



Current status of interprofessional education learning activities in wards provided by tertiary hospitals and secondary general hospitals and barriers

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(Received May 6, 2022 · Revised June 9, 2022 · Accepted June 18, 2022)

ABSTRACT

Background: The World Health Organization (WHO) has focused on the need for interprofessional education (IPE) to improve interprofessional collaboration competency and patient health outcomes. Accordingly, most European and North American medical colleges have established IPE for students. However, IPE learning activity in medical wards for the clinical experience of pharmacy students has not been fully reviewed in Korea. Therefore, this study aims to examine the current status of IPE learning activities in wards at tertiary and secondary hospitals in order to identify ways to improve the program. **Methods:** The official document of cooperation consists of six self-administered questions regarding IPE learning activities in wards. The preceptor's response in each hospital was evaluated. **Results:** Of the 22 hospitals, 9 tertiary hospitals and 12 secondary general hospitals responded. For the introductory pharmacy practice experience (IPPE), participating in intensive care (IC) was provided at one secondary general hospital (8.3%) and no tertiary hospital. Ward rounds with medical staff members were provided at two tertiary hospitals (22.2%) and one (8.3%) secondary general hospital. A major barrier to executing IPE was lack of rewards and incentives for the faculty and preceptors who participated in the program. **Conclusion:** In both tertiary hospitals and secondary general hospitals, pharmacy students have limited exposure to IPE learning activities in wards at hospital, and IPPE at most hospitals was carried out in pharmacy settings only. This study suggests that it is necessary for the hospitals to improve and support IPE learning activities in wards in order to improve learners' competency.

KEYWORDS: Interprofessional education, learning activities, ward round, collaboration, competency

Medical professional education in North America began to take a more systematic approach toward the development of competency-based interprofessional education (IPE). This was done to improve interprofessional collaboration competency while recognizing the limitations of academic achievement in traditional education that was centered on knowledge and attitude.¹⁾ In 1988, the World Health Organization (WHO) emphasized the importance of interprofessional education to improve student learning outcomes and focused on the need for interprofessional collaborative care to increase patient health outcomes.²⁻³⁾ Since then, the two types of educations have developed simultaneously.²⁻³⁾ Competency-based IPE is an education that integrates knowledge, skills, values, and attitudes that are job competencies for specific medical

professions.⁴⁾ It is a teaching method in which medical profession students work and learn together to improve collaborative care and treatment quality.⁵⁾

Collaborative care, as defined by the World Health Organization (WHO 2010),⁶⁾ the Canadian Interprofessional Health Collaborative (CIHC, 2010),⁷⁾ and the Interprofessional Education Collaborative (IPEC),⁴⁾ is that medical professional students collaborate with patients, their families, and community through IPE to solve problems such as patient safety, chronic disease management, and primary health care, as well as to provide the best healthcare.^{6,8,9)}

Interestingly, IPE has been shown to be valuable in allowing students to learn innovative concepts and experience special patient care. As established in the several studies from Sweden,

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the UK, and Finland, this experiential learning allows students to actively participate in it and provide clinical experience.⁸⁾ It has been shown to improve their knowledge, skills, and attitudes toward team collaboration, enhances learners' understanding of the values and roles of other professions, and improves the quality of patient care.¹⁰⁻¹¹⁾

Several studies describe that IPE is structured as an adult learning method, such as single professional education, and the characteristics of adult learning are diverse and include such learnings as active or passive, self-directed or teacher-led, and situational or classroom.^{2,8,11)} self-directed learning is developed through tasks and problems, empirical techniques, and independent research learning activities. By contrast, professor-directed (or teacher-led) learning is dependent on the instructor and comprises delivery techniques and task assignment learning activities.¹²⁻¹³⁾ The most common activities accessible in this method include case-based learning,¹³⁾ experiential, decision-making, and problem-based learning that allows students to train with other professions as a team in a practice room designed to foster interprofessional interactions¹⁴⁻¹⁶⁾; simulation-based and practice-oriented learnings, in which students collaborate with various occupational groups to create interprofessional learning opportunities¹⁷⁾; and e-enhanced learning using new educational technologies, such as virtual environments or online conversation tools.¹⁸⁻¹⁹⁾ Another task-based interprofessional education has introduced positive-based and cooperative inquiries²⁰⁾ to improve medical services.²¹⁾

