

The Process and Implication of Inter-Professional Education: A Systematic Review

Dewi Prabawati¹

¹*Sint Carolus School of Health Sciences, Jakarta, Indonesia*
Corresponding Author: Dewi Prabawati (deprab24@yahoo.com)

ABSTRACT

Background: The practice of inter-professional education (IPE) is expanding rapidly especially in the developing countries. The goal of IPE is to develop knowledge, skills, and attitudes that result in effective Inter-professional (IP) team behaviors and competency. Therefore, it is essential to understand more about the activity, other professional's involvement and its implications for nursing students and institutions.

Purpose: This paper aimed to review the process and other professional's involvement in IPE's nursing education, and describe the implication after implementing IPE for nursing students and institution.

Methods: A comprehensive multi-step search of the literature in IPE using ProQuest, EBSCO and Cengage databases was performed. Samples of 19 studies met the inclusion criteria and were used in this study.

Results: None of the studies reported findings from developing country, while there were only two studies conducted in Asia. IPE programs utilize a variety of combinations of interactive learning methods, such as group problem solving, focus group interview, social networking (website), and simulated patient or simulated based training (SBT) which is becoming the most common methods employed. IPE gives benefits for the students, such as improving communication skills, recognizing the role and responsibilities, understanding the value and ethics and also increasing teamwork and team-based care.

Conclusion: Despite the limitations, this systematic review found a number of activities and other professionals that can be involved with nursing in the IPE implementation. It also found out that IPE applied in a variety of clinical settings is well received by the students and enable them to learn the knowledge and skills for collaborative learning.

Keywords: Implications; Inter-professional education; nursing education

BACKGROUND

Based on WHO report, Inter-professional education (IPE) occurs when two or more professions learn as one, be a partner with to enable effective collaboration and improve health outcomes (Gilbert, Yan & Hoffman, 2010). The goal of this effort is to develop knowledge, skills, and attitudes that result in effective inter-professional (IP) team behaviors and competence (Buring et al., 2009). Ideally, students' exposure and practice of effective communication skills and teamwork strategies should be interlinked throughout their education. For the students, IPE gives the experience to learn how to act

as part of an inter-professional team and incorporate the knowledge and skills for their future practice.

Inter-professional education is an effective method to develop collaboration among health workers of different profession. Among the students, IPE is a useful strategy to help change the attitudes, develop their interest in patient care and improve their medical and clinical knowledge (Shunguya, Hinthong, Jimba & Yosuka, 2014). Many studies have reported that IPE led to positive changes in the students' knowledge or skills of inter-professional (IP) collaboration related to their enhanced understanding of the roles and responsibilities of other professional groups (Burford et al, 2013; Wilbur & Kelly, 2015), improved knowledge of the nature of IP collaboration (Thuente, 2014; Zanoti & Canova, 2015) and development of communications skills (Defenbaugh & Chikotas, 2015; Lancken & Levenhagen, 2014).

In developing country, especially in Indonesia, IPE program is very rare at nursing schools. Even some of the faculty members claimed that they have heard about IPE, many do not understand the benefits and how to apply it. Therefore, it is necessary to conduct a systematic review to explore the process and implication of IPE. It is expected, that further understanding of IPE will give benefits to improve patient care and professional satisfaction in the future. In addition, reviews of related studies can bring findings to produce a more comprehensive understanding of the IPE and will be able to identify gaps in that field and guidelines for future activities.

PURPOSE

This systematic review aimed to (1) identify the studies conducted in the implementation of IPE and its activities, (2) identify the other professions involved with nursing in the implementation of IPE, and (3) describe the implication after the implementation of IPE for nursing students and institutions.

METHODS

The systematic review was conducted to learn more and examine an analysis of critical assessment while initiating and implementing IPE in various settings. The author searched the literature individually by identifying as many relevant studies as possible, and as a result, the quality of the studies reviewed can vary widely. The keywords used were inter-professional education, nursing, implications.

In this review, IPE is an interesting intervention and method for students, faculty members, and institution. Since the author works in the nursing education, the search term was limited into IPE in nursing; to look further what other disciplines can be involved in nursing. By examining the barriers encountered during IPE implementation and possible strategies used to overwhelm the threats, it was expected that there would be many educational institutions in developing country, especially in Indonesia, to practice IPE as one of their method of learning.

Based on the objectives of this review, the author selected only studies that evaluated an IPE program or its implementation. The inclusion criteria were the studies: (1) used the

English language, (2) publication status: scholarly journals, (3) publication period: less than three years (2012 to 2015), and (4) peer review and full text.

