



Application of concept mapping in telepharmacy model development for prescription filling at primary care clusters

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Received: April 16, 2022

Accepted: July 30, 2022

Published: January 16, 2023

ABSTRACT

Background: Although the Pharmacy Council of Thailand has announced a standard telepharmacy service procedure, there may be some details or limitations that are specific to the primary care cluster (PCC) in the real situation. **Objective:** This research aimed to create a telepharmacy service model for the PCC using concept mapping techniques. **Methodology:** Group discussions were held, each participant will submit their opinions and graded of importance and possibilities of each opinion. After that, the data obtained were statistically analyzed to create a concept mapping. **Results:** From the group discussion, ($n = 10$) can be concluded that the optimum telepharmacy services with five groups which are (1) communication technology, (2) coordination between PCC and pharmacies, (3) coordination between village health volunteers and pharmacists, (4) patient selection for the telepharmacy services, and (5) telepharmacy services management and all five groups had the same level of importance and possibility. **Conclusion:** The PCC telepharmacy services should bring all groups of opinions together in the actual practice. Concept mapping helps the researchers decide which point to focus on. In addition, it was found that both group discussions also contributed to the team development, according to Tuckman's theory.

Keywords: Concept mapping, telepharmacy, fill prescription, primary care cluster

INTRODUCTION

Importance and Background of the Problem

Primary care cluster (PCC) Wat Nong Waeng is one of the PCC in Muang District, Khon Kaen, Thailand, which is under the supervision of Khon Kaen Hospital. It provides primary health services for a population of 10,000 people with pharmacists as part of the team. In respect to patient care services, the Family Care Team rotates to provide primary care services in the area of responsibility on a specific date and time,^[1] resulting in the absence of being present every day in each area. This can lead to drug and self-care problems of patients in the future.

Many countries have adopted telepharmacy services to solve the problem of the shortage of pharmacists, for example,

the United States,^[2] Australia,^[3] Denmark,^[4] Singapore,^[5] and China.^[6] Thailand is one of the countries that focuses on promoting telepharmacy campaigns as a result of the announcement of the pharmacy council on the set of standards and procedures for the provision of telepharmacy services. The definition of telepharmacy services from the draft regulations of the Pharmacy Council of Thailand, the American Society of Hospital Pharmacists, 2016, and the National Association of Boards of Pharmacy is defined as distant pharmaceutical care using communication technology.^[7,8] Moreover, research has found that telepharmacy has a demonstrated value in medication selection, order review, and dispensing; intravenous admixture verification; patient counseling and monitoring; and clinical services.^[2]

As the research team wanted to tackle the shortage of pharmacists for the PCC, telepharmacy services were used to fill

prescriptions with Remote Dispensing and Remote Counseling. According to other research, the most popular technology used to communicate in the telepharmacy service is the video call method, which can display a video with sound,^[3-5,9,10] while other popular technologies are through mobile phone,^[9-11] webcam,^[10] text, and message (chat-based).^[4] Robots are also being used in organizing drugs in conjunction with drug arrangements by people in certain countries.^[9,11] In Australia, information is passed on and recorded by doctors and pharmacists online,^[3] unlike Denmark and the United States where there is a staff who records and transfers information from hard copy to an online system.^[4,9,11] This shows that each country has different methods or technologies to provide the services, depending on the suitability of country's public health system.

Although the Pharmacy Council of Thailand has announced a standard telepharmacy service procedure, there may be some details or limitations that are specific to the PCC in the real situation. Therefore, brainstorming by the persons involved in the service is essential to improve the telepharmacy service process to make the service more suitable and practical. Furthermore, the organization of group discussions requires good management and planning that maximizes information and opinions of all parties to obtain information that can be analyzed and applied to work properly in the future.

However, the organization of a group from diverse groups of people can create a disparity in opinion-making. According to research by Vaughn, Jones, Booth, and Burke (2017), concept mapping can help to develop community engagement, where community members can become part of the research participants by setting up issues and helping to find solutions that will provide better results than asking conventional questions.^[12] Moreover, concept mapping helps researchers initiate conversations to receive multiple perspectives, and the use of concept mapping through a computer program in Trochim (2017) was found to have an effect on reducing the influence of authority, as each participant was able to express their opinions anonymously. The truthful data obtained through a non-personal computer program can be analyzed, thus equalizing the information and preventing a bias of opinions.^[13] For this reason, the research team has adopted concept mapping for use in its operation.