The effect of IPE on learning outcomes may depend on strategically constructing learning methods or activities, as the diversity of learning methods or activities above have shown. However, IPE cannot be implemented by educational institutions alone,²⁾ but also requires mutual education including active participation of learners and teachers, learning environments, and support from medical institutions. A more vital, in our view, is to establish an educational system that completely supports learning activities in both educational institutions and medical institutions to improve student learning outcomes. A more need in the uniprofessional learning environment of most colleges of pharmacy is well-designed collaborative learning experiences or experiences in clinical settings to achieve learning outcomes. However, a detailed review of clinical experiences in clinical settings offered by medical institutions is lacking.

Until now, WHO and educational institutions in North America and Europe have recommended and improved IPE to

enhance the quality of patient care and health outcomes in an environment with rapid social changes due to an aging population, financial restrictions, and the healthcare system. Domestic six-year pharmacy colleges have recognized the need for a competency-based IPE to improve core competencies not only of graduates but also areas and began to recommend university-led competency-based IPE. Accordingly, an accreditation evaluation of the pharmacy college curriculum was implemented across 30 colleges from 2015²²⁾ to 2021.²³⁻²⁵⁾ In particular, the accreditation evaluation items for the practical experience curriculum were designed to allow pharmacy students to demonstrate their professional competencies by collaborating with a medical professional team after graduation. The evaluation item is as follows: "Medical institutions provide practical content that allows students to interact with various adjacent occupational groups as a member of a medical team." This evaluation item assesses if students are provided the opportunity to experience IPE learning activities in medical wards.²⁶⁾

However, it remains unclear whether most colleges of pharmacy have an educational system that evaluate student learning outcomes in connection with IPE learning activities in wards. Similarly, In-depth examination of IPE learning activities in wards provided by multiple hospitals in the introductory pharmacy practice experience (IPPE) and the advanced pharmacy practice experience (APPE) curriculum is limited. Therefore, it is necessary to review IPE learning activities in wards offered at each hospital based on accreditation evaluation standard of the pharmacy college curriculum requiring IPE learning activities in wards. The aim of this study was to examine the status of IPE learning activities in wards provided by tertiary hospitals and secondary general hospitals, and the related gaps between two types of hospitals and barriers in order to identify ways to improve the program and to encourage the implementation of the program in both tertiary and secondary general hospitals in the IPPE and the APPE curriculum.

Materials and Methods

Study design

This study was designed as an official document for cooperation with an easy to response survey to review the implementation of IPE in wards and related barriers in medical institutions. This survey was completed only by the

Table 1. Baseline characteristics of the hospitals located in Seoul and Gyeonggi-do

Types of practice experience	IPPE, n (%) ^a		APPE, n (%) ^a	
	Tertiary hospital	Secondary general hospitals	Tertiary hospital	Secondary general hospitals
Types of hospitals				
Location				
Seoul	9(42.9)	8(38.1)	7(50.0)	5(35.7)
Gyeonggi-do	0	4(19.0)	0	2(14.3)

^aData are expressed by number and percentage.

IPPE, Introductory Pharmacy Practice Experience; APPE, Advanced Pharmacy Practice Experience.

preceptor in charge who was delegated by each hospital. Accordingly, six IPE learning activities related to ward practice and rounds education (Table 1) were employed: participation in medication guidance practice for inpatients; participation in an intensive care unit (ICU), dialysis rooms (DR), and emergency rooms (ER) rounds with a pharmacist; participation in clinical practice with physicians; participation in ward rounds with medical staff members; providing new drug information to new nurses regularly; and participation in medical professional conferences and seminars conducted by a hospital. In case ward practice and rounds could not be provided, a written explanation could be provided as to the reason for not providing ward practice. The learning activity items in this study were created by referring to the WHO and IPE guide, and the related responses were recorded as yes or no.

