus on students' attitudes towards and readiness for IPE, profession-specific competency standards and students' interprofessional capabilities. It should also consider how to provide feedback as a basis for reflection [106, 107]. Moreover, there are some assessment challenges in IPE, including differing theoretical frameworks for assessment across professions and discipline-specific standards as mandated by each professional body [108]. Assessment of IPE was part of the pilot projects reported in Chapters 4 and 5 but not specifically studied in terms of its validity, reliability and acceptability. As the education pattern applied no longer emphasises individual collectivistic, but has shifted towards interprofessional team-based healthcare, going forward, the collective competency of the interprofessional team should be considered as the focus of IPE assessment, rather than individual competence [103].

Third, Chapters 4 and 5 of this dissertation reported problems regarding tutors/instructors' performance in facilitating PBL and CBE IPE programmes. The literature reported that, to facilitate interprofessional groups of students, tutors/facilitators of IPE should have specific knowledge and skills such as the ability to facilitate small groups and to work in an interprofessional fashion [27, 28, 87]. Additionally, they should comprehend the problems of power, hierarchy and conflict associated with healthcare collaboration [87]. Faculty development programmes in IPE are critical to improve the understanding of IPE and skills to facilitate the IPE programme and of effective clinician modelling. As such, they have the potential to improve patient care. Further research should address the optimal design of faculty development programmes focused on IPE teachers.

## CONCLUSION

Safe and effective healthcare requires interprofessional collaboration. Health professional education should address this need by implementing IPE within its undergraduate curricula. This dissertation contributes to the existing literature on IPE by advancing our understanding of students and staff's readiness for IPE within an Indonesian setting. Furthermore, by developing, implementing and evaluating two education formats for IPE, this dissertation expands the field by offering suggestions on how best to implement IPE in the form of practical implications.

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# SUMMARY

**Chapter 1** introduces the main concepts of this dissertation, discusses its background and presents its problem statement and the main research question driving the research. Interprofessional education (IPE) in undergraduate and postgraduate training has been suggested to achieve interprofessional collaborative competence. Developing an IPE programme suitable for health professional education in Indonesia requires attention not only to the potential barrier of a strong cultural hierarchy within Indonesian healthcare services, but also to variables that play a role in the implementation of any new curriculum, such as stakeholders' perceptions and involvement, the implementation strategy chosen, the educational context and the design of the programme. Successful implementation of IPE has been reported to be linked to participants' positive perceptions and to teachers having a strategic role within the programme. To determine which education format is the most suitable for the Indonesian health professional education context, several formats need piloting. Considering this, the present PhD dissertation aimed to investigate and understand the aspects that should be considered in implementing interprofessional education in the Indonesian (Asian) context. The research questions examined are: (1) What are students' and teachers' perceptions of and readiness for interprofessional education in Indonesia? (2) To what extent can problem-based learning (PBL) be considered a suitable education format for interprofessional education in Indonesia and to what extent is PBL effective as an education format for interprofessional education? (3) To what extent can a community-based education programme be considered a suitable education format for interprofessional education in Indonesia and to what extent is community-based education effective as an education format for interprofessional education? The investigation was divided into two parts: part 1) students and teachers' perceptions of and readiness for interprofessional education in Indonesia (Chapters 2 and 3), and part 2) the extent to which PBL and community-based education can be considered as suitable education formats for interprofessional education in Indonesia (Chapters 4, 5 and 6).

**Chapter 2** investigated: 1) students' readiness for IPE in an Asian context, 2) the most important factors influencing students' perceptions of IPE, 3) the reasons underlying such perceptions, and 4) the factors mitigating or promoting students' sense of readiness. We selected an explanatory, sequential mixed-methods design to answer the research questions. The Readiness for Interprofessional Learning Scale (RIPLS) was administered to 398 students from the Medical, Nursing, Midwifery and Dentistry programmes. Some factors that could potentially influence students' readiness for IPE as found in the literature were evaluated. To enhance our understanding of the responses to the RIPLS and to explore the reasons underlying them, we conducted four uni-professional focus-group discussions (FGDs). We ran a statistical analysis on the quantitative data, while performing a thematic content analysis of the qualitative data using ATLAS.ti (version 7). The study programme chosen, GPA, motivation to apply to a health professional education programme and experience of working with students from other study programmes in a student council were factors that significantly influenced the total RIPLS score.

Students were generally favourable to IPE, appreciating the opportunity it offered them to show their interprofessional leadership, collaboration and communication skills and to learn to address the problem of role blurring. Medical students' mean scores for the RIPLS questionnaire were higher than those of students from other programmes, suggesting that they were more ready for IPE compared to the other three groups. Focus groups (FGs) further revealed that: 1) early exposure to clinical practice triggered both positive and negative perceptions of IPE and of its importance to learning communication and leadership skills, 2) medical students caused insecurity and disengagement in other students, 3) medical students felt pressured to be leaders, and 4) there was a need to clarify and understand each other's profession and the boundaries of one's own profession. Although some of the students expressed pessimism towards IPE due to the hierarchical and negative collaboration in the healthcare team that they witnessed and experienced during their practice in healthcare services in general, according to the students the Asian context is ready to implement IPE, allowing health professions students in Asian countries to reap the benefits.

**Chapter 3** examined 1) health professional education faculty members' attitudes towards interprofessional collaboration (IPC) and IPE; 2) the factors affecting faculty members' perceptions of IPC and IPE; and 3) faculty members' perceptions of the factors that hamper the quality of IPC, and whether IPE is a possible remedy for the situation. A survey was administered to 549 medicine, nursing, midwifery, and dentistry faculty members from 17 institutions in Central Java Province, Indonesia. They were asked to rate their attitudes towards IPC and IPE using a previously validated 'Attitude towards Interprofessional Health Care Collaboration and Education' scale. To assist in interpreting the survey results, four uni-professional FGs were conducted and three key participants who could not be present at the FG meetings were interviewed. We conducted a statistical analysis of the quantitative data and performed a thematic content analysis of the qualitative data using ATLAS.ti (version 7). The statistical analysis revealed that the median scores differed significantly among groups and faculty characteristics. Professional background, educational background, academic title, length of employment, working collaboratively as healthcare team, institutional background, and the teaching approach used in the school appeared to be faculty characteristics that are positively associated with health professionals' attitudes towards IPC and IPE. There was no significant difference in the mean scores for all items on the 'attitude towards the negative views of campus-based IPE implementation' subscale among professions. Faculty members had positive perceptions of IPE implementation, despite their complaint concerning the challenges that would be faced during IPE implementation. The qualitative data analysis showed that health professional education teachers had negative perceptions of healthcare collaboration in hospitals, for instance within the healthcare team. Issues that they mentioned were: 1) differing perceptions of patient needs among professionals; 2) unequal participation in decision-making; 3) a lack of face-to-face interaction; and 4) overlapping roles and responsibilities. They agreed that IPE has the potential

to respond to these challenges as long as opportunities are provided to confer power and contribution equally in meeting patients' needs. The positive perception of IPE was demonstrated by the enthusiastic suggestions as to where and how IPE could be used to improve the outcomes of teaching and learning in health professional education.