Concept mapping can help to organize groups of ideas by relationships or similarity, with a top-down arrangement. The concept mapping that is suitable for this research is Type 2 mapping or a group concept mapping. This technique combines the ideas of diverse groups of people with similar interests and is then analyzed by statistical analysis to create a concept that shows the relationships of similar ideas together or called "Concept mapping", which is combined into a cluster to form a point of opinion within a different geometric framework.^[14] This would suggest those opinions that are relevant, and which issues should be prioritized to plan and develop the work process to ensure that patients receive suitable standard and effective pharmaceutical services. Rodchares Nitipaichit summarizes the application of Trochim's 6-step concept mapping technique in the Thai version of the research.^[15]

Objectives

This research aimed to create a telepharmacy service model in the case of filling prescriptions for the PCC using concept mapping techniques.

Research Process

Organizing group discussions in both sessions to find suitable telepharmacy service processes for the PCC at PCC Wat Nong Waeng from the perspective of those involved in providing immediate post-dispensing advice through the telepharmacy services.

Participants

Participants of this research were selected from those involved in the PCC telepharmacy service process at Wat Nong Waeng Primary Phra Aram Luang care cluster.

Methodology

Researchers created an enhanced concept mapping of Trochim's 6-step^[15] as shown in Figure 1.

Each step is detailed as follows:

Step 1 - preparation

The first group discussion considered the meaning of "Telepharmacy", examples of Telepharmacy, Telepharmacy guidelines from abroad, and the standardization and procedures for the telepharmacy services from the Pharmacy Council of Thailand announcement to provide the information for people in the discussion group to understand the telepharmacy service from the same view point. Then, the members later developed focus statements to define the boundaries of a clear concept mapping.

Step 2 - brainstorming

Each participant submitted their opinions in response to the focus statements identified in Step 1 by writing their own opinions on paper anonymously with no limits on the number of comments. After that, gathered opinions were projected on the projector screen for participants to explain their opinions together for mutual understanding, and then add numbers to order their opinions.

Step 3 - grouping and rating opinions

Participants were divided into two groups. Group 1 was the family care team who graded and grouped through Google forms while Group 2 was village health volunteers (VHV) who graded and grouped opinions through interviews. Then, the results can be arranged in the following order:

Grouping opinions

The item numbers from Step 2 were arranged in an Excel table in both rows and columns. Then, participants grouped them by putting 1 in items in the same group and 0 in items that were not in the same group.

Grading importance points

The importance points are the degree of impact of the process on the quality of work. Grading was done by putting all the text together in an Excel table and making rows as a comment

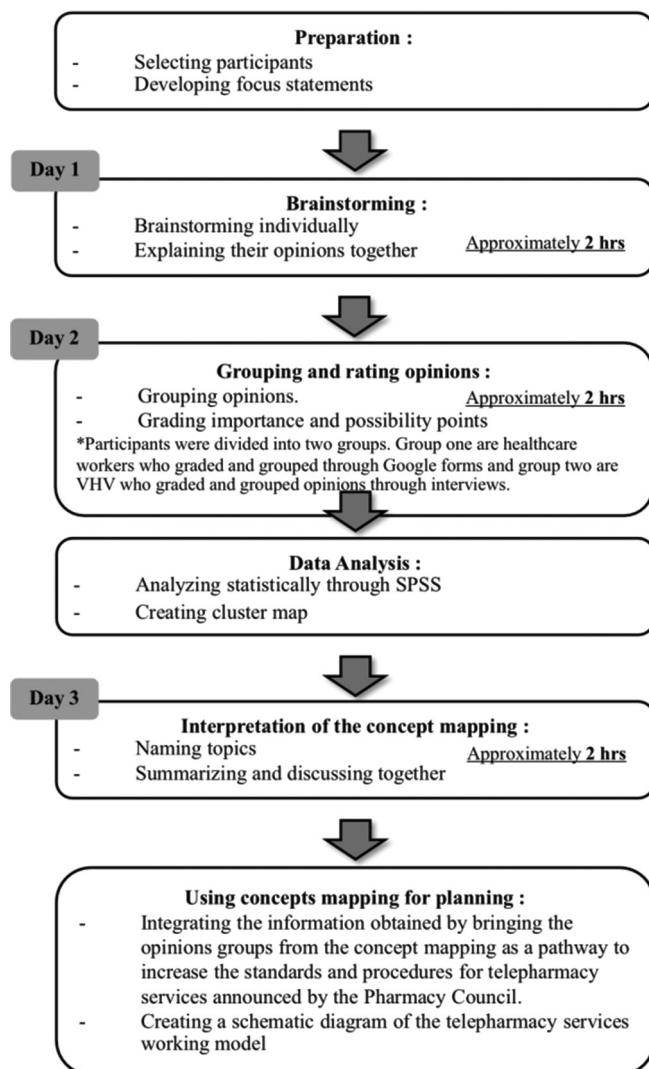


Figure 1: The conceptual team plans for the development of the telepharmacy model in the case of filling prescriptions for the PCC