Study participants and data collection

Nine tertiary hospitals and twelve secondary general hospitals with introductory pharmacy practice experience (IPPE) (located in Seoul and Gyeonggi-do), and seven tertiary hospitals and seven secondary general hospitals, each with advanced pharmacy practical experience (APPE), were selected as educational institutions entrusted of Duksung Women's University from December 2019 to October 2020. One preceptor who is in charge of practice delegated at each hospital was selected as a respondent to an official document survey. A total of twenty-one preceptors in charge of practical education were selected from twenty-one hospitals to accurately describe the status of IPE learning activities offered only by each hospital. A research assistant sent an official document for cooperation to the selected twenty-one preceptors and asked to complete the official document survey electronically. we reviewed literatures and designed six IPE learning activities in wards in IPPE and APPE curriculum that requires practice in hospitals as a

survey questionnaire. The preceptors sent the official document for cooperation electronically back to the research assistant after completion of survey questionnaires. To establish the reliability of the survey responses from cases where there may be biased opinions of the preceptors, we asked each preceptor in charge to check the only IPE learning activities in wards offered by the affiliated hospital through the official document including the definition of IPE learning activities and types of them, and if the activities are not offered, it was also requested to let us know the reasons or alternative activities provided by the hospital through official documents. However, if the preceptor prefers a call to inform the reasons for personal reasons, these were also selected as data.

The official document for survey comprised six IPE learning activities in the wards for each hospital. Data on the status of IPE learning activities in ward practice and rounds provided by the hospital among the IPPE and APPE curricula were collected. However, personal identification information was not included in the survey in the official document; the response results were thus confidential. This study was approved by the Institutional Review Boards (IRB: No. 2022-005-023-B) of Duksung Women's University with a nonhuman designation and the study was conducted in accordance with the Declaration of Helsinki.

The request for the official document for cooperation and evaluation methods

The official document for cooperation was requested by following the steps outlined below. First, the document was sent to the educational institutions mentioned above, from January 2021 to April 2021. Second, the research director, through the said document, explained the purpose of sending the official letter to the preceptor in charge of each hospital, clarifying that the learning activities ward practice and rounds at the hospital are an excellent accreditation evaluation factor

for colleges with pharmacy practice experience curriculum. Third, the preceptor was asked to respond about whether or not IPE was implemented in the hospital in the text box of the official document. Fourth, the preceptors were assured that if providing interprofessional education was a challenge, the reasons or alternative learning methods could be elucidated either through the written response or the phone call response to the open-ended question. Finally, data on the current learning activities were divided into tertiary hospitals and secondary general hospitals, as well as the IPPE and APPE, and evaluated.

Data analysis

The obtained data were analyzed using descriptive statistics to review the gaps of IPE learning activities in wards between IPE accreditation evaluation standard and hospital trainings. IPE learning activities in wards were assessed using the activities were created by referring to the WHO and IPE activities. Data regarding these activities were presented as percent of each item. The written responses or phone call responses as to the reasons for not providing IPE learning activities in wards in hospitals were analyzed as barriers and alternative learning methods according to the contents of the responses. The data for barriers and alternative learning methods were classified into categories and quantitatively analyzed. Data regarding these responses were presented as percent of each item.

Results

Response of the hospitals and preceptors

As presented in Table 1, data were collected from 21 educational institutions that responded among 22 hospitals located in Seoul and Gyeonggi-do, involved in practice training students of Duksung Women's University. All nine tertiary hospitals and twelve secondary general hospitals agreed to proceed with the official document for cooperation in IPPE curriculum and all seven tertiary hospitals and seven secondary general hospitals agreed to proceed with the official document for cooperation in APPE curriculum.

Identifying the IPE learning activities in the wards with IPPE

As depicted in Table 2, the frequency of providing medication administration guidance to in-patients in the IPPE

was 16 (76.2%). Additionally, participation in the ICU, DR, and ER rounds with a pharmacist was provided only at one hospital (4.8%) and was the least frequent activity area among all IPE learning activities. Furthermore, the tertiary hospitals never provided such learning activity. Three (14.3%) hospitals provided opportunity to participate in clinical practice with physicians, an educational activity that was never provided by secondary general hospitals in Fig. 1. Three hospitals (14.3%) participated in ward rounds with medical staff members, four (19.0%) provided new drug information training to new nurses regularly, and sixteen (76.2%) provided students the opportunity to participate in medical professional conferences and seminars. Both tertiary and secondary general hospitals displayed a high frequency of providing education for participating in medical professional conferences and seminars.