**Chapter 4** explored the extent to which students demonstrate constructive collaboration during group discussion in interprofessional PBL tutorial groups. We deliberately ran a pilot project on interprofessional PBL tutorials in which 52 students from the medical, nursing and midwifery programmes participated. Four scenarios (one per week) in the area of the reproductive system were provided as topics for discussion. The background of the medical cases was interprofessional healthcare in a public health centre and the cases were problems that were commonly encountered in rural public health centres: 1) tuberculosis during pregnancy; 2) vaginal bleeding during pregnancy in a public health centre setting; 3) hyperemesis gravidarum; and 4) normal labour in a public health centre setting. Within this study, we applied an explanatory, sequential mixed-methods design to answer the research questions. First, we collected quantitative data on students' constructive collaborative activities in interprofessional PBL tutorials by observing the video recordings and filling in a previously inter-rater-reliability-checked Maastricht-Peer Activity Rating Scale (M-PARS). The results of the scale were then used as input for qualitative data collection, which was explored through uni-professional FGDs aimed to understand the underlying reasons for students' perceptions of the interprofessional PBL tutorial. We also explored students' perceptions of their own performance of constructive and collaborative activities during the interprofessional PBL tutorial. The translated M-PARS was reliable for the purpose of evaluating students' interaction during interprofessional PBL (Kappa coefficient of 0.01–0.20 and $p < 0.05$). Students actively participated during the interprofessional PBL tutorials and contributed to a better understanding, regardless of their professional background. Students were open, felt free to question and argue from the viewpoint of their own profession, and also understood their strengths and limitations. They collaborated on developing knowledge, complementing each other in answering the learning issues. They shared knowledge and learnt about each other's professions, including the boundaries and limitations of their roles. However, the statistical test of the scores for constructive and collaborative activities indicated that there was a significant difference of scores between students of the various healthcare professions ($p = 0.000$), with medical students scoring highest on both activities. Asking critical questions was not always self-evident. It was reported that the role of tutor and social status affected students' equal participation. Students' perception regarding social 'inequality' made them reluctant to criticise opinions and pose critical questions to other students. Despite the fact that students had collaborated closely for several weeks, professional barriers were still found up until the last week of meetings. They still clustered physically in accordance with their profession which pointed to insecurity. Regarding the findings, it was suggested that the PBL education format meets the aims of IPE, that is, to experience the perspectives held by others,

to listen to the way they talk about their tasks and competencies and to construct knowledge in collaboration with one another. However, it was suggested that PBL should not be the single education format applied to IPE. PBL can be applied as a starting point for students from different professions in the preclinical phase to interact in IPE. However, it should be followed by other education formats such as simulation and work-based learning approaches.

**Chapter 5** evaluated a community-based interprofessional education (CBIPE) programme by exploring students' perceptions of the CBIPE design and their group's teamwork. The Sultan Agung Community Based Interprofessional Education (SACBIPE) programme started with a one-week training course for all participants. After this course, students were divided into groups of seven, normally containing 2–3 medical and nursing students and two midwifery students. The groups were immersed in several villages in the District of Genuk, Semarang, Indonesia, for two weeks and each group was responsible for a neighbourhood community. During their stay in the community, the interprofessional groups performed activities such as conducting a community health problem survey, analysing the data to diagnose primary community health problems and determining and implementing interventions to manage the respective problems. Students presented their analysis of the community's health problem including their intervention proposals to a forum attended by the field supervisors of all programmes, the head or staff from the local public health centre and community leaders. The proposed intervention activities could include counselling and education for the community, collaboration with the community on communicable disease prevention, training voluntary community health workers in certain topics, conducting home visits for family education, and so forth. Field supervisors of the groups were lecturers from the health professions, and health professionals in charge of community healthcare service in the area, such as village midwives or nurses. At the end of the programme, the groups reflected on the whole interprofessional collaboration processes. Explanatory, sequential mixed-methods design was applied to evaluate the CBIPE programme. Quantitative data on students' self-perceived teamwork performance during the SACBIPE programme were collected applying the Interprofessional Teamwork Evaluation (ITE) questionnaire. The results of the scale were then used as input for the qualitative data collection, applying uni-professional FGDs aimed at understanding the underlying reasons for students' perceptions of teamwork and collaborative performance. Students' perceptions of the CBIPE programme were also explored during the FGs. Students reported that the three weeks of IPE activities promoted their skills to work in interprofessional teams within the community to solve the community's health problems. Although students had the opportunity to improve their communication skills during the programme, analysis of the ITE questionnaire revealed that midwifery and nursing students still experienced problems with communication and mutual support. The FGs revealed that the root of this issue was a lack of confidence and initiative in nursing and midwifery students. Medical students led all of the community-based projects, which pointed to the existence of hierarchical relationships placing doctors in the

highest position while marginalising other professions. We concluded that CBIPE seems a potentially effective way to stimulate interprofessional collaborative learning in students, although communication and leadership skills problems were still in evidence. Our research indicates that successful implementation is possible. CBIPE affords students the opportunity to learn in the context of the community and work collaboratively in interprofessional teams to stimulate their collaborative skills.

