

Original Research

Empowerment interventions for pharmacies to comply with the Good Pharmacy Practice (GPP) in Thailand

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Abstract

Good Pharmacy Practices (GPP) is to provide people with quality pharmacy services as well as to promote drug use safety. **Objectives:** To find out the effect of the process of empowering modern pharmacies to meet the GPP standards and to investigate the problems and obstacles that affect the pharmacy licensees in complying with the GPP. **Methods:** An action research using the Deming Cycle (PDCA) to design a process, in collaboration with relevant parties, to promote GPP compliance. The process consisted of a group intervention and an individual intervention designed to be consistent with the SOAP assessment. The action plan was implemented over a 9-month period. The GPP outcomes were assessed. Samples were 32 pharmacy licensees in Nakhon Ratchasima Province, which have not yet passed the GPP assessment. They were randomly selected by the stratified sampling method. **Results:** After participating in the empowerment process, there were 62.50% or 20 pharmacies passed the GPP assessment in all categories. The average GPP compliance score had statistically significantly higher than before the process ($p < 0.001$). For the satisfaction of the participants, the overall score was at the highest level. **Conclusion:** The process of empowering modern pharmacies to meet GPP standards showed a positive effect. The rate of pharmacies that passed the GPP criteria also increased. In addition, the participants in the process were highly satisfied. Therefore, the PDCA cycle should be used in pharmacy development. Meanwhile, GPP self-assessment is a tool to help pharmacy licensees in systematic problem resolution..

Keywords: empowerment; pharmacy licensee; good pharmacy practice; quality cycle; compliance

INTRODUCTION

There are differences for each country in the pharmacy profession practices. It is the result of their knowledge transition and development. Before 1992, there was no international and formal standard for community pharmacy services. Later, Good Pharmacy Practice (GPP) was developed by the International Pharmaceutical Federation (FIP) to describe and clarify the scope of responsibility of the pharmacy profession. Eventually, in May 1994, the World Health Assembly, the decision-making body of the World Health Organization (WHO)¹ adopted the resolution WHA 47.12 on the role of the pharmacist in support of the WHO revised drug strategy, which encourages the Member States to use the GPP in drug management. Afterwards, the European Union began to develop documentation on the GPP, along with many other countries that have applied the principles of pharmacy practice in policy making and the development of pharmacy practice at the national level. In 1999, the WHO, together with the FIP, announced the GPP as guidelines on pharmacy practice for relevant agencies of each country to implement to suit them depending on their nature. The GPP is the key principle of the pharmacy profession. It is a pharmacist's practice, which is important for the pharmacist

responsible for providing quality drugs and health products for patients, providing professional pharmacy advice, dispensing medications when necessary, and monitoring the effects of medication use. There also have effective communication skills with everyone involved and collaborate with multi-professional teams or between health professionals. Pharmacists are also responsible for reporting adverse events, drug-related problems, and medication errors. That will support the proper drug use as well as promote the prevention and treatment of disease.² The joint FIP/WHO guidelines on good pharmacy practice: standards for quality of pharmacy services are widely applied around the world.³

The current pharmacy situation has found that the GPP is applied globally. The literature review found that the developed countries in the Americas and Europe can adopt the principles of the GPP as a standard in their pharmacies.⁴ Pakistan,⁵ India,⁶ Lebanon⁷ and Iran⁸ are in the early stages of the GPP implementation. While Korea is under consideration.⁹ For Thailand, the concrete implementation of the GPP occurred in 2003,¹⁰ with the cooperation of the Food and Drug Administration (FDA) and the Community Pharmacy Association (Thailand), to develop pharmacy standards under the project "Accredited pharmacy" on a voluntary basis.¹¹ Later, the Thai FDA established the criteria for assessment according to the regulations and announcements of the Ministry of Public Health, which consists of 5 categories; 1st place requirements; 2nd equipment for sale, store, and control the quality of drugs; 3rd personnel; 4th quality control; and; 5th pharmacy services.¹² In the GPP assessment, each domain required shall not be less than 70%, and any critical defect shall not be found.