The primary research was selected in this review, using cross-sectional quantitative and/or qualitative and retrospective method of evaluation of IPE programs. The exclusion criteria were opinion articles, commentaries, editorials, reviews, and others that were not based on primary data. The author searched for similar studies with the search terms “inter-professional education,” “nursing,” and “implications.” There were three electronic databases included in this study, i.e., ProQuest, EBSCO and Cengage database which were designed to identify published a journal of IPE. After defined all variables, and limited search into English written, the author began to explore the journals.

From the search engine, the author retrieved a total 1,181 articles from ProQuest, 99 from EBSCO and 139 from Cengage. Thus a total of 1,419 articles were available during the preliminary screening. After applied the inclusion criteria, there were a total of 1,133 articles. A total 19 articles were available for in-depth screening and analyzed for this study. Multi-step literature search strategy is crucial to avoid bias and increase the accuracy of the review results. The eligible source may include research and theoretical papers.

Figure 1 shows the summary characteristics of the 19 selected articles on IPE programs or implementation. Because of the wide differences in study design, populations, settings, and presented results, it was impossible to conduct a meta-analysis. Furthermore, the outcomes of interest, barriers, and challenges, were mostly measured qualitatively. Therefore, meta-narrative was chosen to conduct data collection because it explained the various process from the secondary data.

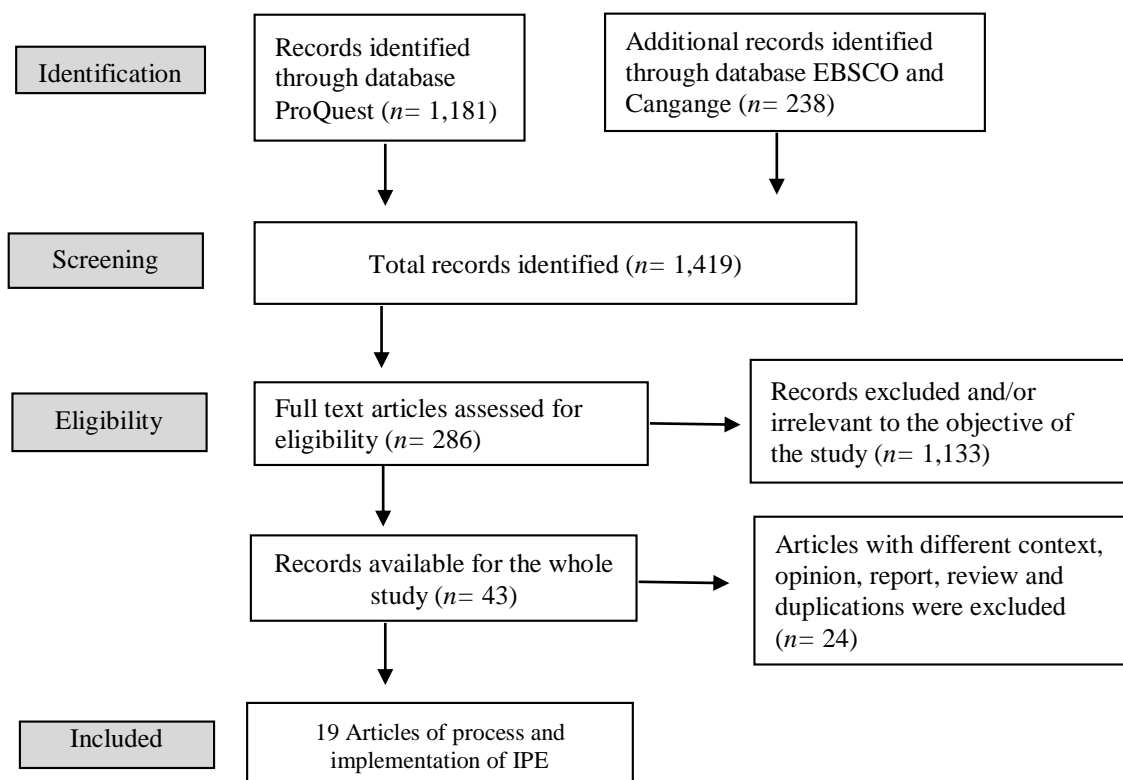


Figure 1. Diagram of information flow through phases of systematic review (The Prisma Group, 2009)

RESULTS

A total 19 articles were eligible for analysis out of 1,419 articles of study retrieved. Unfortunately, none of the studies reported findings from developing country, and only two studies were conducted in Asia, i.e., Hong Kong and Qatar. Most of the studies were conducted in the US (63%), indicating that a high number of IPE programs conducted there. Table 1 showed the overview of selected studies based and grouped into publication and place of IPE conduct, the program of IPE, method and result/implication of IPE.