**Chapter 6** evaluated students' participation and social interaction during discussions of community health problems conducted in CBIPE. A number of 78 students from the Medical, Nursing and Midwifery programmes participated in the study. Students were randomly divided into 15 interprofessional groups consisting of 5-7 students each. The groups were immersed in Penggaron Lor village, Bangetayu District, Semarang, Central Java Province, Indonesia. Each interprofessional group was instructed to conduct a survey of community health problems, to evaluate the problems, and to plan community health services activities to address the problems. We evaluated students' participation and social interaction during the group discussions to capture the equality of contributions among professions. A content analysis was performed to explore students' participation and the type of social interaction modes performed based on the statements produced during the discussion. For this purpose, all discussions were video recorded and the conversations during the discussions were transcribed by experts. All statements produced by students during discussion were analysed for whether they could be considered as externalisation, elicitation, quick consensus, integration-based consensus or conflict-based consensus. We performed a quantitative analysis of students' participation and social interaction during discussion, by comparing the number of social interaction modes (externalisation, elicitation, quick consensus, integration-based consensus or conflict-based consensus) produced by each profession in each discussion. Externalisation was the most common type of statement produced by students during the discussion process. Students' perspectives most often reflected their scientific background and professional point of view. In most cases, consensus was reached by integrating and accommodating a variety of opinions. Conflict-based consensus would occur when group members had differing opinions on how to settle an issue that required a final decision. This type of consensus is an important element in collaborative learning and will make learners learn to be open to criticism and enable them to find a better argument to support and justify their opinion. Unfortunately, the statements associated with conflict-based consensus were the least produced by students. This finding can probably be explained by the fact that Asian culture emphasises tolerance and avoids conflict, inducing students to seek consensus by compromising and integrating all viewpoints so as to minimise conflicts. The statistical analysis indicated that there was no difference in participation, externalisation, initiative and quick consensus produced by students during the discussions of community health problems. This finding suggests that the learning model had the potential to foster equality and mutual respect among health professionals of a healthcare team as well as respect for other professions' opinion.

Similarly, this method had the potential to stimulate students from all health professional backgrounds to be confident to contribute to interprofessional discussions.

**Chapter 7** summarises and discusses the aspects that should be considered when implementing interprofessional education in an Indonesian (Asian) context. In order to answer the overall research question of this dissertation, we discussed the importance of addressing students and faculties' perceptions of IPE before executing an IPE programme, including the results and students' perceptions of the piloted learning strategies, that is, problem-based interprofessional education and community-based interprofessional education. From Chapter 2 we learnt that students were generally favourable to IPE, appreciating the opportunity it offered them to develop their interprofessional leadership, collaboration and communication skills and to learn to address the problem of role blurring. Chapter 3 reported that, according to faculty members, IPE has the potential to respond to challenges regarding IPC as long as opportunities are provided to all health professionals within the healthcare team to confer power and contribution equally in meeting patients' needs. This study underscored the need to convene faculty development programmes regarding IPC and IPE. Then, Chapters 4, 5 and 6 reported that two piloted teaching strategies - problem-based interprofessional education and CBIPE-, can be used by students to develop the skills needed for interprofessional collaboration, such as communication skills, leadership, teamwork, conflict resolution and respect for other professionals' roles. The discussion of the findings first elaborates on the need to analyse before implementing the IPE programme and to address the perceptions and attitudes of students and faculty members, which is a key factor for the success of IPE implementation. Besides, providing students and teachers with opportunities to be involved in the preparation and evaluation of the programme is crucial to foster commitment to the sustainability of the IPE programme. Second, we proposed several characteristics of effective interprofessional teaching strategies, including the use of small groups, allowing diversity of perspectives in solving common group problems, allowing students to synthesise perspectives from different professional backgrounds, creating a non-threatening learning environment to develop positive attitudes during interaction, and encouraging reflection on the learning process and collaboration. Our analysis of the two approaches - problem-based interprofessional education and CBIPE - indicated that they meet the requirements of effective teaching for IPE. Third, we discussed how professional and cultural hierarchy might influence interprofessional healthcare collaboration and hinder the implementation of interprofessional education. Unequal participation of all healthcare professionals in the decision-making process within interprofessional health professional collaboration is the norm; witnessing and experiencing that particular culture during clinical practice in the hospital in turn fed students' pessimism about the effectiveness of IPE and IPE implementation. Unfortunately, however, the majority of the IPE literature does not discuss power relations, which might indicate that IPE curriculum developers do not consider these to be a fundamental problem. Moreover, IPC and IPE might also be influenced by cultural perceptions of social hierarchy in the community.

Regarding professional rank and educational level, doctors in Indonesian society are considered to have the highest status compared to other healthcare professionals. Culturally, people are aware of their position in the hierarchy and more respect is commonly expected by and granted to people of higher status. This cultural perception, in turn, propels the domination of doctors over other healthcare professionals and influences their interactions. Cultivating the habit to respect the roles and responsibilities of other professionals, giving them equal rights to express opinions in handling patient problems within interprofessional education is expected to reduce power tensions and hierarchy within interprofessional healthcare team collaboration. Finally, the strengths and weaknesses of this dissertation as well as implications for practice and future research are discussed.

# SAMENVATTING

(Dutch summary)

**Hoofdstuk 1** introduceert het voornaamste gedachtegoed achter dit proefschrift, bespreekt de achtergrond ervan en presenteert de probleemstelling en de belangrijkste onderzoeksvraag die aan dit onderzoek ten grondslag lagen. Voor de verwerving van interprofessionele samenwerkingscompetenties wordt interprofessioneel onderwijs (IPE1) in de basis- en vervolgopleiding aanbevolen. De ontwikkeling van een IPE-programma dat geschikt is voor het gezondheidszorgonderwijs in Indonesië vraagt niet alleen om aandacht voor de mogelijkheid dat een sterke culturele hiërarchie binnen de Indonesische gezondheidszorg een belemmering vormt, maar ook voor de factoren die bij de invoering van elk curriculum een rol spelen, zoals de opvattingen en betrokkenheid van belanghebbenden, de gekozen implementatiestrategie, de onderwijscontext en de opzet van het programma. Een succesvolle implementatie van IPE wordt in verband gebracht met deelnemers die positieve opvattingen hebben en met docenten die een strategische rol binnen het programma spelen. Om erachter te komen welke onderwijsvorm het meest geschikt is voor de Indonesische gezondheidszorgonderwijscontext zullen er verschillende onderwijsvormen aan de praktijk moeten worden getoetst. Met dit in het achterhoofd beoogde dit proefschrift te onderzoeken en te begrijpen welke aspecten er bij de invoering van interprofessioneel onderwijs in een Indonesische (Aziatische) context in acht genomen moeten worden. De volgende onderzoeksvragen kwamen hierbij aan bod: 1) Hoe staan studenten en docenten tegenover interprofessioneel onderwijs in Indonesië en in welke mate zijn zij hiertoe bereid? 2) In hoeverre kan probleemgestuurd onderwijs (PGO) beschouwd worden als een geschikte onderwijsvorm voor interprofessioneel opleiden in Indonesië en in hoeverre is PGO een effectieve onderwijsvorm voor dit doel? 3) In hoeverre kan een gemeenschapsgericht onderwijsprogramma beschouwd worden als een geschikte onderwijsvorm voor interprofessioneel opleiden in Indonesië en in hoeverre is gemeenschapsgericht onderwijs een effectieve onderwijsvorm voor dit doel? Het onderzoek werd in twee delen opgedeeld: deel 1) de percepties van studenten en docenten ten aanzien van interprofessioneel onderwijs in Indonesië en hun bereidheid daartoe (Hoofdstuk 2 en 3); en deel 2) in hoeverre PGO en gemeenschapsgericht onderwijs beschouwd kunnen worden als geschikte onderwijsvormen voor interprofessioneel opleiden in Indonesië (Hoofdstuk 4 t/m 6).