In Nakhon Ratchasima Province, 2020, there is 409 licensed

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modern pharmacy still operating,¹³ most of them located in the Muang Nakhon Ratchasima district. There were 177 pharmacies which have been issued a license before 25 June 2014. However, only 67 pharmacies or 37.85%, passed the GPP criteria on place requirements, equipment, and community pharmacy practices, while another 62.15% need to improve to meet the specified criteria. It is in line with the study by Panuchot Thongyang and Komtuan Komwutikarn,¹⁴ who found that 96% of pharmacies need to improve within 8 years in order to meet the specified criteria. For the pharmacy in Nakhon Ratchasima, it was found that 86.28% of the requirements of the 1st Category and 80.87% of the 2nd Category were met.¹³ The category that has not yet reached the specified criteria, which passed only 42.60%, is category 4, quality control, in which pharmacies do not have a system to inspect the quality of returned/changed drugs or replace them before bringing them back to the shelf, considering the efficacy of drugs and the patient safety, a system for the correct return or dispose of expired in according to GPP.¹⁴ The licensees of the pharmacy need more government assistance, support and empowerment in matters that affect compliance with the requirements of the Ministerial announcement. The researcher is of the opinion that the development of pharmacies towards the GPP standards should be promoted intensively and proactively. Therefore, there is interest in the development of guidelines for promoting modern pharmacies to comply with the GPP. It also includes jointly pushing promotion according to the designed guidelines. The purpose is to provide a solution that supports modern pharmacies in the targeted areas to meet the requirement within the time frame specified by law.

OBJECTIVES

To study the results of the empowerment interventions for modern pharmacy in Nakhon Ratchasima Province to be able to develop and meet the GPP standards.

To detect problems and barriers for the pharmacy licensees to comply with the GPP.

To assess the satisfaction of the pharmacy licensees with the process of empowering pharmacies toward the GPP.

Ethics approval

This study was considered for human research ethics by Nakhon Ratchasima Provincial Public Health Office, with reference number NRPH 060, and by Mahasarakham University, reference number 382-378/2564.

Research methods: An action research with mixed methods conducted jointly by licensees of non-GPP and GPP pharmacies, pharmacists, and staff of the consumer protection in the pharmacy and public health section of the Nakhon Ratchasima Provincial Public Health Office. There are steps for implementing the PDCA quality cycle for empowering as follows:

Planning stage (Plan) - Using the information on the factors of pharmacy licensees that affect the GPP compliance as well as problems and obstacles, to design a process to promote modern

pharmacies in Nakhon Ratchasima Province to comply with the GPP standards. A focus group discussion by a collaborative team of 10 people was used, which resulted in protocol and guidelines for empowering GPP in 2 interventions:

Group intervention, which is a group activity focused on understanding the GPP criteria and learning from experienced people in order to achieve empowerment under the criteria; and;

Individual intervention is an activity for each pharmacy, which is a tailor-made intervention based on the nature and problem conditions of each pharmacy and designing the empowerment process to suit each pharmacy.

Doing stage (Do) - This is the implementation of the planned directions in the planning stage, which consists of 2 Interventions:

Group Intervention: by reviewing knowledge of the GPP criteria, increasing attitude toward behavior and perceived behavioral control. It is a group meeting to exchange experiences as well as recommend pharmacy development methods based on criteria from one who has met the GPP, increasing a subjective norm to trigger factors affecting GPP compliance according to the theory of planned behavior (TPB).

Individual intervention starting from the licensee take a self-assessment to be used as information in planning and determining the development period of the pharmacy based on the issues that have not been met. The researcher will provide advice, supervision and follow-up monitoring for each specific pharmacy.

Checking stage (Check) - The researcher closely monitors the development of the pharmacies. The follow-up period was 1-2 months. And the SOAP assessment has been used as follows:

S: Subjective Data is an evaluation of pharmacy development problems from each pharmacy licensee.

O: Objective Data is an assessment of pharmacy development problems based on the GPP criteria from self-assessment and the GPP assessment results.

A: Assessment is an analysis of pharmacy development issues and GPP compliance. It also provides recommendations for meeting the GPP criteria.

P: Plan is a follow-up plan, problem-solving, follow-up period, and appointments.

Actioning stage (Action) – It is a comparison of the GPP compliance results before and after joining the operation and assessing pharmacy licensees' satisfaction. After assessment, those that haven't met the required GPP criteria will join the 2nd development PDCA cycle (Figure 1).

