



Model of Interprofessional Education Disaster Management using Virtual Learning in Indonesia

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Abstract

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BACKGROUND: One of the most pressing challenges is the need to strengthen health systems based on primary health-care principles. Innovation and system transformation are needed to ensure the proper provision and distribution of health personnel, one of the most promising of which is interprofessional collaboration.

AIM: The aim of this research is to produce a disaster management interprofessional education (IPE) development model.

METHODS: Design of this research is one group pre- and post-test. The study used a questionnaire to measure the collaborative abilities of students before and after the implementation of IPE using the IPE model compiled by researchers. The population were Nursing Diploma students of Polytechnic of Ministry of Health Manado 3rd year, amounting to 380 people with sample counting using the Slovin formula so as to obtain a total sample of 79 people.

RESULTS: The results showed an increase in the average value of the post-test increased by 130.78 from the average value of the pre-test which was 83.04. Wilcoxon statistical test results showed $p = 0.000$ (<0.005), which means an increase in collaboration skills after respondents were given disaster management IPE learning through virtual learning.

CONCLUSIONS: The IPE model was developed effectively in improving the collaboration skills of students in disaster management.

Introduction

One of the most pressing challenges is the need to strengthen health systems based on primary health-care principles. Innovation and system transformation are needed to ensure the proper provision and distribution of health personnel, one of the most promising of which is interprofessional collaboration (IPC) [1], [2]. Effective collaboration and communication are very much needed to minimize the risk of errors and improve the quality of care [3], [4]. According to Lestari, interpersonal collaboration with other professions can be achieved if, during education, students gain experience in establishing relationships with other professions [5], and this collaborative practice needs to be introduced to students from an early age [6], [7].

The application of IPE in the learning process will result in collaborative practice in handling patients [8]. The World Health Organization presented the results of research in 42 countries on the impact of collaborative practice in the world of health. This

study shows that collaborative practice can improve the affordability and coordination of health services, use of specific clinical resources as appropriate, health outcomes for chronic diseases, and patient care and safety. In addition, collaborative practice can reduce the total complications experienced by patients, length of hospitalization, tensions and conflicts among caregivers, hospital costs, average clinical error, and average number of patient deaths [1], [9].

Many universities in the world have implemented interprofessional education (IPE), and some countries have even established bodies or centers for the development of interprofessional practice and education, namely, the Australian Inter Professional Practice and Educational Network, Canadian Interprofessional Health Collaboration, European IPE Network), Journal of Interprofessional Care, National Health Sciences Students' Association in Canada, The Network: Toward Unity for Health, Nordic Interprofessional Network, and the UK Center for the Advancement of IPE [1].

In Indonesia, there are several institutions that have held IPEs in the learning process, among others with the topic "The first 1000 days of life," "Integrated Ante-Natal Care," "Community and Family Health-care Program" [10], "Cultural Competency Program for Rural Areas," and "Family Medicine-Home Visit" [11]. Judging from the IPE topics above, there is no IPE topic in a disaster emergency, even though Indonesia is located on the route of earthquakes and volcanoes, making it a disaster-prone country [12].

A well-planned emergency response in conditions of emergency, disaster, and conflict is required. However, a study from Indonesia reveals that the preparedness knowledge of to cope with disasters is still low in Indonesia, especially for nurses [13]. To address gaps in water, food, and medical supplies, health workers must have the knowledge and skills to mobilize whatever resources and expertise are available within the health system and society at large. The skills necessary to coordinate service delivery when an emergency situation arises can be acquired through IPE [14]. The application of collaborative practices in disaster management is important to provide optimal treatment for patients and result in better patient recovery [15]. Kusumawati suggested the need for health institutions to develop IPE in the curriculum, including the IPE module for disaster management [16].

The challenge faced in implementing IPC in health services is the difference in perspectives between professions in carrying out their respective duties and in viewing other professions. This can happen because an understanding of IPC is not obtained during education. When they study in college that they only learn about tasks according to their respective professions, they are not taught how to deal with patient problems by involving all professions [17].

This study aims to produce a model of IPE in the Polytechnic of the Ministry of Health Manado associated with the use of Virtual Learning Poltekkes Ministry of Health, Manado, especially in disaster emergency response in the community.