In **Hoofdstuk 2** onderzochten we: 1) de bereidheid van studenten tot IPE in een Aziatische context; 2) de belangrijkste factoren die van invloed zijn op de opvattingen die studenten hebben over IPE; 3) de motivatie achter deze opvattingen; en 4) de factoren die de bereidheid van studenten matigen dan wel bevorderen. Om deze onderzoeksvragen te beantwoorden, kozen we voor een verklarende, sequentiële multimethodische onderzoeksopzet. We lieten 398 studenten Geneeskunde, Verpleegkunde, Verloskunde en Tandheelkunde de RIPLS2, een vragenlijst over hun bereidheid tot interprofessioneel leren, invullen. Daarmee toetsten we enkele factoren uit de literatuur die mogelijk de bereidheid van studenten tot IPE beïnvloeden. Om ons begrip van de antwoorden op de RIPLS te vergroten en om de motivatie erachter te onderzoeken, hielden we vier uniprofessionele focusgroepgesprekken. Met behulp van ATLAS.

ti (versie 7) onderwierpen we de kwantitatieve data aan een statistische analyse en verrichtten we een thematische analyse van de kwalitatieve data. De gekozen opleiding, het gemiddelde eindcijfer, de motivatie achter de aanmelding voor een opleiding in de gezondheidszorg en ervaring met het werken met studenten uit andere opleidingen in een studentenraad waren factoren die de totaalscore voor de RIPLS aanzienlijk beïnvloedden. Over het algemeen stonden de studenten positief tegenover IPE en waardeerden zij de kans die het hun bood om hun vaardigheden op het gebied van interprofessioneel leiderschap, samenwerken en communicatie te laten zien en om te leren omgaan met verwarring over eenieders taak. Geneeskundestudenten hadden gemiddeld hogere scores op de RIPLS-vragenlijst dan studenten van de overige opleidingen, hetgeen aannemelijk maakt dat zij in vergelijking met de drie andere groepen meer bereid waren tot IPE. Uit de focusgroepen bleek verder nog dat: 1) vroegtijdige blootstelling aan de klinische praktijk leidde tot zowel positieve als negatieve percepties van IPE en van het belang ervan voor de verwerving van communicatieve en leiderschapsvaardigheden; 2) Geneeskundestudenten de andere studenten onzeker maakten en ervoor zorgden dat zij teruggetrokken waren; 3) Geneeskundestudenten het gevoel hadden dat zij werden geacht leiders te zijn; en 4) studenten de behoefte hadden aan uitleg en een beter begrip van elkaars beroep en de grenzen van hun eigen beroep. Hoewel enkele studenten zich pessimistisch uitlieten over IPE vanwege de hiërarchische en negatieve samenwerking in het zorgteam die zij in de algemene zorgpraktijk hadden aanschouwd en ervaren, is de Aziatische context volgens de studenten klaar voor de invoering van IPE, zodat zorgstudenten in Aziatische landen er de vruchten van kunnen plukken.

**Hoofdstuk 3** belichtte: 1) de opstelling van stafleden van gezondheidszorgopleidingen ten aanzien van interprofessioneel samenwerken (IPC3) en IPE; 2) de factoren die van invloed zijn op de opvattingen die stafleden hebben over IPC en IPE; en 3) de percepties van stafleden ten aanzien van de factoren die de kwaliteit van IPC ongunstig beïnvloeden en of IPE een mogelijke oplossing zou zijn voor deze situatie. We namen een vragenlijst af bij 549 stafleden van de opleiding Geneeskunde, Verpleegkunde, Verloskunde en Tandheelkunde aan 17 instellingen in de provincie Midden-Java, Indonesië. Daarin werd hun gevraagd om met behulp van een reeds gevalideerde schaal (de Attitude towards Interprofessional Health Care Collaboration and Education scale) hun opstelling ten aanzien van IPC en IPE te beoordelen. Om de resultaten van dit onderzoek beter te kunnen interpreteren, werden er vier uniprofessionele focusgroepen gehouden en werden drie belangrijke participanten die niet aan deze gesprekken hadden kunnen deelnemen, geïnterviewd. Met behulp van ATLAS.ti (versie 7) onderwierpen we de kwantitatieve data aan een statistische analyse en verrichtten we een thematische analyse van de kwalitatieve data. Uit de statistische analyse bleek dat de mediaanscores significant verschilden tussen de groepen en de kenmerken van stafleden. Er bleek een positief verband te bestaan tussen stafgebonden kenmerken als professionele achtergrond, opleiding, academische titel, dienstduur, samenwerken binnen een zorgteam, instelling en de onderwijsmethode van de betreffende opleiding enerzijds

en de opstelling van de zorgprofessionals ten aanzien van IPC en IPE anderzijds. Tussen de beroepsgroepen was er geen significant verschil in hun gemiddelde scores voor alle items van de subschaal over de opstelling van stafleden ten aanzien van negatieve percepties van de invoering van IPE op de universiteit/hogeschool. Stafleden stonden positief tegenover de invoering van IPE, ondanks dat ze klaagden dat een dergelijke invoering hen voor diverse uitdagingen zou stellen. Uit de kwalitatieve data-analyse bleek dat docenten van gezondheidszorgopleidingen negatieve percepties hadden van de samenwerking in de zorg in ziekenhuizen, bijvoorbeeld binnen het zorgteam. Punten die zij noemden waren: 1) professionals verschilden van mening over wat patiënten nodig hadden; 2) ongelijke deelname aan de besluitvorming; 3) een gebrek aan persoonlijk contact; en 4) overlappende taken en verantwoordelijkheden. Ze waren het erover eens dat IPE kon bijdragen aan de oplossing van deze problemen, mits er in het programma kansen werden geboden om bij het voorzien in de behoeften van patiënten macht en bijdragen gelijk te verdelen. Dat stafleden positief tegenover IPE stonden, bleek uit de enthousiaste suggesties over waar en hoe IPE kon worden ingezet om de eindkwalificaties van het onderwijs en leren in de gezondheidszorgopleiding te verbeteren.