Population and sample

Stakeholders and those involved with the GPP include licensees of modern pharmacies, pharmacists working in pharmacies, representatives from the Nakhon Ratchasima Pharmacy Group, and officials from the Provincial Public Health Office. A total



Empowerment and Support Process for Pharmacy licensees to comply GPP

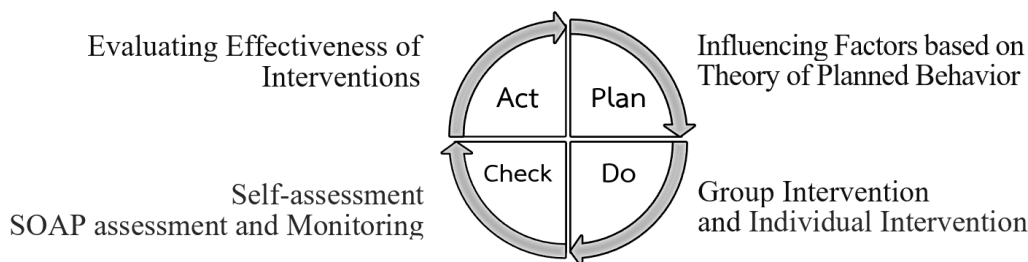


Figure 1. Action research using PDCA cycle for implementation

of 10 people was selected. They were selected from people who were interested in the GPP and willing to participate and provide information.

32 licensees of the modern pharmacy have participated in the operation of developing modern pharmacies in Nakhon Ratchasima Province to meet the GPP standards. The sample size was calculated using the formula Comparing MEAN between 2 paired groups at a confidence level of 95% (Allowance for loss 20%).¹⁵ By stratified random sampling according to 2 communities characteristics, 14 pharmacies in Mueang district and 18 pharmacies outside Mueang district, which is the proportion of the pharmacy in the actual two areas.

Research instruments

Focus-group-discussion record form to obtain information on problems, obstacles, and support needs. To jointly design protocol and guidelines for empowering and developing pharmacies towards GPP standards.

The satisfaction questionnaire on the empowerment and development of modern pharmacies in Nakhon Ratchasima Province to the GPP standard consists of 4 items. Answers were divided into 5 levels according to the Likert rating scale (1=least satisfied-5=most satisfied).

The FDA's standardized assessment form on GPP compliance of pharmacies consists of 5 categories: 1st place requirements, 9 items, 26 points; 2nd equipment, store, 6 items, 16 points; 3rd personnel, 5 items, 12 points; 4th quality control, 7 items, 22 points; and 5th pharmacy services, 12 items, 38 points; Total 114 points. It must pass in all categories with a score of 70% and an overall score of not less than 79.8 from 114.

Validation of research instrument

Content Validity of the questions used in the focus group discussion and the satisfaction assessment questionnaire on the pharmacy development process to meet the GPP criteria were processed by three experts — a pharmacist from the Food and Drug Administration, a pharmacist from the Provincial Public Health office, and a pharmacy lecturer who specializes in behavioral sciences. The questionnaire was improved according to the suggestion and analyzed the reliability of the satisfaction assessment form, by collecting data from a sample of 20 licensees of the modern pharmacy, which showed Cronbach's alpha coefficient of 0.817.

Data collection methods

Letters were sent by post, according to random sampling, to licensees in pharmacies that have not passed the GPP standard, 14 pharmacies in Muang District (43.6%) and 18 in other districts (56.4%). After that, make a call to confirm receipt of the post. The GPP assessment results of the participating pharmacies were collected for the overall and detailed analysis of each pharmacy to be used as inputs to focus group discussions.

In group discussions, the objectives of the study were informed, and the proposed activities with the date and time were scheduled. The discussions were conducted online through the Zoom Application. Data was collected by taking notes from 2 trained pharmacists.

In the process of empowering and developing modern pharmacies in Nakhon Ratchasima Province to meet the GPP standards, the researcher will provide recommendations and supervise the development of each pharmacy, individually. Evaluation of the development of the pharmacy after participating in the development process by 4 personnel of the Nakhon Ratchasima Provincial Public Health Office.

Data analysis

The data were analyzed using IBM SPSS Statistics 21. Statistics used in the research were descriptive statistics, frequency, percentage, mean, standard deviation, and inferential statistics. Paired t-test was used to study the relationship between the variables and compare the results of the GPP cooperation before and after the promotion process.

Study results

The results of this study consisted of 4 parts: 1) General characteristics of modern pharmacy licensees who participated in the study; 2) Problems, obstacles, and the need for support to develop pharmacies to meet the GPP standards; 3) Results of the empowerment and development of modern pharmacy to meet the GPP standards; 4) The results of the satisfaction assessment of the modern pharmacy licensees with the empowerment process to GPP, randomly selected from 32 licensees, it was found that 100% of them were willing to participate in the activity.