Methods

The research method used is quantitative research with a one group pre- and post-test approach. The study was conducted in August–October 2019 at the Health Ministry of Health, Manado. The population in this study was the 3rd year Poltekkes Ministry of Health Manado with a total population of 380 people. Furthermore, it is calculated using the Slovin formula to obtain a total sample number (n) of 79 people using a proportionate stratified random sampling technique.

The independent variable in this study was the IPE Virtual Learning model in the Disaster

Management Collaboration. The dependent variable is the collaboration ability of students before and after the implementation of IPE using a model developed by the researchers. The IPE model that we have developed consists of four stages, including planning, implementing, evaluating, and impacting. The planning process goes through several stages, namely, identification of objects (facilitators and students), IPE module design, material development, and learning design in the virtual learning application at the Health Polytechnic of the Ministry of Health, Manado.

The next stage is implementation which follows the curriculum applicable in tertiary institutions, where each subject holds 16 meetings, both for theory and practicum. IPE for Disaster Management is given a burden of two credits, namely, theory = one credit and practicum = one credit. One theoretical lecture takes 50 min and one practicum lecture takes 170 min. The implementation is divided into several parts, namely, pre-test, e-learning learning process (using the Vilep Poltekkes Manado application, with self-learning methods through video and modules, live chat with facilitators, video conferencing with facilitators, and carrying out module assignments), classical learning process, mid-semester examination, finals examination, and post-test.

The third stage is the evaluation stage. In this stage, it is necessary to evaluate the model that has been developed to assess whether the implementation of IPE is running according to the model developed and the evaluation also functions to identify and find solutions to any problems that often arise during the implementation of learning. The final stage is to observe the impact of IPE, which can be determined by evaluating the performance of health workers who have undergone IPE learning. It is hoped that these health workers, in carrying out disaster management, can apply IPC. The results of this impact evaluation will form the basis for planning the next IPE implementation. The study used a questionnaire (observation sheet) to measure the collaboration skills of students when faced with emergency cases before and after the implementation of IPE using the IPE model compiled by researchers.

Potential bias in this study is that the collaboration skills that respondents gain may come from their abilities after participating in classroom and field learning for several years. Therefore, we anticipate the possibility of this bias by taking respondents at the same level and semester, namely, final semester students.

The data obtained are then processed using SPSS. Data analysis uses the Wilcoxon test to assess the collaborative abilities of students before and after IPE implementation with a model developed by researchers. This research has been declared to be ethically appropriate in accordance to seven WHO 2011 standards by Health Research Ethics Committee of Manado Health Polytechnic, Indonesia, ethical approval number 297/KEPK/VII/2019.

Results

From Table 1, it is found that the most of the respondents are male, the most of the respondents are 20 years old, and the most of the respondents are from the Department of Nursing.

Table 1: Subject's general characteristic

Characteristic	n (%)
Sex	
Female	68 (86.07)
Male	11 (13.92)
Age (years)	
19	33 (41.77)
20	46 (58.23)
Department	
Midwifery	16 (20.25)
Nutrition	11 (13.92)
Pharmacy	14 (17.72)
Dental Health	17 (21.52)
Nursing	21 (26.58)

Collaborative capabilities before and after IPE learning

From Table 2, it is found that there is an increase in the collaboration ability of respondents after being given IPE learning, seen from the mean, median, minimum, and maximum values.

Table 2: Statistical test results of collaborative capabilities before and after IPE learning

Value	Pre-test	Post-test
N		
Valid	79	79
Missing	0	0
Mean	83.04	130.78
Median	84.00	135.00
Std. Deviation	21.934	14.530
Minimum	30	79
Maximum	124	150

IPE: Interprofessional education.

Based on Table 3, the average value of post-test has increased by 130.78 from the average pre-test score of 83.04. Wilcoxon statistical test results showed $p = 0.000$ (<0.005), which means an increase in collaboration skills after respondents were given disaster management IPE learning through the Virtual Health Polytechnic Ministry of Health Manado.

Table 3: Wilcoxon test results collaborative ability before and after learning IPE disaster management based on virtual learning Poltekkes Kemenkes Manado

Before and after Learning IPE Disaster Management	n	Average \pm SD	p-value
Collaboration ability before learning IPE	79	83.04 \pm 21.934	0.000
Collaboration ability after learning IPE	79	130.78 \pm 14.530	

IPE: Interprofessional education.