Table 1. Overview of selected studies

Author & Origin	IPE Programs Reviewed	Methods	Results/Implication
Zanoti & Canova (2015) University of Padova, Italy	To evaluate the effectiveness of IPE in changing the attitudes of IP teamwork. Two activities involved: observation-based and practice-based learning. The training program was designed to have medical students tutored by nurses or other professionals in clinical activities & exposed to the skills of others.	Pre-posttest design using IEPS questionnaire. 421 medical students were required to attend 10 hours theory in class, 40 hours training of IP in a clinical setting	There was a significant improvement in students' perceptions of IP practice and in students' attitudes towards inter-professional which may lead to good collaboration with future doctors.
Wilbur & Kelly (2015) Nursing Program, University of Calgary & College of Pharmacy, Qatar University	To explore undergraduate pharmacy and nursing students' attitudes and perceptions of each other's role.	Qualitative method. Focus Group Interviews was applied for 10 pharmacy students and 9 nursing students.	Basic understanding of one another's roles was exhibited but tended to closely follow traditional scripts that are particularly pervasive in the Middle East. The quantity of current structured shared learning/patient care experiences was limited.
Gilligan, Outram & Jones (2014) New South Wales, Western Australia, and Tasmania-Australia	To explore the reflections of graduates on the IPE experiences they had during their undergraduate education and training	A qualitative method with the interpretive design. Using focus group, there were 26 nursing graduates, 17 medical graduates and 23 pharmacy graduates (total 63) who came from three Australian states	The following themes arose: experiences of IPE at University; missed opportunities on clinical placements; silos and social interaction; dissonance between stated faculty values and educational practice; and graduates' recommendations to improve IPE.

Author & Origin	IPE Programs Reviewed	Methods	Results/Implication
Burford, et al. (2013) Medical school in the UK	To explore what do newly qualified doctors learn how nurses in the workplace and the relationship between two professions (doctor and nurse). During the placement, doctors got exposure in the medical-surgical ward and worked with the nurse as teamwork.	participated in 12 focus groups. A qualitative method with multi-case study design. There were 46 final year of medical students to be interviewed as participants. Informants were interviewed 3 times during their placements: before, 4 months and 12 months after placement	Informal learning contributed to the knowledge of doctors' and other's role; nurses contributed to the explicit learning of skill and captured doctors' error with implications for patient safety. Doctors learned much about nurses' roles.
Joseph, et al. (2012) University of Arbedeen, UK	To ascertain attitude change experienced by health care students undertaking IPE activities in clinical practice. IPE activities using adult learning and a patient-centered approach. It was carried out in a theatre and primary care setting.	Pre-posttest design using RIPLS questionnaire. There were 38 respondents, such as medical, nursing, occupational therapy and pharmacy students who are attending IPE sessions in practice placement.	IPE activities implemented had positive effects on student's perceptions of IP working. The implications were that IPE does not require large classroom-based activities to be successful. It demonstrated that students could leave university better prepared for practice.
Lam, Chan & Yeung (2013). The Hong Kong Polytechnic University	To explore the inter-professional collaboration between nursing and social work professionals in their delivery of health service for school children.	A qualitative design using semi-structured interviews, field observation, and field debriefing. Seven nursing students and 5 social work students were recruited.	The collaboration can generate early identification and address the complex health needs of children. The development of IPE for school health services can reduce children's risk-taking behavior, promote their health and well-being.
Defenbaugh & Chikotas. (2015) Northeastern University, USA	To examine the impact of Standardized Patients Experiences in the education of Advanced Practice Nurse (APN). SPE has been found to improve the	A qualitative design with semi-structured, the open-ended question for an interview. There were 20 nurse practitioners and 9	Having an expert in the field of communication studies increased awareness of communication skills and improved nurse-patient encounter in the