General characteristics of licensees of the modern pharmacy who participated in the study: It was found that there were 24 pharmacy licensees, or 75.00%, were female, with an average

age of 36.82 ± 6.669 years. Most of them were in the age range of 25–35 years, or 56.25%. The average time that running their business was 11.03 ± 5.835 years. Business openings are in the range of 8–32 years. The licensees who were pharmacists were 90.63%. The licensees who have a degree of Bachelor of Pharmacy were 93.74%. Pharmacies located in the Muang Nakhon Ratchasima District were 43.75%. With 84.38% being a stand-alone pharmacy. And found that 62.50% were open all day (more than 8 hours/day). The data is shown in Table 1.

General information	number (people)	percentage
Female	24	75.00
25-35 years old	18	56.25
Age between 28 – 57 years, mean ± SD 36.82 ± 6.669		
Business openings in the range of 8–32 years, mean± SD 11.03 ± 5.835		
The licensees of modern pharmacy who was pharmacists	29	90.63
The licensees who have a degree of Bachelor of Pharmacy	30	93.74
Located in Muang Nakhon Ratchasima District	14	43.75
Stand-alone pharmacy	27	84.38
Open all day (more than 8 hours/day)	20	62.50

Problems, obstacles, and the need of modern pharmacy licensees for support to develop pharmacies to meet the GPP standards

The focus group discussions in licensees who communicate their opinions independently concerning the problems, obstacles, and the need for support in the development of pharmacies to meet the GPP standards, can be summarized as follows.

Problems of developing pharmacies to meet the GPP standards

Problems include the burden workload from completing regulatory documents, general people in Thai society cannot differentiate between the GPP pharmacies and general pharmacies, and increased more steps in improvement process, particularly the place requirements. They did also give the opinion that some of the standards stipulated by the GPP are unnecessary, such as concealing a medicine shelf in case a pharmacy has no a pharmacist on duty at all times or the readiness of other personnel in pharmacies due to a lack of knowledge of the GPP standards.

Obstacles in developing pharmacies to meet GPP standards

Most of the respondents commented on the obstacles they found in the big budget that will be used to develop pharmacies to comply with GPP standards, pharmacy workers must understand how to comply with the GPP requirements, public understanding of the pharmacy’s GPP standards that affected the service, some requirements were not practical, lack of knowledge and understanding of GPP standards, unavailable training of pharmacy staff, were the obstacle to the development of pharmacies to meet the GPP standards from the licensee’s point of view.

The need for support in developing pharmacies to comply with the GPP standards

The licensees need assistance and support from government organizations or outsiders to develop pharmacies to meet the GPP standards, including support for equipment necessary and documentation. It also needs personnel to support organizing training courses for pharmacy staff in the knowledge of GPP standards and other laws on a continuous basis. Not only that, but they also need a piece of advice and support on public relations, advertising the GPP pharmacies, and providing media to the public, in order to understand the difference, as well as the benefits people will receive from dispensing drugs from the GPP pharmacies.

From the results of the focus group discussion, data were used to design an intervention to empower and develop pharmacies to meet the GPP. It was a 9-month empowerment and development process. The data is shown in Figure 2.

Results of the process of empowering and developing modern pharmacies to meet the GPP standards

Assessment scores based on practice in community pharmacies or the GPP: From the results of the analysis after participating in the empowerment and development process, it was found that GPP scores in both each category and overall were higher. The total score increased by 24.09%. In the 4th category, GPP score on quality control increased by 41.78%. It is followed by the 5th category of pharmacy services that increased by 27.71%. For the 3rd category of personnel in pharmacies, the 1st category of place requirement, and the 2nd category of equipment, the average score increased to 25.52%, 13.70% and 7.03%, respectively. An analysis of differences in GPP score percentages comparing before and after participating in the modern pharmacy development process found that the percentage of GPP scores in every category and overall scores of 5 categories after the process increased statistically