**Hoofdstuk 4** onderzocht in welke mate studenten laten zien dat zij tijdens de groepsdiscussie in interprofessionele PGO-groepen constructief samenwerken. Hiertoe hebben we speciaal een pilotproject over interprofessionele PGO-groepen uitgevoerd waaraan 52 studenten van de opleiding Geneeskunde, Verpleegkunde en Verloskunde deelnamen. Er werden vier scenario's (een per week) op het gebied van het voortplantingsstelsel ter discussie aangereikt. De medische casussen gingen over interprofessionele zorg in een zorgkliniek en beschreven problemen die vaak voorkwamen in dergelijke klinieken op het platteland: 1) tuberculose tijdens de zwangerschap; 2) vaginaal bloedverlies tijdens de zwangerschap in een zorgklinieksetting; 3) hyperemesis gravidarum (zwangerschapsbraken); en 4) een normale bevalling in een zorgkliniek. Om de onderzoeksvragen van deze studie te beantwoorden, pasten we een verklarende, sequentiële multimethodische onderzoeksopzet toe. Eerst hebben we kwantitatieve data verzameld over de constructieve samenwerkingsdynamiek tussen studenten tijdens interprofessionele PGO-discussies door de video-opnames te bekijken en een reeds op interbeoordelaarsbetrouwbaarheid gecheckte Maastrichtse vragenlijst in te vullen, de zogenaamde Maastricht-Peer Activity Rating scale (M-PARS). Dit instrument was oorspronkelijk ontwikkeld om te onderzoeken of studenten in staat zijn om de cognitieve, sociale en motivationele bijdragen van hun onderwijsgroepsgenoten te evalueren. De uitkomst van deze vragenlijst diende vervolgens als input voor de kwalitatieve dataverzameling die bestond uit uniprofessionele focusgroepgesprekken waarmee we een beter begrip trachtten te verkrijgen van de motivatie achter de percepties die studenten hadden van de interprofessionele PGO-groep. We onderzochten ook hoe studenten tegen hun eigen deelname aankeken wat betreft de constructieve bijdragen die zij leverden en qua samenwerking tijdens de interprofessionele PGO-groep. De vertaalde M-PARS was een betrouwbaar instrument voor het beoordelen van de

groepsinteractie tijdens interprofessioneel PGO (Cohen's kappa van 0,01–0,20 en $p < 0,05$). Studenten namen actief deel tijdens de interprofessionele PGO-discussies en droegen bij aan een beter begrip, ongeacht welke opleiding zij volgden. Studenten waren open, voelden zich vrij om vragen te stellen en om vanuit hun eigen vakgebied te discussiëren en begrepen ook hun eigen sterke en zwakke punten. Ze werkten samen aan het ontwikkelen van kennis en vulden elkaar aan bij het beantwoorden van de leervragen. Ze deelden kennis en leerden over elkaars vakgebied, inclusief de grenzen en beperkingen van hun taken. De statistische toets van de scores op de constructieve en samenwerkingsactiviteiten gaven echter aan dat de scores significant verschilden tussen de studenten van de diverse gezondheidszorgopleidingen ($p = 0,000$), waarbij Geneeskundestudenten het hoogst scoorden op beide activiteiten. Het was niet altijd vanzelfsprekend om kritische vragen te stellen. Studenten gaven aan dat de tutor en sociale status van invloed waren op de gelijke deelname binnen de groep. De percepties van studenten ten aanzien van deze sociale "ongelijkheid" maakten dat zij terughoudend waren met het bekritiseren van elkaars mening en het stellen van kritische vragen aan andere studenten. Hoewel studenten wekenlang intensief hadden samengewerkt, werden er tot op de laatste bijeenkomstweek nog vakgebonden drempels geconstateerd.
Ze gingen nog steeds in groepjes van dezelfde opleiding bij elkaar zitten, wat duidde op onzekerheid. Gezien de bevindingen, werd verondersteld dat de PGO-onderwijsvorm beantwoordt aan de doelstellingen van IPE, namelijk om andermans standpunt te ervaren, om te luisteren naar de manier waarop zij over hun taken en competenties spreken en om in samenwerking met elkaar kennis op te bouwen. Er werd echter aanbevolen om PGO niet als enige onderwijsvorm toe te passen bij IPE. PGO kan in de preklinische fase worden toegepast zodat studenten van verschillende opleidingen alvast kennis kunnen maken met samenwerken in IPE. Het zou echter gevolgd moeten worden door andere onderwijsvormen zoals simulatie en werkplekleren.

In **Hoofdstuk 5** werd een gemeenschapsgericht interprofessioneel onderwijsprogramma (CBIPE4-programma) geëvalueerd door de opvattingen die studenten hebben over de opzet van dit programma en over het teamwerk binnen hun groep te onderzoeken. Het Sultan Agung gemeenschapsgericht interprofessioneel onderwijsprogramma (SACBIPE5-programma) ging van start met een één week durende training voor alle deelnemers. Na deze training werden de studenten ingedeeld in groepjes van zeven, meestal bestaande uit twee à drie Geneeskunde- en Verpleegkundestudenten en twee Verloskundestudenten. Gedurende twee weken werden de groepen ondergedompeld in diverse dorpen van het sub-district Genuk, Semarang, Indonesië, waarbij elke groep verantwoordelijk was voor een buurtgemeenschap. Tijdens hun verblijf in de gemeenschap verrichtten de interprofessionele groepen allerlei activiteiten zoals het uitvoeren van een onderzoek naar de gezondheidsproblemen in de gemeenschap, het analyseren van de aldus verkregen data teneinde de voornaamste gezondheidsproblemen in de gemeenschap in kaart te brengen en het bedenken en invoeren van interventies die de betreffende problemen