section and columns as an importance points section. Scores were divided into five categories: 1 = Not important at all, 2 = Not important, 3 = May be important, 4 = Important, and 5 = Most important.

Grading possibility points

The most important point is the degree of impact of the process on the quality of work. Grading was done by putting all the text together in an Excel table and making rows as a comment section and columns as a possible points section. Scores were divided into five categories: 1 = not possible at all, 2 = Not possible, 3 = May be possible, 4 = possible, and 5 = Most possible.

Step 4 - data analysis

The classification and scoring of the data obtained were statistically analyzed through the SPSS program as follows:

Grouping opinions

The analysis of the results began by calculating the mean score obtained in 2.2.3.1. The mean obtained was analyzed in the commanded version of the SPSS program with the

multidimensional scaling command (PROXSCALE). Further details can be studied from the research of Nitipaichit.^[16]

Charting the levels of importance and possibilities

The scores obtained from 2.2.3.2 to 2.2.3.3 were taken to find the mean of each group to make a vertical chart. The scoring range was assigned five categories as in Step 3, and both axes were assigned the same value by writing the group names from top to bottom, sorted by the average score in each group descending, making it possible to compare the importance and the possibilities of each group more clearly.

Step 5 – interpretation of the concept mapping

In this process, participants named the topics that corresponded to the subset of their comments. If there were some heterogeneous groups of ideas, the problem could be solved by splitting the comment into two groups or combining it together. Once the topics of all discussion groups were obtained, the map was presented to be summarized. By moving comment groups, the average score was calculated and revised again on the vertical chart and determined in the order of mean score with the higher grade groups being added to the flowchart first.

Step 6 – using concept mapping for planning

This step was to integrate the information obtained to develop the operating system by bringing the opinions groups from the concept mapping as a pathway to increase the standards and procedures for telepharmacy services announced by the Pharmacy Council of Thailand. In addition, the researchers also created a schematic diagram of the telepharmacy services working model for the Wat Nong Waeng Primary Phra Aram Luang care cluster.

STUDY RESULTS

Preparation

A total of 10 participants in the group discussion including one doctor, two pharmacists, one nurse, one pharmacy assistant, and five VHV who participated in all the activities throughout the study.

In the first group discussion, the focus statement for commenting on the topic was: What should the immediate post-dispensing advice of the telepharmacy services be?

Brainstorming

In the first group discussion, there were 26 comments which were scoped down to 17. Afterward, group members analyzed their comments together.

Analyzing and Interpretation

From a group discussion, comments can be grouped and given points of importance as follows:

Grouping

The comments obtained from groupings were grouped using the SPSS program to create a cluster map that showed all eight groups of comments. However, the second group discussion that examined the appropriateness of the actual operation resulted in a change of grouping into five categories of comments as in Figures 2.1 and 2.2.