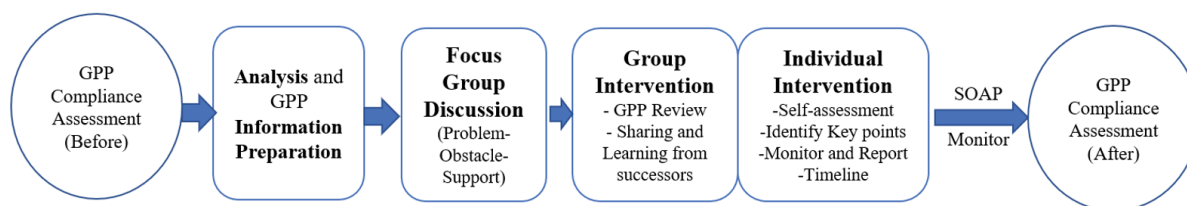


Figure 2. Research procedure for empowerment process

significantly higher than before the process ($p < .001^*$), as shown in Table 2.

Modern pharmacies that met the GPP standards: The results of the study of the pharmacy development process, it was found that 20 participating pharmacies passed all 5 categories of GPP assessment, representing 62.50%. However, there were 12 pharmacies or 37.50%, that did not pass and shall participate in the second development process. When considering pharmacies that pass the GPP assessment classified by category, it was found that the assessment criteria in the 1st category of place requirement and in the 2nd category of equipment were all modern pharmacies passing the assessment criteria. In the 4th category of quality control and the 5th category of community pharmacy practices, passed the assessment criteria of 31 stores or 96.88%. For the 3rd category of personnel preparation, it has met the criteria of only 21 pharmacies or 65.63%. Data is shown in Figure 3.

Satisfaction assessment results of licensees of modern pharmacies on the operation of empowering modern pharmacies to meet the GPP standards

The licensees of the modern pharmacy were most satisfied with the development process of modern pharmacy to meet the GPP standard with an average of 4.90 ± 0.154 from total 5 and with the self-assessment tool for monitoring and following-up. Secondly, they were satisfied with the developmental recommendation process by the researchers and a self-assessment process to monitor and follow-up, the mean scores were 4.88 ± 0.336 and 4.72 ± 0.457 , respectively. The data is shown in Table 3.

DISCUSSION

When considering the situation of modern pharmacy development in Nakhon Ratchasima Province, to the standards

Category	GPP score (Percentage score \pm SD)		Percentage of change in the GPP score	p value ^a
	Before	After		
1st Place requirements	86.30 \pm 7.752	100.00 \pm 0.000	Increased 13.70	<.001*
2nd Equipment	92.97 \pm 6.300	100.00 \pm 0.000	Increased 7.03	<.001*
3rd Personnel	54.17 \pm 14.042	79.69 \pm 14.500	Increased 25.52	<.001*
4th Quality control	44.32 \pm 14.375	86.10 \pm 9.515	Increased 41.78	<.001*
5th Pharmacy services	56.17 \pm 9.180	83.88 \pm 6.808	Increased 27.71	<.001*
Overall	65.71 \pm 2.620	89.80 \pm 3.134	Increased 24.09	<.001*