hielpen aanpakken. De studenten presenteerden hun analyse van de gezondheidsproblemen binnen de gemeenschap, samen met hun voorgestelde interventies, aan een forum waaraan de zorgveldsupervisors van alle opleidingen, het hoofd of enkele stafleden van de plaatselijke zorgkliniek en gemeenschapsleiders deelnamen. Voorbeelden van dergelijke voorgestelde interventieactiviteiten konden zijn: het begeleiden en geven van voorlichting aan de gemeenschap, met de gemeenschap samenwerken aan de preventie van infectieziekten, vrijwillige hulpverleners binnen de gemeenschap in bepaalde onderwerpen trainen, het afleggen van huisbezoeken om gezinnen voor te lichten, enzovoort. De zorgveldsupervisors van de groepen waren docenten uit beroepen in de zorg en zorgprofessionals die verantwoordelijk waren voor hulpverlening aan de gemeenschap in het gebied, zoals dorpsverloskundigen of -verpleegkundigen. Aan het einde van het programma reflecteerden de groepen op het hele proces van interprofessionele samenwerking. Voor de evaluatie van het CBIPE-programma pasten we een verklarende, sequentiële multimethodische onderzoeksopzet toe. Met behulp van de ITE6-vragenlijst, een vragenlijst voor het beoordelen van interprofessioneel teamwerk, verzamelden we kwantitatieve data over hoe studenten zelf vonden dat zij gedurende het SACBIPE-programma binnen het team samenwerkten. De uitkomst van deze vragenlijst diende vervolgens als input voor de kwalitatieve dataverzameling waarbij we uniprofessionele focusgroepgesprekken hielden om een beter begrip te verkrijgen van de motivatie achter de percepties die studenten hadden van hun prestaties ten aanzien van teamwerk en samenwerken. Tijdens deze focusgroepen gingen we ook nader in op de opvattingen die studenten hadden over het CBIPE-programma. Studenten gaven aan dat zij door drie  weken lang IPE-activiteiten te verrichten beter in staat waren om binnen de gemeenschap in interprofessionele teams te werken om de gezondheidsproblemen van die gemeenschap op te lossen. Hoewel het programma studenten de kans bood om hun communicatieve vaardigheden te verbeteren, wees de analyse van de ITE-vragenlijst uit dat Verloskunde- en Verpleegkundestudenten nog steeds moeite hadden met communicatie en wederzijdse steun. Uit de focusgroepen bleek dat een gebrek aan vertrouwen en initiatief onder Verpleegkunde- en Verloskundestudenten hieraan ten grondslag lag. Alle gemeenschapsprojecten werden geleid door Geneeskundestudenten, wat duidde op het bestaan van hiërarchische verhoudingen waarbij artsen de hoogste positie innamen en de andere beroepen werden gemarginaliseerd. We concludeerden dat CBIPE een mogelijk effectieve manier lijkt om interprofessioneel samenwerkend leren onder studenten te bevorderen, hoewel sommige studenten nog steeds problemen hadden met communicatieve en leiderschapsvaardigheden. Ons onderzoek wijst erop dat een succesvolle implementatie mogelijk is. Het CBIPE-programma biedt studenten de kans om binnen een gemeenschap te leren en in interprofessionele teams samen te werken en zodoende hun samenwerkingsvaardigheden te verbeteren.

In **Hoofdstuk 6** werd de participatie en mate van sociale interactie van studenten bij het bespreken van de gezondheidsproblemen in de gemeenschap gedurende het CBIPE-programma onder de loep genomen. Aan deze studie namen 78 studenten van de opleiding Geneeskunde,

Verpleegkunde en Verloskunde deel. Studenten werden willekeurig ingedeeld in 15 interprofessionele groepen van elk 5 à 7 studenten. De groepen werden ondergedompeld in het dorp Penggaron Lor van het district Bangetayu, Semarang, in de provincie Midden-Java, Indonesië. Elke interprofessionele groep kreeg de opdracht om een onderzoek te verrichten naar de gezondheidsproblemen binnen de gemeenschap, om deze problemen te beoordelen, en om zorgactiviteiten op te zetten die de problemen binnen de gemeenschap hielpen aanpakken. Om te kunnen nagaan in hoeverre er sprake was van een gelijke inbreng onder de verschillende opleidingen, beoordeelden we de participatie en mate van sociale interactie van studenten tijdens de groepsdiscussies. Op basis van de uitspraken die tijdens de discussie werden gedaan, verrichtten we een inhoudsanalyse met het doel de participatie van studenten en de vormen van sociale interactie die zij gebruikten in kaart te brengen. Hiertoe werden alle discussies op video opgenomen en werden alle gesprekken tijdens deze discussies door deskundigen getranscribeerd. Alle uitspraken die de studenten tijdens de discussie deden, werden geanalyseerd op de mate waarin zij beschouwd konden worden als vorm van externaliseren, eliciteren, snelle consensusvorming en consensusvorming door perspectieven te integreren of door meningsverschillen te boven te komen. Van de mate waarin studenten tijdens de discussie participeerden en van hun sociale interactie verrichtten we een kwantitatieve analyse door het aantal per opleiding geuite vormen van sociale interactie (externaliseren, eliciteren, snelle consensusvorming en consensusvorming door perspectieven te integreren of door meningsverschillen te boven te komen) in elke discussie met elkaar te vergelijken. Het meest voorkomende type uitspraak dat studenten tijdens het discussieproces deden was externaliseren. Het standpunt dat studenten innamen was vaak een weerspiegeling van hun wetenschappelijke achtergrond en professionele zienswijze. In de meeste gevallen bereikten de studenten overeenstemming (consensus) door hun diverse meningen met elkaar te integreren en te harmoniseren. Van "consensusvorming door meningsverschillen te boven te komen" was sprake wanneer de groepsleden van mening verschilden over hoe een kwestie waarvoor een definitief besluit nodig was, moest worden opgelost. Dit soort consensus is een belangrijk onderdeel van samenwerkend leren omdat het studenten leert open te staan voor kritiek en in staat stelt om hun mening met betere argumenten te onderbouwen en te verdedigen. Helaas werden de uitspraken die met dit soort consensus samenhingen het minst gedaan door studenten. Deze bevinding kan waarschijnlijk worden verklaard door het feit dat de Aziatische cultuur tolerantie en het vermijden van conflicten vooropstelt, waardoor studenten ertoe worden aangezet om door zich te schikken en hun standpunten te integreren tot een overeenstemming te komen en zo conflicten tot een minimum te beperken. De statistische analyse gaf aan dat er onder de studenten geen verschillen bestonden in de mate van participeren, externaliseren, initiatief tonen en snelle consensusvorming die zij bij het bespreken van de gezondheidsproblemen in de gemeenschap lieten zien. Deze bevinding maakt aannemelijk dat het leermodel de mogelijkheid biedt om gelijkheid en wederzijds respect onder zorgprofessionals binnen een zorgteam te bevorderen, evenals respect voor de zienswijze van andere beroepen. Tevens bood deze

onderwijsvorm de mogelijkheid om studenten van alle studierichtingen in de zorg te stimuleren om zelfverzekerd bij te dragen aan interprofessionele discussies.