Author & Origin	IPE Programs Reviewed	Methods	Results/Implication
	interpersonal, problem solving and critical thinking skills of nursing students.	nurse anesthetist students as the participants.	clinical settings. SPE provided a safe environment for the students to practice her/his clinical skills in a more realistic format.
Mast, Rahman, Shcatzman, Bridges & Horsley. (2015) Rosalind Franklin University of Medicine and science, USA	To assess the impact of inter-professional collaboration on practitioners who were charged with creating an IP care model emphasizing primary and secondary prevention service specific for seniors with diabetes. This study used PBL half-day workshop to immerse participants in experiential learning about IP using patient simulation, debriefing discussion & team-based activities.	Pre-posttest design using questionnaire of IEPS to assess attitudes and C-BAM to assess behavior related IP. Physician's assistance, physical therapy, pharmacy, nursing, registered dietician and podiatry (total 6 participants) participated in the intervention.	Recognizing the limitation of sample size, the result of the study indicates positive changes in attitude about IP collaboration, as well as moderate enhancement in behaviors. There are potential benefits of using a defined continuing professional education process, such as PBL to create an environment that fosters the IP collaboration that will improve patient outcomes/effective preventive care model.
Thuente. (2014). Two Midwestern United States University, USA	To examine the effectiveness of an inter-professional educational intervention of collaboration skills through low-fidelity simulation. The script guided students through the 7 steps of the collaboration process and facilitated teamwork.	Mix-methods pilot study, using pre-posttest questionnaire, observational and anecdotal data. There were 4 nursing students and 3 medical students who participated in the simulation.	Collaborative behaviors were demonstrated & appreciation was revealed of the overall experience. Low-fidelity simulation is a valuable and cost-effective method to teach IP educational skills, such as collaboration. These skills were essential to professional practice in the clinical settings.
Smith, K. A. (2014) University at Northeastern USA	To examine the effect of computer-supported IPE on students' attitudes and perceptions towards health care teamwork and team performance. A hybrid approach to IPE was used to provide students with an	A pre-posttest, one-group series research design. There were 63 students in medical, nursing, physical therapy, occupational therapy, couples and family therapy and	A statistically significant difference was found in students' perceptions of team performance after engaging in computer-supported IPE. No statistically significant difference in students' pre-posttest composite attitude toward

Author & Origin	IPE Programs Reviewed	Methods	Results/Implication
	educational experience that combined the benefits of traditional face-to-face communication methodology with a computer-mediated platform that focused on reflection and team building	pharmacy students. Students in this study participated in the online discussion.	teamwork score was noted; however, there was a positive trend toward improved scores.
Greidanus, King, LoVerso & Ansell. (2013) Canada	Proposes a systematic process for improving the relevance and validity of learning objectives (LOs) of IP SBT (Simulation-Based Training) using video review and follow-up student interviews.	The source of data: video recordings of simulation, debriefings of simulation and telephone interviews. The participants were recruited from practical nursing, medicine, BS nursing and respiratory therapy.	LOs should be revised to be more appropriate for pre-licensure health care system, where it was suggested to develop effective exposure level of IP simulation early in health education programs. LOs need to be linked with the competency and what was learned by the students.
Baker & Durham. (2013) University of North Carolina, USA	To examine students' collaborative competencies after participating in an inter-professional education course offered to undergraduates in nursing, medicine, and pharmacy.	Using a survey design, 33 students of the 1 st -3 rd year of medicine, nursing and pharmacy, who had completed the undergraduate IPE course, were e-mailed the tools.	The students' collaborative competencies in the core areas of communication, collaboration, roles and responsibilities, collaborative patient and family-centered approach, conflict management and resolution and team functioning significantly improved after course completion.
Hallas, Fernandez, Herman & Moursi. (2015). New York University, USA	Provide formal IP opportunities for the students to collaboratively examine the tenets of IP practice and the evidence-based, approaches to oral-systemic health care for children under 5 years old who are at high risk for dental caries. The students participated in	Nonexperimental descriptive study to observe and describe student interaction during IPE activities, involving 30 PNP (Pediatric Nurse Practitioners), 325 dental students and 18 residents.	The ICE program provided the dental and PNP students with a positive first experience in IPE and clinical practice; it provided unique opportunities for the students to manage both simple and complex oral health issues collaboratively. The new core