*Statistical significance at $p < 0.05$, *tested by Paired t-test

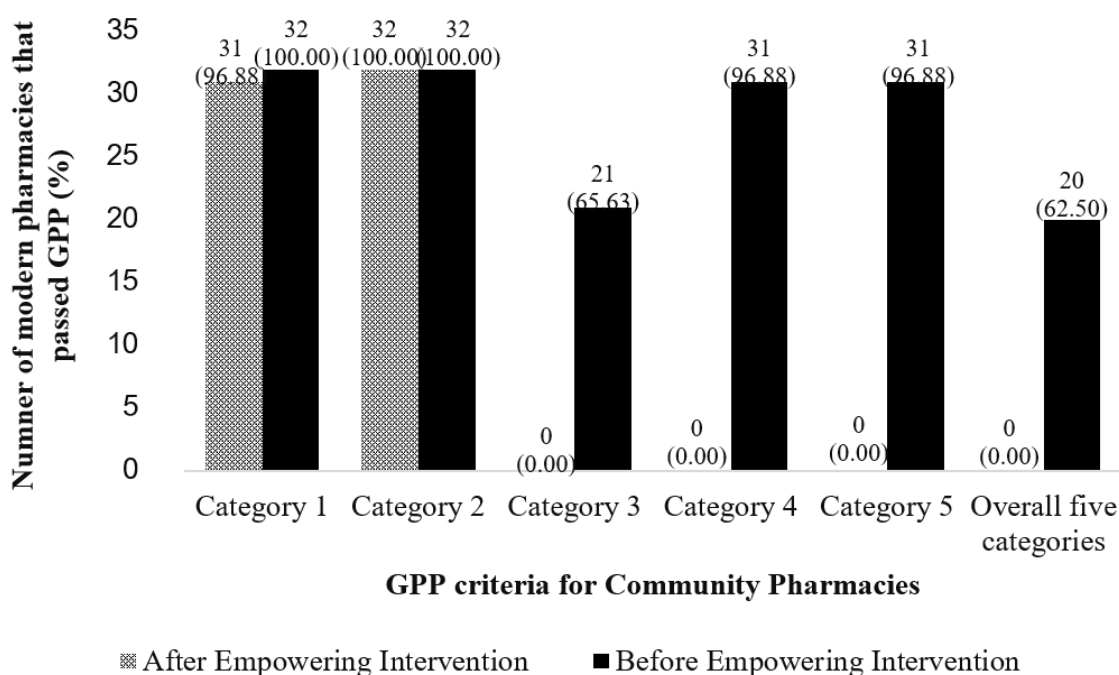


Figure 3. Number (%) of modern pharmacies that passed the GPP assessment before and after participating in the empowerment process (n=32)



Table 3. Satisfaction with the development process of modern pharmacies in Nakhon Ratchasima Province to meet the GPP standards			
Satisfaction with the development process of modern pharmacies in Nakhon Ratchasima Province to meet the GPP standards		S.D.	Satisfaction
Self-assessment process for monitoring and following-up	4.72	0.457	most satisfied
Self-assessment tool for monitoring and following-up	5.00	0.000	most satisfied
Pharmacy development recommendation process by the researcher	4.88	0.336	most satisfied
Follow-up process on pharmacy development by the researcher	5.00	0.000	most satisfied
Overall	4.90	0.154	most satisfied

of community practice or the GPP in all 5 categories of a total of 39 items, it was found that 18 items of GPP criteria that most of them are still less practical can be classified as 2 items in 1st Category, 1 item in 2nd Category, 3 items in 3rd Category, 6 items in 4th Category, and 6 items in 5th Category. Whereas, from the study results was found that the factors affecting the performance, problems, and obstacles in the empowerment and development of pharmacies, the important issues that can be discussed as follows:

The empowerment and development interventions can help pharmacies pass the GPP assessment in the overall category, and the percentage of average scores increased in every category. It is a result of the empowerment and development process using the PDCA quality cycle developed by the researchers, the understanding of GPP knowledge has been revised, and the criteria of the assessment have been more understood to create correct perception and mutual understanding. There is, furthermore, an exchange of experiences and advice on pharmacy development techniques according to criteria. To increase positive attitudes towards GPP compliance, thereby eliminating the feeling of frustration, increasing workload, and becoming amenable to GPP-compliant pharmacies. It is consistent with the qualitative data found that a lack of understanding of the GPP standard is one of the obstacles to pharmacy development. After intervention, the mean GPP scores in all categories after joining had a statistically significant increase in the mean scores. ($p < .001$). There is also a study by Panuchod Thongyang and Komthuan Komwuttikarn (2018) that found that the use of a self-assessment form to monitor the development of pharmacies can contribute to passing the GPP assessment criteria from 8% increased to 88%.¹⁴ According to a study by Pimonwan Onprasert and Pongthep Suteerawut (2016), it was found that support from all sectors will contribute to the development of modern pharmacies to meet the standards.¹⁷

For pharmacies that have to participate in the second development cycle, some issues need to be improved to meet the standards as follows: In the 3rd category, pharmacy workers are required to training on drug legislation or the necessary practical content, the FDA should work with educational institutions to provide training courses and certifications to participants; 4th category. 5th category is the provision of systems related to pharmaceuticals, such as surveillance of adverse reactions and referring patients to the hospital, the pharmacy must provide such systems, even if they never had it before.