Identifying the IPE learning activities in wards with APPE

As displayed in Table 3, 10 hospitals (71.4%) provided medication administration guidance for in-patients within the APPE. Additionally, participation in ICU, DR, and ER rounds with a pharmacist was provided at eight hospitals (57.1%), indicating of a higher experience of providing IPE learning activities in tertiary hospitals than in secondary general hospitals in Fig 2. Six hospitals (42.9%) provided students the opportunity to participate in clinical practice with physicians, five (35.7%) allowed them to participate in ward rounds with medical staff members, and four (28.6%) provided new drug information training to new nurses regularly, which revealed that it was the least frequent activity area among IPE learning activities. Twelve hospitals (85.7%) participated in professional medical professional conferences and seminars conducted by a hospital.

Reasons for barriers and alternative learning methods to the IPE learning activities in wards

In the six areas examined in IPPE and APPE, the following were identified as barriers that make it challenging to conduct ward practice and ward rounds: two (9.5%) for limited student participation; four (19.0%) for lack of rewards and incentives for the faculty and preceptors who participated in the program; two (9.5%) for difficulties in developing student guidance and learning activities due to shortage of pharmacists; three (14.3%) for lack of space in hospital pharmacy to accommodate students; and two (9.5%) for limitations in practice due to the COVID-19 virus infection. Other reasons for alternative

Table 2. Status of IPE learning activities in IPPE provided by hospitals located in Seoul and Gyeonggi-do

Hospitals (n=21)	IPE learning activities in IPPE, n (%) ^a						
	participate in medication guidance for inpatients	Participate in the ICU, DR, and ER rounds with pharmacists	Participate in clinics round with physician	Participate in ward round with medical staff members	Providing drug information to new nurses on a regular basis	Participate in conferences and seminars provided by hospitals	
	16 (76.2)	1 (4.8)	3 (14.3)	3 (14.3)	4 (19.0)	16 (76.2)	
Tertiary Hospitals (n=9)	1	○	-	○	-	○	○
	2	○	-	-	-	-	○
	3	-	-	-	-	-	○
	4	○	-	○	○	-	○
	5	○	-	-	-	-	○
	6	○	-	○	○	-	-
	7	○	-	-	-	-	○
	8	-	-	-	-	-	-
	Secondary General Hospital (n=12)	9	○	-	-	-	-
10		○	-	-	-	○	○
11		-	-	-	-	-	-
12		○	○	-	-	○	○
13		○	-	-	-	-	○
14		○	-	-	-	-	○
15		○	-	-	-	-	○
16		○	-	-	-	○	○
17		-	-	-	-	-	○
18		○	-	-	○	-	○
19		○	-	-	-	-	○
20		-	-	-	-	-	-
21	○	-	-	-	-	○	

^aData are expressed by number and percentage.

IPE, Interprofessional education; APPE, Advanced Pharmacy Practice Experience; ICU, Intensive care unit; DR, Dialysis room; ER, Emergency room.

○, learning activities are implemented; -, learning activities are not implemented.

learning activities include: four (19.0%) for outpatient pharmacy drug administration; three (14.3%) for simulation or role-play learning activities within the pharmacy; and two (9.5%) for SOAP note learning activities for patient cases. As above, IPE Learning activities in wards were replaced with other activities in the pharmacy setting only.