Author & Origin	IPE Programs Reviewed	Methods	Results/Implication
	6-weeks of ICE program (Initial Clinical Experience); clinical experience in oral health cares for at-risk children.		competencies for PNP and dental students need to focus on the acquisition of knowledge, skills, and attitudes to care for infants and toddlers.
Lancken & Levenhagen. (2014). USA	To describe a model promoting collaborative relationships among nursing and PT (physical therapy) students to improve patient and caregiver safety. Through this model, the PT students teach safe patient handling skill in a simulation setting to undergraduate nursing students; gain a better understanding of each other's professional roles.	A study developed to gather feedback from 351 junior-year nursing students about their experience of the student-led simulation and psychomotor mastery. The questionnaire used to measure students' satisfaction and qualitative data used to find the answer to open-ended questions due to the importance of IP collaboration and the significance of the curricular addition.	The majority of nursing students strongly agreed that they were confident in the skills taught by PT students and provided an overall course rating of outstanding or above average. The importance of the collaborative relationship and role identity was acknowledged in this study. The educational experience must shift from one in which health profession students were educated in silos to one that foster collaboration, communication and a team approach to providing care.
West, Courtney et al. (2015). Texas A&M University, USA	To examine the IPEC (Inter-professional Education Collaborative) competencies and analyze how specific IPE activities addressed the competencies. DD (Disaster Day) and IPHCE (Inter-professional Healthcare Ethics) were two IPE curricular elements offered at the institution. DD is disaster preparedness simulation exercise; the participants come from nursing, medicine, pharmacy, emergency	In DD: Health professions students interact with teams to deliver and manage scenario-based patient care situation. There were 20 items observations tools that observed during simulation. For PHCE, there was a checklist used to analyze the course syllabus and materials. The 42-item checklist consists of all the IPEC competencies	The observation and checklist instrument both appear to be acceptable tools for determining competency alignment. Both activities appeared to facilitate the development of IPE competencies; however, DD aligned more with IPEC competencies than the IPHE course and appeared to be a more comprehensive way of addressing IPE competencies. Moreover, offering one IPE activity was not sufficient. Having

Author & Origin	IPE Programs Reviewed	Methods	Results/Implication
	<p>medical technician physical therapy assistance, and radiology, as well as standardized patients and volunteers. IPHE was a collaborative course for nursing, medicine, and pharmacy; with activities of didactic sessions and small group case discussion.</p>	<p>and sub-competencies.</p>	<p>several IPE options available, utilizing the tools that have been developed to map IPE curriculum and evaluating competency coverage was recommended.</p>
<p>Johnson & Freeman. (2014) University in the southeast United States, USA</p>	<p>An attempt to integrate IPEC (Inter-professional Education and Collaboration Competencies) into Mental Health Sciences and Counseling (MHC). Researchers identify three phases in the IPE process: pre-phase (developing the course); active phase (conduct of the course itself); and Post-phase (assessing the efficacy of the course). The active phase including developing modules, discussion through board posts and experiential exercise.</p>	<p>A pragmatic tool to link theory and practice. There were 111 students of masters and doctoral students in clinical mental health counseling (15.3%), masters and doctoral students in nursing (36%), doctoral students in physical therapy (42%) and master students in dental hygiene (63%).</p>	<p>There were 4 competencies of IPEC that achieved during the study: values and ethics, roles and responsibilities, IP communication, teamwork and team-based care. From the reflection, there was a need for the MHC programs to investigate and made available practicum and internship opportunities that allow for IP clinical practice because it allowed the students to apply their IP training and skills to real-life situations.</p>
<p>Delunas & Rouse. (2014). USA</p>	<p>To examine attitudes about inter-professional communication and collaboration as well as the effect of an IPE intervention on health care students. The study followed a patient in a long-term care facility for three semesters; specific tasks were assigned according to discipline.</p>	<p>Quasi-experimental design with pre-post measures. There were 74 students participated in the study: first year medical students and junior nursing.</p>	<p>Medical and nursing students differed in their attitudes toward communication and collaboration at the beginning of the study, with medical students having significantly less positive attitudes. Across time, the attitudes of both medical and nursing students became even less positive; however, this decrease was only</p>