In the focus group discussions with licensees, it is understood that pharmacies that meet the GPP criteria will have a quality system in place to provide services and comply with pharmaceutical professional standards. Consistent with the study of Selvaraj, Redzuan, and Hatah (2020), it was found that pharmacists in Malaysia had a positive attitude toward pharmaceutical services by seeing the benefits that people will receive advice from pharmacists.¹⁸ And in line with the study by Hanafi et al. (2013) found that having a positive attitude towards the GPP and pharmaceutical services is more likely to comply with the GPP⁸. Qualitative data obtained from focus group discussions, reflecting issues of budget, increased workload, and lack of public relations that people are unaware of the differences between GPP and non-GPP pharmacies and it does not affect sales value and the number of customers, is a problem and an obstacle to the development of the pharmacy.¹⁹ Therefore, creating a positive attitude towards the GPP by supporting, reducing or eliminating the problems mentioned above will increase collaboration towards GPP compliance. There are also studies by Nattanee Hasitpanichkul and Viroj Jetsadalak (2014) and Pantira Parinyarux and Kitiyot Yotsombut (2022), which found that customer feedback is positive, it will influence on pharmacy because when customers are satisfied with the products and services received from the pharmacy will affect the frequency of service and sales value also increase.²⁰⁻²²

A study by Hanafi et al. (2013) found that knowing the GPP is more likely to comply with GPP.⁸ Thus, educating the licensees in the GPP correctly and periodically highlighting important information, will create continuous awareness leading to correct practice.^{24,25} The need for support regarding GPP compliance as a legal requirement is compulsory to comply. This research, therefore, has a proposal to reduce the problems and obstacles, including financial support, staff training courses, model pharmacies, close consultation, standard form, public relations, the pharmacy club works with the government in supporting its members, and enforcing legal measures. Consistent with the study of Pimonphan Onprasert and Pongthep Suteerawut (2016)¹⁷ was found that the guidelines for pharmacy development should consist of: 1) incentives by supporting privileges, supporting benefits and promoting business interests, partial funding, including supporting services that will facilitate the pharmacy operation; 2) Public relations and awareness raising on the problem of drug use and carry out public relations through public events and media to let people know the difference; 3) Encourage pharmacies to



comply with the law, the restrictive law enforcement, strongly encourages the practice of quality pharmacies, promote pharmacy practices with rewards and at the same time punish those that do not comply with the law.

RECOMMENDATIONS

In this study, interesting issues were found that can be guided and further developed in future research as follows:

Encouraging related government agencies that are directly responsible for supervising the development of standards to implement the PDCA quality cycle, as well as developing and demonstrating the use of self-assessment tools is important. It aims for licensees to participate in the process, and to be monitored. Systematic assessments are created as well. Finally, this is to analyze the cause of the problem and fix it on the spot, which could be causing continuous development and achieving goals.

When this research found that the process of pharmacy promotion using the PDCA quality cycle, various forms of intervention, self-analysis, and pharmacy assessment and monitoring by using the SOAP, can bring good results. This was reflected in the increasing rate of the pharmacy that complies with the GPP and the number of pharmacies that can meet the GPP. Hence, the methods and processes of promotion and development should be applied further in the other types of modern pharmacies to meet the standards. Including being used to enhance the potential of people in other activities or may continue to be implemented in other provinces.

IMPACT OF FINDINGS ON PRACTICE STATEMENTS

The empowering interventions; both group intervention and individual intervention are initiative and effective for GPP compliance of pharmacy licensees in Thailand and they increased the opportunity for GPP achievement.

The application of the SOAP assessment helps to clearly identify the problems and obstacles of each pharmacy licensee which encourages jointly planning to manage with pharmacy licensees and community pharmacists at the right point.

The intervention with PDCA cycle supports pharmacy licensees to improve themselves, meet all GPP standards, and pass quality assessments to ensure drug safety for the public.

AUTHOR CONTRIBUTIONS

Piyanuch Punturungsee: Conceptualization, Formal Analysis,

Methodology, Project Administration, Validation, Writing – Original Draft Preparation, Writing – Review & Editing; Chanuttha Ploylearmsang: Conceptualization, Investigation, Methodology, Validation, Data curation, Writing – Original Draft Preparation, and Final article review and editing.

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INSTITUTIONAL REVIEW BOARD STATEMENT

This study was approved by the Ethics Committee of Mahasarakham University with an approval number of 382-378/2564 and by the Ethics Committee in Human Research from Nakhon Ratchasima Provincial Public Health office, the reference number NRPH 060.

INFORMED CONSENT STATEMENT

Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the participants in focus group discussion.

DATA AVAILABILITY STATEMENT

The data presented in this study is some part of the thesis of the master degree student in the primary care pharmacy program. The thesis is approved by Graduate School, Mahasarakham University.

ACKNOWLEDGMENTS

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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