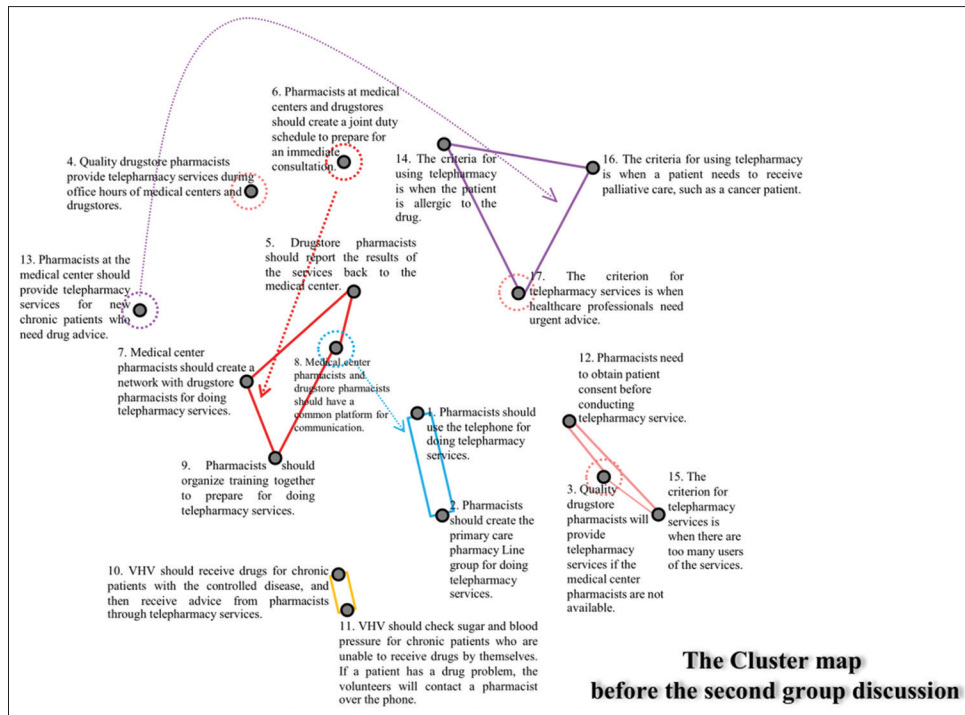


Figure 2.1: The cluster map before the second group discussion

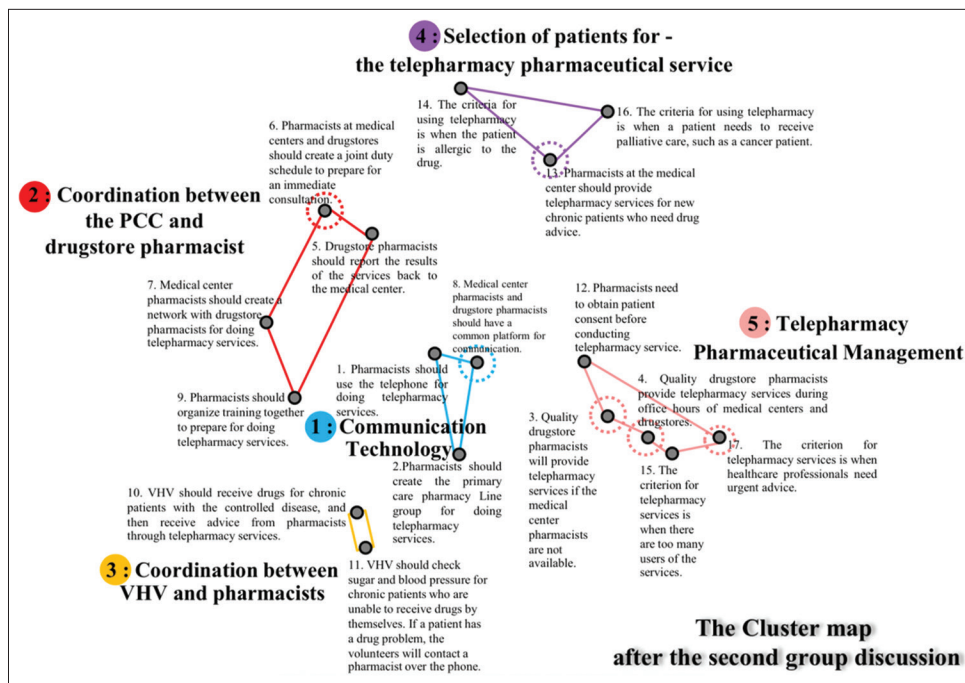


Figure 2.2: Named cluster map after the second group discussion. The numbers indicate the order of the sub-comments and the comments in the dashed circles are the comments that have been moved in the second group chat. Furthermore, the dashed arrow indicates the appropriate group for the comment

Importance and possibilities

The scores of importance and possibilities for each group were combined into a vertical chart with the highest score of 4.7 and the lowest score of 4.0. The scores from 1 to 5 can be summarized according to mean score order, important

opinion groups, and possibilities. The first is Group 2 which is the coordination group between the PCC and the drugstore. Second is Group 3 which is coordination between VHV and pharmacists. Third is Group 4 which is patient selection for the telepharmacy service. The fourth Group 1 is communication

technology. The fifth is Group 5 for telepharmacy management. We found that all five groups had a level of importance from important to most important and a degree of possibility from possible to most likely to be possible. The scores, importance, and possibility of each group are shown in Chart 1.