Author & Origin	IPE Programs Reviewed	Methods	Results/Implication
Acquavita, Lewis, Aparicio & Pecukonis. (2014) USA	To explore health and law university students' attitudes, knowledge, experience, and receptiveness regarding IPE and IPT (Inter-professional Training). Qualitative questions were asked regarding students' education and experiences working with other professionals, while the quantitative examined teamwork and collaboration, patient-centeredness and a sense of professional identity.	A mixed-method study using RIPLS questionnaire and semi-structured interviews. There were 29 students from 5 health sciences schools: Law, medicine, nursing, pharmacy and social work,	significant among medical students. Form quantitative data: There were no group differences by the school regarding readiness for IP learning. Qualitative interviews identified that students were exposed to two types of IP learning experiences: curricular IPE and clinical IPT. The majority of IP experiences occurred through an internship, student activities, community service opportunities, not in the classroom.
Pittenger. (2013) USA	To evaluate the feasibility and effectiveness of using an online social networking platform for IPE. Students in all groups interacted via an online social networking platform for a minimum of 15 weeks and met in person once at the end of the 15-week experience for a focus group session. The students were tasked with developing a collaborative recommendation for using social networking in IPE programs.	A mixed method design. For quantitative: Pre-posttest design using questionnaire of IEPS and RIPLS. There are 37 students participated and divided into several groups, which comprised 6 students with representing of health profession programs: medicine, nursing, dentistry, pharmacy, veterinary medicine and public health. For qualitative, using focus group session.	This pilot project demonstrated that using a social networking website Ning for IPE is feasible. Most students stated that interacting within a social networking space for 15 weeks with other members of university's health professions programs was a positive and effective IP experience. The use of learning technologies to create a meeting space which did not depend on time or place was a potential solution to the logistical barriers that have prevented wide-scale, longitudinal IPE.

Fifty-two percent of the reviews used quantitative approaches as the method of the study, following the qualitative and mixed methods. For quantitative, pre-posttest designs were applied in the selected studies using the questionnaire as the tools. All the selected studies explained or mentioned the activities and implementation that delivered through IPE.

There were 1 study published in 2012, 5 studies published in 2014, 7 and 6 studies published in 2014 and 2015. This phenomenon showed that the number of institutions applying IPE was increasing. It has been established that this approach promotes collaboration and enhances critical thinking, thus educates the students on their role and scope of practice.

Many of the IPE on selected studies contained a number of methodological weaknesses. For example, a number of studies only offered a limited sample, especially for the quantitative method; and less concern with sampling techniques in their work or study. As a result, it is difficult to understand the nature of their biases, which in turn undermines the quality of research.

DISCUSSION

The process of IPE implementation and its activities

It was found in the selected studies that IPE programs used a variety of combinations of interactive learning methods, with group problem solving, focus group interview and study case using simulated patient or simulated based training (SBT) being the most common methods employed (Thuente, 2014; Zanoti & Canova, 2015). Most programs drew, implicitly, upon the adult learning principles (Joseph et al., 2012).

In general, IPE programs employed formative assessment of learning, typically using assessment techniques in the form of individually written assignment and/or joint presentations. Few IPE programs included any form of formal academic accreditation. Further, most IPE programs were delivered as elective learning experiences to participants, where some of the school accepted the credit hours but some were not (Burford et al., 2013; Joseph et al., 2012; Zanoti & Canova, 2015).

From the selected studies, the activities implemented in IPE programs were varied. As suggested by West, et al. (2015) that the IPE activities should be varied from learning in a variety of IP settings is optimal. Most of the studies applied practiced based learning in the hospital, clinic, and community, or some mentioned it as initial clinical experiences. Another activity applied was simulation based practices or simulation experience, where the facilitator gave the case, and the students acted to solve the problem using collaboration technique with other students from different professions. Problem Based Learning (PBL), small group cased discussion was chosen as the activity on IPE, where this activity can be applied to stimulate the students to analyze and develop their critical thinking on the case given. Tutoring by other professionals and using social networking were also selected as the other activities in IPE (Zanoti & Canova, 2015). Using an online IPE discussion platform was thought to engage in group reflection (Baker & Durham, 2013; Smith, 2014). The use of learning technologies to create a meeting space which does not depend on time or place is a potential solution to the logistical barriers that have prevented wide-scale thus essential to an effective IPE

Other professionals involved with nursing

The synthesis revealed that IPE programs in the reviews were offered to a range of different combinations of professional groups, yet the medicine and nursing were the core

participants. Programs were more commonly delivered to students in the final year as a classroom or sometimes as a practice-based activity. Also, the synthesis of the reviews indicated that while the duration of IPE program varied, ranging from 1-to-2 days' sessions to programs delivered over a period of the year; most programs lasted between 1-3 months (Burford et al., 2013).

Most of the selected studies, nurse or nursing students performed a collaboration with medical students and pharmacy. Other professionals involved with nursing were occupational therapy, physical therapy, dietician, podiatry, dentist, veterinary medical, public health, social work, respiratory therapy, couples and family therapy and law students. Another interesting fact found in this review that there was one study which has master and doctorate students as participants (Johnson & Freeman, 2014).