Discussion

This study examined the status of university-led competency-based IPE learning activities in wards offered at nine tertiary

hospitals and twelve secondary general hospitals based on IPE accreditation evaluation criteria. The data collected from the twenty-one hospitals highlights that the percentage of IPE learning activities in wards provided to pharmacy students was very low. Additionally, the percentage of implementing IPE learning activities in wards with medical staff members was between 8.3-28.6% in the secondary general hospitals, and 22.2-28.6% in tertiary hospitals as shown in Figs. 1 and 2. In other words, more tertiary hospitals provided IPE learning activities than secondary general hospitals. Though the opportunity to experience of IPE learning activities provided

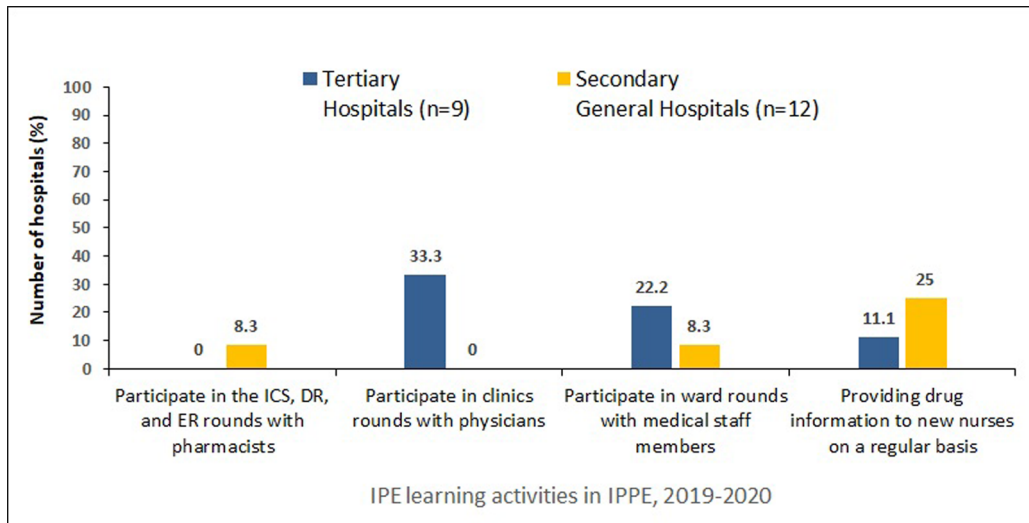


Fig. 1. Comparison of interprofessional education learning activities in tertiary hospitals and secondary general hospitals in IPPE. The opportunity to experience of IPE learning activities was a little higher in tertiary hospitals than in secondary general hospitals. However, it shows that the opportunity to experience of IPE learning activities in medical wards are very low in all hospitals in IPPE.

Table 3. Status of IPE learning activities in APPE provided by hospitals located in Seoul and Gyeonggi-do

		IPE learning activities in APPE, n (%) ^a					
Hospitals (n=14)		participate in medication guidance for inpatients	Participate in the ICU, DR, and ER rounds with pharmacists	Participate in clinics practice with physician	Participate in ward round with medical staff members	Providing drug information to new nurses on a regular basis	Participate in conferences and seminars provided by hospitals
		10(71.4%)	8(57.1%)	6(42.9%)	5(35.7%)	4(28.6%)	13(92.9%)
Tertiary Hospitals (n=7)	1	-	○	-	-	○-	○-
	2	-	○	-	-	-	○
	3	-	○	-	-	-	○
	4	○	○	○	○	-	○
Secondary General Hospital (n=7)	5	○	○	○	○	-	-
	6	○	-	-	-	-	○
	7	-	○	○	○	-	○
	8	○	-	-	-	○	○
	9	○	○	-	-	○	○
	10	○	-	○	-	-	○
	11	○	○	○	○	-	○
	12	○	-	-	-	-	○
	13	○	-	○	○	○	-
	14	○	-	-	-	-	○

^aData are expressed by number and percentage.

IPE, Interprofessional education; APPE, Advanced Pharmacy Practice Experience; ICU, Intensive care unit; DR, Dialysis room; ER, Emergency room.

○, learning activities are implemented; -, learning activities are not implemented.