Discussion

The results showed that the IPE model developed was effective in increasing the collaboration skills of respondents. The increase in collaboration skills in this learning shows that the IPE disaster

management learning process utilizing Vilep is effective in increasing the IPE competence of students. The increased collaboration ability of students can be achieved supported by several things. The first is the IPE model developed. This model has previously gone through the planning stage before entering the implementation stage. In this planning stage, a learning module is compiled consisting of four learning activities according to the four IPE competencies. Each learning activity is equipped with a task that directs the respondent to understand the material before they can answer the task. In addition, the IPE course for disaster management at the virtual learning in Manado Health Polytechnic is also equipped with a learning video. The video is not the work of a researcher but is an upload from YouTube. The existence of videos and materials in Vilep is very helpful for respondents in understanding how to carry out disaster management in IPC.

The second thing that supports the improvement of respondents' collaboration skills is their willingness to follow the whole process well. To take part in this research, respondents had to take several stages of training, namely, pre-test, e-learning through the Village Health Polytechnic of Manado, doing module assignments and uploading in Vilep, classical learning, and post-test. Even though this model is well-developed, if education participants do not follow the process well, then collaboration skills are unlikely to experience a significant increase.

This is in line with the statement from Kurniawan that the ability to collaborate interprofessionally does not just appear, but must be found and trained from an early age starting from the lecture stage so that students have knowledge and skills [18]. In the world of health, IPE can be realized if students from various study programs in the health sector and related disciplines discuss together about the concept of health services and how their quality can be improved for the benefit of the wider community. When the students' knowledge is increase, it will be positively in line with the resilience of the students which is show the capability of students' preparedness for the disaster [19].

Another thing that can support the improvement of students' collaboration skills is the presence of competent facilitators who can direct respondents to understand the IPE disaster management learning material. With the increased collaboration skills of students, it is hoped that they will later become health workers who are able to collaborate in treating patients both in the community and in the hospital. With the ability to work collaboratively, it is hoped that health workers will have a positive impact in solving various health problems and a sympathetic heart to care each others [20].

The results of this study support research conducted previously by Mulyati and Trimarlina which found that students' collaborative abilities increased after being exposed to IPE learning [21].

Students realize that, to be able to provide patient-centered care, collaborative abilities are needed and to cultivate the ability to collaborate, it takes habituation or consistent practice both in classroom or laboratory learning as well as in real clinical and community settings comprehensively for all of aspects in life such as biological, psychological, sociological, and cultural aspect of the community [22]. The result of Heiddy Digregorio's research identified the need to integrate interprofessional competencies in disaster preparedness education [23].

The results of this study also support the Lachman and Paulina theory that, through the IPE learning process, students can develop the skills needed for team success, analyze both individual and group actions that contribute to team functioning, and decide how to follow up [24].

According to Illingworth and Sonya, IPE is an innovative learning method that can provide many benefits for students who are prospective health workers. After students between professions learn together, the level of knowledge they get will increase, making them more confident in their respective professions. The joint learning process enables them to transfer the knowledge and skills that have been acquired in solving various cases of disease so that it will become a reference material for students of other professions [25].

The results showed an increase in collaboration skills after respondents were given IPE disaster management learning through Virtual Learning Poltekkes Kemenkes Manado. The given learning process is effective in increasing the respondents' collaboration skills. The learning process of IPE follows a model developed by researchers that start from planning, implementation, and evaluation which subsequently produce an impact both for students and for improving the quality of health.

The results of this research will certainly have an impact on the development of knowledge and research. With the development and implementation of the disaster emergency IPE learning model in educational institutions, it is hoped that it can provide the right perspective for health workers about other professions and also provide knowledge to them on how to provide health services to patients by implementing IPC. The results of this study can also be a reference for researchers if they will carry out research on similar topics.

This research has the potential to have limitations, mainly because it was only conducted at one institution; moreover not all majors in this one institution were involved so that the research results could not be applied in general. The results of this study can add insight to health educators in all educational institutions in the world about models that can be used in IPE disaster management learning.

Conclusions

The collaborative ability of students increases after attending the IPE Virtual Learning in Disaster Management Collaboration, the developed IPE model consists of planning, implementation, evaluation, and impact and is effective in enhancing student collaboration skills. It is recommended to the education institution to facilitate the formation of disaster management IPE using *course blended learning* (a combination of *e-learning* and classical methods).

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