Implication of implementing IPE

Across the studies contained in the reviews, most of the study reported the short-term impacts associated with IPE in relation to learner changes of attitude and knowledge. As a result, there was only a limited idea of the longer term impact of IPE, particularly on patient care, educational process or organizational change occurred during the delivery of a program (Mast et al., 2015; West et al., 2015).

Despite a number of weaknesses, there was fairly common use of quasi-experimental research designs (pre-posttest) and mix-method design, which provided some indication of change associated with the delivery of IPE; where the study gathered two forms of data (survey and interviews), and there was a growing use of longitudinal studies to begin to establish the longer-term impact of IPE on education process, patients care and organizations change (Mast et al., 2015; West et al., 2015).

Most reviews found that the outcome of their studies reported positive learner reactions, where most of the learners stated that the IPE brings value and new experience. The majority, the reviews reported positive changes in learner attitudes or perceptions in relation to the role and scope of practice, changes in views of IP collaboration, views of value attached to working in a collaborative basis with other professions. In addition, it was found that the positive changes in students' knowledge or skills of inter-professional collaboration usually related to an enhanced understanding of roles and responsibilities of other professional groups (Burford et al, 2013; Wilbur & Kelly, 2015), improved knowledge of the nature of IP collaboration (Thuente, 2014; Zanoti & Canova, 2015) and development of communications skills (Defenbaugh & Chikotas, 2015; Lancken & Levenhagen, 2014) .

In general, students and pre-licensure in the reviews reported outcomes in relation to changes in attitudes, knowledge, and perception and collaboration skills. Post-licensure IPE studies also reported a similar range of learner-orientated changes but also reported changes in patient care. Few studies reported outcomes related to individual behavior, usually reported as practitioners working more collaboratively with their colleagues from other professional groups, where they can perform the promoting and preventing aspect.

In addition, a few studies in the review reported the need for curricula or Learning Objectives (LOs) in the institution to be changed, where LOs or curricula should be revised to be more appropriate for students or pre-licensure health care system. The studies also suggested developing effective exposure level of IP simulation early in health education programs, where LOs or curricula need to be linked with the competencies (Greidanus et al., 2013).

The selected studies stressed the importance to bring the students as a collaborative team, both within the classroom and within a clinical setting. Acquavita & Pecukonis (2014) and others research suggested that most opportunities interact with other professional students occurred within the clinical or field setting and not in the classroom. The experiences occurred through an internship, students' activities, and community practice. Thus, it will require a unique type of curriculum and team of instructors. For example, the curriculum might teach students about group dynamics and communication skills using role plays (Greidanus et al., 2013; Thuente, 2014; West, 2015). Clinical placements could provide experiences in joint decision-making and negotiation skills by having a group of students work together to handle particular patients (Burford et al., 2013; Joseph et al., 2012).

CONCLUSION

Despite the limitations, this systematic review found some activities in IPE and other professionals that can be involved with nursing on IPE implementation in studies conducted in developed countries. This review also found out the implication of IPE for students, such as improving communication skills, recognizing the roles and responsibilities, understanding the value and ethics and increasing teamwork and team-based care. Nevertheless, this review identified that IPE applied in a variety of clinical settings is well received by students and can enable them to learn the knowledge and skills for collaborative learning. Based on the findings, future studies on IPE should clearly discuss the methodological limitation (sampling, detection bias), provide specific information about the educational process employed within an IPE program and provide both quantitative and qualitative data to describe the outcomes of the processes. However, challenges in this review suggest the importance to conduct a study for developing countries, so that for those who seek to plan and implement IPE program will be much more prepared.

REFERENCES

- Acquavita, S., Lewis, M.A., Aparicio, E., & Pecukonis, E. (2014). Student perspectives on inter-professional education and experiences. *Journal of Allied Health, 43*(2), e31-e36.
- Baker, M.J., & Durham, C.F. (2013). Inter-professional education: A survey of students' collaborative competency outcomes. *Journal of Nursing Education, 52*(12), 713-718. doi: 10.3928/01484834-20131118-04
- Burford, B., Morrow, G., Morrison, J., Baldauf, B., Spencer, J., Johnson, N., & Illing, J. (2013). Newly qualified doctors' perceptions of informal learning from nurses: implications for interprofessional education and practice. *Journal of Interprofessional Care, 27*(5), 394-400. doi: 10.3109/13561820.2013.783558