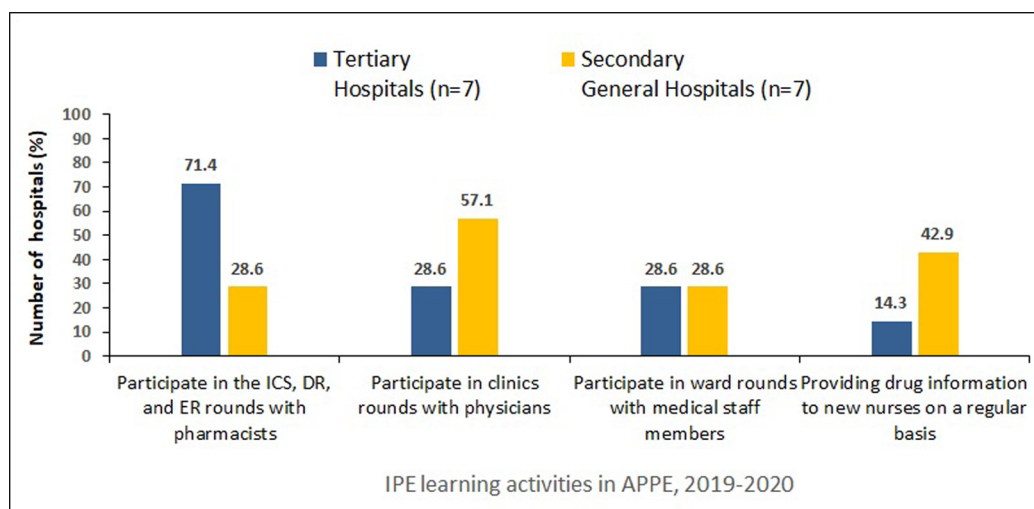


Fig. 2. Comparison of interprofessional education learning activities in tertiary hospitals and secondary general hospitals in APPE. The opportunity to experience of IPE learning activities in APPE is higher than that in IPPE in all hospitals. However, it still shows that the opportunity to experience of IPE learning activities in medical wards are low in all hospitals in APPE.

by both hospital types was very low, that within the APPE provided by both tertiary and secondary general hospitals was slightly higher than that in IPPE. This suggests that pharmacy students have limited opportunities to experience IPE learning activities in medical wards within the IPPE at both tertiary and secondary general hospitals.

Regarding the status of IPE education at US universities, 16 US medical schools, in 2009, implemented IPE learning activities, including cooperative learning activities with nurses, pharmacists, and doctors (93%), IPE learning activities (87.5%), and team-based learning activities (36%).²⁷⁾ Learning methods included simulation and role-play (71%), exchange-based learning and case discussions (50%), treatment-based learning and task-based activities (<30%), as well as observation-based learning (<30%) and passive professor-led learning (14%). In 2011, among 116 US pharmacy schools, 50 (55%) had IPE courses in university-led IPPE, and 41 (45%) did not have a continuing curriculum.²⁸⁾

Furthermore, as there are more than six medical professional education courses in a school, the number of implemented IPE within the IPPE is high.²⁸⁾ As mentioned above, the percentage of implementing IPE learning activities in US pharmacy schools was inferior to that of the medical schools. Additionally, the number hospitals in Korea implementing IPE learning activities were less than that of US pharmacy schools, indicating that IPE learning activities with nurses, pharmacists, and doctors in medical wards require the educational strategy and improvement

to promote competency-based IPE in domestic hospitals. One of the educational strategies suggested in this study is the need to increase the faculty development and offer an opportunity for faculty to develop IPE learning activities.

Competency-based IPE focuses on improving collaboration and learning between medical professionals and students, to better the quality of patient care.^{6,29)} This is because IPE is essential for developing medical professionals who are ready for collaborative care⁶⁾ and because it can provide values that are difficult to achieve through a single professional learning activity. In the presentation of the WHO Framework Study Group,⁶⁾ regarding the impact of IPE on medical achievement and delivery of medical services, the research by McAlister FA (2004) and Holland²⁸⁾ revealed that collaborative care is effective in reducing the risk of death and hospitalization among patients with heart disease.³⁰⁻³¹⁾ Additionally, the most common learning outcomes of IPE are knowledge and skills for collaboration, roles and responsibility, communication, patient-centered care, and ethics and attitudes.³²⁾ This outcome can be considered a learning goal³³⁾ or a competency.⁴⁾