The Use of Concept Mapping for Planning

Service procedures

From the two group discussions, the research team adapted the opinions gained from the group discussions in accordance

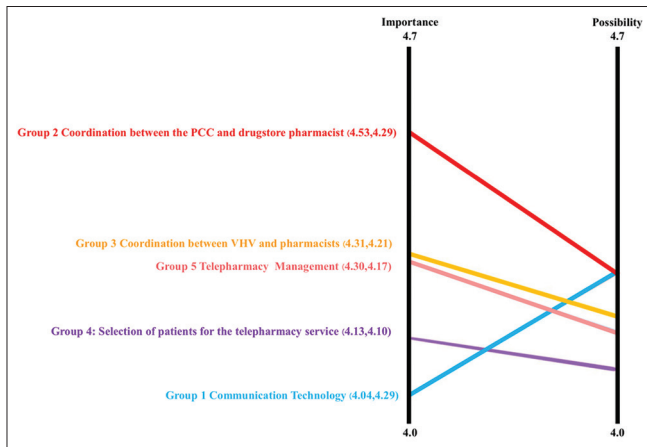


Chart 1: Average score of importance and possibility

with the standards and procedures for the telepharmacy service announced by the Pharmacy Council of Thailand. The immediate post-dispensing criteria of telepharmacy services were applied when there were a large number of clients or when a patient meets certain requirements of the telepharmacy criteria. Patients were required to register their consent, after which they received the telepharmacy services from pharmacists based at PCC. If a pharmacist at PCC was not available, the pharmacist from a drugstore provided the service for patients through convenient communication technology to conduct interviews with the patient or advise about the medication as shown in detail in Figure 3.

DISCUSSION AND CONCLUSION

From the group discussion, it can be concluded that the optimum telepharmacy services of the PCC is the immediate post-dispensing guidance service with five groups of comments which are: (1) Communication technology, (2) coordination between PCC and drugstore pharmacists, (3) coordination between VHV and pharmacists, (4) patient selection for the telepharmacy services, and (5) telepharmacy services management. From the results of importance and possibilities scores, we found that all five groups of opinions had a level of importance from important to most important and a degree of possibility from possible to most likely to be possible. Therefore, the PCC telepharmacy services of Wat Nong Waeng Primary Phra Aram Luang care cluster should bring all

A Flow Chart of Telepharmacy

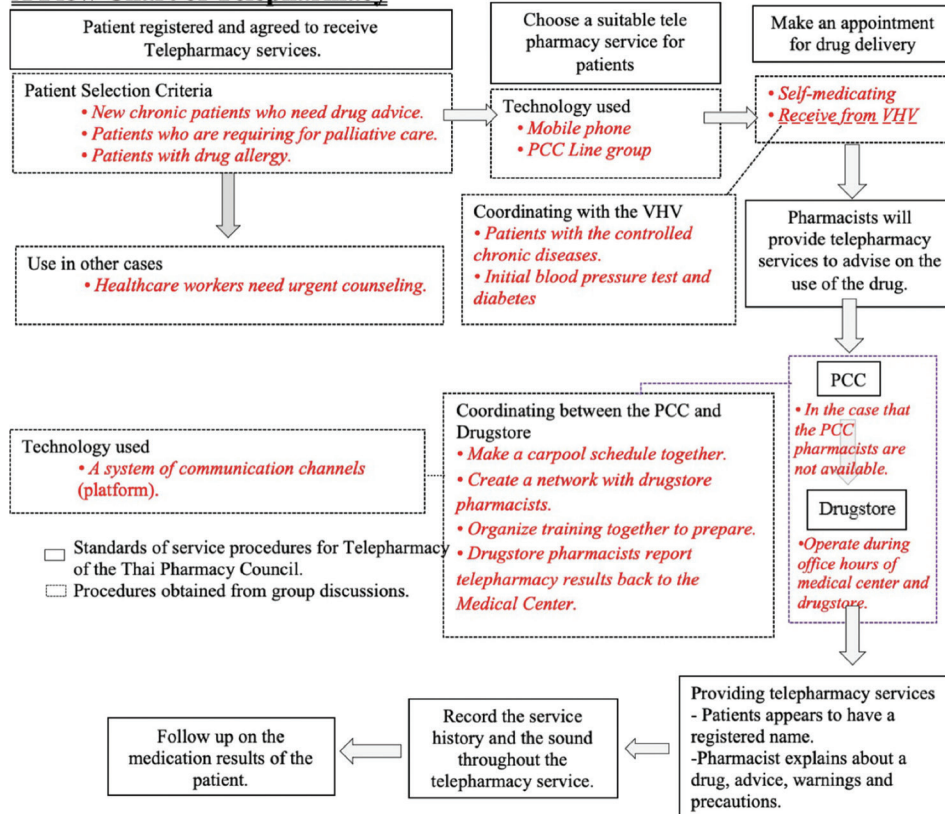


Figure 3: A schematic diagram of the telepharmacy service for PCC designed from concept mapping. The red text in italics is comments derived from the concept mapping

groups of opinions together in actual practice as shown in the flowchart in Figure 3.