In **Hoofdstuk 7** worden de aspecten die bij de invoering van interprofessioneel onderwijs in een Indonesische (Aziatische) context in acht genomen moeten worden, samengevat en besproken. Als antwoord op de overkoepelende onderzoeksvraag van dit proefschrift bespraken we hoe belangrijk het is om vóór het ten uitvoer brengen van een IPE-programma de opvattingen van studenten en stafleden over IPE aan de orde te stellen, alsmede de resultaten van de aan de praktijk getoetste leerstrategieën, namelijk probleemgestuurd en gemeenschapsgericht interprofessioneel opleiden, en de opvattingen die studenten hierover hebben. Van Hoofdstuk 2 leerden we dat de studenten over het algemeen positief tegenover IPE stonden en dat zij de kans waardeerden die het hun bood om hun vaardigheden op het gebied van interprofessioneel leiderschap, samenwerken en communicatie te ontplooien en om te leren omgaan met verwarring over taken. In Hoofdstuk 3 werd geconstateerd dat stafleden van mening waren dat IPE bestaande problemen met IPC mogelijk kon verhelpen, mits alle zorgprofessionals van het zorgteam in het programma de kans kregen om bij het voorzien in de behoeften van patiënten de macht en bijdragen gelijk te verdelen. Deze studie onderstreepte de noodzaak om specifiek op IPC en IPE gerichte docentprofessionaliseringsprogramma's te organiseren. Hoofdstuk 4 t/m 6 wezen vervolgens uit dat twee aan de praktijk getoetste onderwijsmethodes, namelijk probleemgestuurd interprofessioneel opleiden en CBIPE, door studenten gebruikt kunnen worden om de vaardigheden te ontplooien die voor interprofessioneel samenwerken vereist zijn, zoals communicatieve vaardigheden, leiderschap, werken in een team, het oplossen van conflicten en respect hebben voor de taken van andere professionals. Bij het bespreken van de bevindingen wordt eerst ingegaan op de noodzaak om vóór de invoering van het IPE-programma een grondige analyse te verrichten en om te focussen op de opvattingen en opstellingen van studenten en stafleden, wat een wezenlijke factor is voor het welslagen van IPE-implementatie. Behalve dat is het van cruciaal belang dat studenten en docenten de kans krijgen om bij de voorbereiding en evaluatie van het programma betrokken te zijn, teneinde hun betrokkenheid bij de instandhouding van het IPE-programma te bevorderen. Ten tweede droegen we diverse kenmerken aan die interprofessionele onderwijsstrategieën effectief maken, zoals het gebruik van kleine groepen, het toestaan van meningsverschillen bij het oplossen van gebruikelijke groepsproblemen, studenten toestaan om zienswijzen van verschillende professionele achtergronden met elkaar te verenigen, een niet-bedreigende leeromgeving scheppen die een positieve houding tijdens interactie bevordert en het stimuleren van reflectie op het leerproces en de samenwerking. Onze analyse van de twee benaderingen, probleemgestuurd interprofessioneel opleiden en CBIPE, gaf aan dat zij voldoen aan de eisen die aan effectieve onderwijsstrategieën voor IPE worden gesteld. Ten derde bespraken we hoe de heersende professionele en culturele hiërarchie mogelijk van invloed is op de interprofessionele samenwerking in de zorg en de invoering van interprofessioneel onderwijs zou kunnen belemmeren. De huidige norm ten aanzien van

interprofessionele samenwerking onder zorgprofessionals is dat alle zorgprofessionals in ongelijke mate aan het besluitvormingsproces deelnemen; het aanschouwen en ervaren van deze specifieke cultuur tijdens de klinische praktijk in het ziekenhuis wakkerde op zijn beurt het pessimisme onder studenten over de effectiviteit van IPE en de invoering ervan verder aan. Jammer genoeg wordt er in het overgrote deel van de literatuur over IPE echter niet ingegaan op machtsverhoudingen, hetgeen er mogelijk op wijst dat ontwikkelaars van IPE-curricula deze niet als een fundamenteel probleem beschouwen. Bovendien worden IPC en IPE mogelijk ook beïnvloed door culturele percepties van de sociale hiërarchie die binnen de gemeenschap heerst. Wat betreft professionele rang en opleidingsniveau, genieten artsen in de Indonesische maatschappij de hoogste status vergeleken met andere zorgprofessionals. Cultureel gezien zijn mensen zich bewust van hun plaats in de hiërarchie en is het gebruikelijk dat mensen met een hogere status meer respect verwachten en dit ook ontvangen. Deze culturele perceptie zorgt er op haar beurt voor dat artsen over andere zorgprofessionals domineren en beïnvloedt hun interacties. Door met behulp van interprofessioneel opleiden studenten de gewoonte aan te leren om respect te hebben voor de taken en verantwoordelijkheden van andere professionals en hun gelijke rechten te geven om hun mening te uiten bij het behandelen van patiëntproblemen zal naar verwachting de interprofessionele samenwerking in het zorgteam minder verstoord worden door de bestaande hiërarchie en spanningen als gevolg van machtsverschillen. Tot slot worden de sterke en zwakke punten van dit proefschrift besproken, alsmede de gevolgen voor de praktijk en toekomstig onderzoek.

# IMPACT

## RELEVANCE

The healthcare system is becoming increasingly complex, requiring healthcare professionals to possess key competencies such as effective communication skills, teamworking abilities and the capacity to collaborate with other healthcare professionals in teams. Health professional education (HPE) institutions must prepare future healthcare professionals for their role in these interprofessional healthcare teams by offering interprofessional education (IPE). Several ministries in Indonesia acknowledged this need, including the Ministry of National Education (MONE) through the Directorate General of Higher Education (DGHE), and the Ministries of National Health and Religious Affairs. In Indonesia, thousands of health professionals graduate from health professional schools each year. IPE occurs when students from two or more health professional programmes learn with, from and about each other's professions and has been recommended for the training of healthcare professional students.
Nevertheless, designing effective IPE within health professional education requires specific attention to various factors that might inhibit sustainable IPE implementation, including leadership, coordination and organisation among health education programmes and schools, the health professional education curriculum which is quite packed, undermining flexibility and change, scheduling, logistics, and students and faculty members' attitudes towards interprofessional collaboration (IPC) and education. As a result, most IPE courses existing in Indonesia and some other countries are just optional and only a few of them have been sustainably implemented in the health professional curricula. Therefore, the results presented in this dissertation provide direction on how to implement IPE sustainably and offer suggestions on potential education formats for effective IPE.