Considering the effect of IPE on learning outcomes, medical education institutions in North America and Europe are striving to approach the goals of IPE through various learning activities and methods. However, few studies have directly identified the effect of IPE on learning outcomes. Cooper *et al.*³⁴⁾ and Barr²⁾ found that IPE had the greatest effect on the response to learning, but since most of the studies included in

Barr's research focused on the satisfaction or response of learners for a short term, it is not clear whether it is possible to evaluate the true effect of IPE on learner's outcomes. Similarly, Reeves^{35,36)} evaluated the effect of IPE through nine randomized studies conducted in Austria, Belgium, Sweden, the United Kingdom, and the United States, however, in all nine studies, the research methods were heterogeneous with each other, indicating a lack of evidence in deriving the effect of IPE on the quality of patient care and cooperative work attitude.^{35,37,38)} The effect of IPE on learning outcomes may vary depending on the participating academic institution or medical institution, but to evaluate the effectiveness of IPE on learning outcomes, it is necessary to identify the direct relationship between IPE and patient health outcomes. Therefore, it is important for medical institutions to engage in IPE with academic institutions and to participate in mutual education according to accreditation evaluation standard requiring IPE learning activities.

The findings of this study show the current status of IPE learning activities provided by hospitals. The target hospitals for this study were tertiary and secondary general hospitals who collaborated with the Duksung Women's University in Seoul and the Gyeonggi-do region. This may not completely reflect the IPE status of other hospitals located in Chung cheong-do, Gyeongsang-do, and Jeolla-do, and those located in Seoul and Gyeonggi-do but not collaborating with Duksung Women's University. Therefore, it may be difficult to generalize the results of this study to reflect the current status of IPE learning activities in medical institutions nationwide.

Six pharmacy schools in the US (including the Western University of Health Sciences, University of Minnesota, and The University of Texas, among others) found the following as barriers to IPE learning activities: curriculum management, resource limitations, relevant cultural issues,³⁷⁾ difficulties in designing common courses and activity schedules for different degree programs, resources needed to develop professional education approaches, content ownership disputes, and lack of promotion and compensation for preceptors participating in IPE, lack of medical institutions, and the necessity of identifying the differences from primary groups to evaluate student performance and curriculum changes. In domestic hospitals, these barriers include the lack of IPE learning activity programs and support, lack of medical institutions and human resources providing IPE,²⁸⁾ insufficient space in hospital pharmacies to accommodate students,³⁷⁾ restrictions placed on

participating in ward-training, and lack of promotion and compensation for preceptors participating in IPE.^{37,35)} The above study indicates that not only domestic colleges of pharmacy but also American colleges of pharmacy are facing several barriers in accessing IPE in wards.

Therefore, to facilitate access to IPE, we propose the following improvements. First, institutional support to provide promotion and compensation to faculty and preceptors participating in IPE is needed.^{28,34,37)} Second, institutional support is pertinent to continuously maintain and manage access to IPE. Third, mutual discussions between instructors, preceptors, and students to identify basic requirements from the initial stage of IPE design and implementation is needed.³⁴⁾ Finally, Korean Accreditation Council for Pharmacy Education (KACPE) must take the lead in the evaluation and management of all medical institutions and pharmacy schools to continuously mutual support and successfully promote changes in the design, development, content, and method of IPE in wards for improving student learning outcomes.

Conclusions

The opportunities of IPE learning activities in wards were insufficient for pharmacy students to experience patient-centered clinical practice provided by both tertiary and secondary general hospitals in Korea. Therefore, hospitals need to improve and support IPE learning activities in wards to improve learners' interprofessional collaboration competency in cooperation with colleges of pharmacy before the students graduate. This study also suggests that it is necessary for the hospitals to reward and promote faculty, preceptors, doctors, and nurses who participate in IPE learning activities. Further research is required to evaluate IPE learning outcomes.

Acknowledgment

I would like to thank the 21 preceptors of the medical institutions which collaborated with Duksung Women's University, who responded to the official document for cooperation.

Conflict of interest

The author has no institutional interest or conflicts.

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