- Buring, S. M., Bhushan, A., Broeseker, A., Conway, S., Duncan-Hewitt, W., Hansen, L., & Westberg, S. (2009). Interprofessional education: definitions, student competencies, and guidelines for implementation. *American Journal Of Pharmaceutical Education*, 73(4), 59.
- Defenbaugh, N., & Chikotas, N. E. (2016). The outcome of interprofessional education: Integrating communication studies into a standardized patient experience for advanced practice nursing students. *Nurse Education in Practice*, 16(1), 176-181.
- Delunas, L.R. ,& Rouse, S. (2014). Nursing and medical student attitudes about communication and collaboration before and after an interprofessional education experience. *Nursing Education Perspectives*, 35(2), 100-105. doi: 10.5480//11-716.1
- Gilbert, J. H., Yan, J., & Hoffman, S. J. (2010). A WHO report: framework for action on interprofessional education and collaborative practice. *Journal of Allied Health*, 39(3), 196-197.
- Gilligan, C., Outram, S., & Levett-Jones, T. (2014). Recommendations from recent graduates in medicine, nursing, and pharmacy on improving interprofessional education in university programs: a qualitative study. *BMC Medical Education*, 14(1), 52.
- Greidanus, E., King, S., LoVerso, T., & Ansell, L.D. (2013). Inter-professional learning objectives for health team simulations. *Journal of Nursing Education*, 52(6), 311-316. doi: 10.3928/01484834-20130509-02.
- Hallas, D., Fernandez, J.B., Herman, N.G., & Moursi, A. (2015). Identification of pediatric oral health core competencies through inter-professional education and practice. *Nursing Research and Practice*, 2015, 1-7. doi: 10.1155/2015/360523.
- Johnson, K.F., & Freeman, K.L. (2014). Integrating inter-professional education and collaboration competencies (IPEC) into mental health counselor education. *Journal of Mental Health Counseling*, 36(4), 328-344.
- Joseph, S., Diack, L., Garton, F., & Haxton, J. (2012). Interprofessional education in practice. *The Clinical Teacher*, 9(1), 27-31. doi: 10.1111/j.1743-498X.2011.00486.x
- Lam, W., Chan, E. A., & Yeung, K. S. (2013). Implications for school nursing through interprofessional education and practice. *Journal of Clinical Nursing*, 22(13-14), 1988-2001. doi: 10.1111/jocn.12163
- Lancken, S.V.D., & Levenhagen, K. (2014). Interprofessional teaching project with nursing and physical therapy students to promote caregiver and patient safety. *Journal of Nursing Education*, 53(12), 704-709. doi: 10.3928/01484834-20141118-14
- Mast, L.J., Rahman, A., Shcztzman, B.I., Bridges, D., & Horsley, N. (2015). Innovations in continuing professional education: A model to impact inter-professional collaboration. *Int Public Health J*, 7(1), 65-77.
- Pittenger, A.L. (2013). The use of social networking to improve the quality of inter-professional education. *American Journal of Pharmaceutical Education*, 77(8), 1-9.
- Smith, K.A. (2014). Health care interprofessional education: Encouraging technology, teamwork, and team performance. *The Journal of Continuing Education in Nursing*, 45(4), 181-187. doi: 10.3928/00220124-20140327-01

- Sunguya, B. F., Hinthong, W., Jimba, M., & Yasuoka, J. (2014). Inter-professional education for whom? - Challenges and lessons learned from its implementation in developed countries and their application to developing countries: A systematic review. *PloS one*, 9(5), e96724.
- Thuente, L.F. (2014). A Contemporary method to teach collaboration students. *Journal of Nursing Education*, 53(11), 641-645. doi: 10.3928/01484834-20141027-02
- West, C., et al. (2015). Tools to investigate how interprofessional education activities link to competencies. *Med Educ Online*, 20(28627). Retrieved from: <http://dx.doi.org/10.3402/meo.v20.28627>
- Wilbur, K., & Kelly, I. (2015). Interprofessional impressions among nursing and pharmacy students: a qualitative study to inform interprofessional education initiatives. *BMC Medical Education*, 15(1), 53. doi:10.1186/s12909-015-0337-y
- Zanotti, R., Sartor, G., & Canova, C. (2015). Effectiveness of interprofessional education by on-field training for medical students, with a pre-post design. *BMC Medical Education*, 15(1), 121. doi: 10.1186/s12909-015-0