This research is also consistent with the literature review on the telepharmacy service standards of the United States,^[3] Singapore,^[5] and the announcements of the Pharmacy Council of Thailand^[8] on many issues. In terms of technology, the technology used should be appropriate to support patients and should be able to record video or audio data. In the case of our study, we are of the opinion that a mobile phone or line application should be appropriate for communication. In terms of long-distance drug delivery to patients who are unable to receive the drugs at PCC, our group believes that the village health volunteer should be the drug delivery leader. In addition, the provider should only be a pharmaceutical practitioner and a drugstore pharmacist should replace this person; in case, the PCC pharmacist is unable to provide the services for patients. For this reason, pharmacists should be trained to prepare before providing additional services and have a shared duty schedule and a good referral system. In every service provision, consent from the patient is always required and the service model provided by the group discussion will be subject to the telepharmacy services standards as announced by the Pharmacy Council of Thailand.

The team also found that concept mapping can reduce the influence of authority and create equality as the participants can anonymously write their opinions on paper (Trochim and Kane, 2017; Plaut *et al.*, 1992; Risisky *et al.*, 2008).^[14,16,17] This helps the researcher in deciding which areas to focus on, that is, that are possibilities, importance, and insights from a target participant (Rosas and Ridings, 2017).^[18] Concept mapping also helps address local operator problems and needs (Kelly *et al.*, 2007),^[19] and in line with Vaughn *et al.* (2017) on data equality.^[12] In our research, participants were asked to anonymously give their opinion, thus allowing the researchers to initiate conversations from a wide variety of perspectives and foster community engagement in giving opinions. This makes it possible to truly know the needs of the people in the community. The use of concept mapping also assists researchers in conducting research work, which is consistent with Trochim (1989) where the investigator is the only process manager, and the content, interpretation, and use of the mapping are determined by the group themselves.^[20]

In addition, it was found that both group discussions also contributed to the development of the team based on Tuckman's four-stage model of group development, which is a successful concept as in the Mungia *et al.* research (2015).^[21] The concept of promoting collaboration between the operator and the researchers was developed in three out of four phases, with the first phase occurring in the first group discussion in the preparation, which is the forming phase. This phase is to create a network of people with different skills and experiences to realize different perspectives and working methods. The second phase is the storming phase, which occurs when everyone in the group offers their own opinions that will lead to team development. This phase gives participants a wider perspective, determines the direction of how the group works, and begins to realize the extent of their work. The third phase is the norming phase, which is formed from the second group discussion. This phase brings together the different opinions

of each person together to create concept mapping and an operating plan. This will help the team visualize the teamwork and the role of each individual for the telepharmacy service in the future.

LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Even though concept mapping can reduce the influence of authority and create equality during the group discussion (Trochim and Kane, 2017; Plaut *et al.*, 1992; Risisky *et al.*, 2008),^[14,16,17] in the first group discussion, some VHV did not give their opinion. From the inquiry, the research team found that this problem arises from the knowledge base of telepharmacy that is not equal between the medical care team and VHV. Therefore, before the group discussion should be trained on related topics. In a second group, discussion participants were divided into two groups. Group 1 is family care team and Group 2 is VHV to give the VHV an opportunity to ask questions. The VHV was shown to be more confident in asking questions. As a result, VHV has contributed more viewpoints in a group discussion to summarize the results. However, it is important to integrate the two groups so that each individual can view different perspectives and issues, to make their opinions are varied and inclusive as possible in all areas of practice. Therefore, It is a practice procedure that leads to an appropriate conclusion that everyone can implement.

ACKNOWLEDGMENTS

The research team would like to thank the Health Technology and Policy Assessment Program, Faculty of Pharmaceutical Sciences, Khon Kaen University that supported the research budget and we would like to thank the Family Care Team at PCC Wat Nong Waeng and Village Health Volunteers who participated in this study.

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