## TARGET GROUPS

There are several target groups that benefit from the results of this dissertation: health professional curricula and their leaders, faculty teaching within these curricula, the students of these curricula, and the healthcare facilities in which the students will work.
Implementation of IPE is difficult as it requires curriculum change, coordination among healthcare professional education programmes, a lot of logistics and resources, as well as positive attitudes of students and faculty members towards IPE. Consequently, many health professional education institutions have decided not to initiate IPE implementation yet, because coordination among programmes cannot be achieved and faculty members do not support the implementation of IPE. Moreover, some programmes cannot afford the logistics required to run IPE. The studies reported provide direction on how IPE could be successfully implemented within an Indonesian context by addressing students and faculty members' perceptions of IPE and evaluating two education formats for IPE: problem-based Learning (PBL) and community-based education

(CBE). Part of this dissertation was concerned with the actual development and implementation of the learning activities and learning tools such as modules and with validating evaluation tools for interprofessional PBL and CBE formats. As IPE is still new in Indonesia, so far there is no standard model for an education format that can be used as a reference for HPE institutions throughout Indonesia. The education formats and tools produced during these studies hopefully can inspire other health professional institutions in Asia in general and in Indonesia in particular to initiate and implement an IPE programme.

Furthermore, this dissertation shed light on the importance of addressing faculty perceptions of IPE as a key ingredient for successful and sustainable IPE implementation. As faculty members will play very significant roles in designing the curriculum, and facilitating and assessing learning in IPE, they should have a good understanding of the concept of IPE and good interprofessional healthcare team collaboration abilities. The findings also highlighted the fact that students learn from observing how healthcare teams collaborate in clinical practice. This finding can motivate all faculty members in both the preclinical and clinical phase to become role models of and perform good healthcare team collaboration in school as well as in clinical settings.

From the study findings we learnt that students were less confident when collaborating with medical and dentistry students, both in interprofessional PBL and in community-based interprofessional education (CBIPE). These findings can be a reference for HPE institutions to make efforts to bolster student confidence by increasing their respective knowledge and clinical skills and providing leadership education. Leadership education can be implemented uni-professionally through the HPE curriculum. Moreover, leadership skills can also be fostered by means of extracurricular activities that require various health professional students to work together to carry out activities. Getting students from various professions accustomed to interacting with each other and working together in various activities will at least increase the confidence, interpersonal closeness and trust that collaboration requires.

The findings also indicated that CBIPE stimulates students' collaboration and teamwork skills. CBIPE involves many community health services such as community counselling and education which are considered the responsibility of the public health centre. Considering these findings, healthcare professionals at the respective public health centres can be involved in CBIPE learning activities. To qualify for such involvement, however, they must understand the concepts of IPE and IPC so that they can become role models for interprofessional collaboration in public services, because their collaboration as a healthcare team will be seen, learnt and experienced by students of all health professional backgrounds.

To ensure that HPE institutions implement IPE within the HPE curriculum, and to ensure that IPE is properly implemented with the aim to stimulate student collaboration skills, the accreditation body of HPE institutions, the Indonesian Accreditation Agency for Higher Education in Health, can consider making the implementation of IPE a standard to be evaluated as part of the institutional accreditation process.

## ACTIVITIES / PRODUCTS

The IPE education formats that were applied in these studies, namely interprofessional PBL and Sultan Agung community-based IPE, along with all the learning materials, evaluation tools and questionnaires that have been translated into Indonesian and have been validated, are accessible from the https://fkunissula.ac.id website and can be used by other HPE institutions in Indonesia or other Asian countries to initiate IPE implementation.
The author presented the research findings of this dissertation during workshops and faculty development programmes on IPE at several HPE institutions in Indonesia. The author also presented the findings of her research in various national and international conferences and webinars. The materials presented in the workshops, conferences and seminars are expected to inspire faculty members and staff from other HPE institutions in Indonesia attending the workshops or conferences to initiate IPE implementation.

## INNOVATION

This dissertation resulted in the design of two important educational innovations: interprofessional PBL and interprofessional CBE fit for the Indonesian context.
PBL is reported to be an effective education format for gaining knowledge. PBL is experiential, reflective and designed to be interactive and affords students the opportunity to discuss, argue, present and hear their group members' viewpoints, thereby contributing to students' intellectual growth. However, so far PBL has mostly been used in a uni-professional context only. The application of PBL in IPE programmes has not been previously reported in Indonesia, nor is it widely diffused in Asia, so the use of PBL in IPE can also be considered innovative.
The IPE literature in the Asian context reported that the education format most commonly used for IPE is interprofessional CBE which takes a variety of designs. Sultan Agung community-based interprofessional education (SACBIPE) is innovative as it combines classroom training with various interprofessional health services in the communities, from surveying the community health problems to planning and implementing intervention projects aimed to solve the respective health problems. Its various activities range from counselling, education and home visits to community service, enabling students to develop various skills such as leadership, communication, problem-solving, planning, division of tasks and conflict management skills.

## IMPLEMENTATION

The research in this dissertation has informed the implementation of IPE in Sultan Agung Islamic University, the institution where the author serves and where IPE has been implemented since

2016. Since 2014, the Directorate General of Higher Education of the Ministry of National Education (MONE) and the Ministry of National Health have socialised and promoted the importance of IPE to all health professional education institutions in Indonesia. In 2014, the Directorate General of Higher Education of MONE also supported the initiation of the Indonesian Young Health Professionals' Society (IYHPS) in organising the 'Nusantara Health Collaborative' (NHC) programme which aims to foster an understanding of education and interprofessional collaboration among students and young health professionals across the archipelago. It is hoped that within the next two or three years, HPE institutions in Indonesia will implement IPE in their HPE curriculum taking into account their strengths, resources and context. The Indonesian Accreditation Agency for Higher Education in Health has included standards for implementing IPE in HPE institutions since 2020. These standards will be used to assess IPE implementation in HPE institutions in the next two or three years.

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# CURRICULUM VITAE

**Endang Lestari** was born on July 2nd, 1971 in Pati, Central Java, Indonesia. She attended Faculty of Language and Culture Universitas Diponegoro in Semarang where she graduated in 1996. Directly thereafter she started working as teacher at Faculty of Medicine Universitas Islam Sultan Agung in Semarang. She started studying at Master program of Education at Universitas Negeri Semarang, where she graduated in 2003. In 2006 she started studying at Master program of Medical Education at Universitas Indonesia in Jakarta, and she graduated in 2008. Since 2005 to 2013 she became the secretary of Medical Education Unit of faculty of Medicine Universitas Islam Sultan Agung where she had to be responsible with handling the implementation of PBL curriculum at the institution. Since 2015 to 2020 she became the head of IPE Team in the university. Together with her team, she was in charge with the pilot project of IPE implementation, curriculum development and implementation of IPE, faculty development program activities on IPE and the introduction of IPE to staffs within the university. Since 2017 up to the present she has been the head of Quality Assurance Unit of Faculty of Medicine Universitas Islam Sultan Agung. She has done a number of consultancies on topics of quality assurance in higher education. She also acts as the head of Medical Education and Interprofessional Education Research Center where she coordinates researches in the area of Medical Education and interprofessional education, management and teaching activities.

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