

ปัจจัยเสริมสร้างการปฏิบัติตามวิธีปฏิบัติทางเภสัชกรรมชุมชน ของร้านขายยาแผนปัจจุบัน จังหวัดฉะเชิงเทรา Factors Enhancing Performance on Good Pharmacy Practice of Modern Drugstores in Chachoengsao Province

นิพนธ์ต้นฉบับ

Original Article

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กลุ่มงานคุ้มครองผู้บริโภคและเภสัชสาธารณสุข สำนักงานสาธารณสุขจังหวัดฉะเชิงเทรา อ.เมืองฉะเชิงเทรา จ.ฉะเชิงเทรา 24000

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วารสารไทยเภสัชศาสตร์และวิทยาการสุขภาพ 2566;18(2):175-182.

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาปัจจัยเสริมสร้างการปฏิบัติตามแนวปฏิบัติที่ดีของเภสัชกรรมชุมชน (good pharmacy practice; GPP) ของร้านยาในจังหวัดฉะเชิงเทรา **วิธีการศึกษา:** การวิจัยเชิงสำรวจรวบรวมข้อมูลจากร้านยา 110 ร้าน จากทั้งหมด 166 ร้านใน จ.ฉะเชิงเทรา โดยการสุ่มตามสะดวก ดำเนินการสำรวจในช่วง 25 มีนาคม ถึง 25 พฤษภาคม 2565 โดยส่งแบบสอบถามประเมินข้อมูลทางประชากรศาสตร์ของร้านและเภสัชกรผู้ตอบคำถาม และแบบประเมินการรับรู้ความสามารถแห่งตนในการปฏิบัติตาม GPP 5 ด้านไปทางไปรษณีย์ ส่วนคะแนนผลการประเมินการปฏิบัติตาม GPP ได้มาจากการประเมินร้านยาในปี 2064 วิเคราะห์ข้อมูลด้วยสถิติ Somer's d และ binary logistic regression **ผลการศึกษา:** จาก 110 ร้าน พบปัจจัยร้านยา 3 ด้าน คือ จำนวนปีที่ขายยา ช่วงที่ขึ้นทะเบียน (ก่อนหรือหลัง 25 มิ.ย. 2557) การอบรมร้านยาตาม GPP และการรับรู้ความสามารถแห่งตนในการปฏิบัติตาม GPP ด้านสถานที่ อุปกรณ์ บุคลากร การควบคุมคุณภาพ และบริการเภสัชกรรมชุมชน (รวม 8 ปัจจัย) สัมพันธ์อย่างมีนัยสำคัญทางสถิติกับการปฏิบัติตาม GPP และทั้ง 8 ปัจจัยทำนายผลการปฏิบัติได้ร้อยละ 71.1 ($R^2 = 0.711$) โดยร้านยาที่รับรู้ความสามารถตนเองด้านอุปกรณ์ในระดับสูงมีโอกาสมิผลการปฏิบัติสูงเป็น 14.4 เท่าของร้านที่รับรู้ต่ำ (adj. OR = 14.36) ร้านที่ขึ้นทะเบียนหลัง 25 มิ.ย. 2557 มีโอกาสเป็น 7.5 เท่าของร้านที่ขึ้นทะเบียนก่อน 25 มิ.ย. 2557 (adj. OR = 7.53) และร้านที่เคยเข้าอบรม GPP มีโอกาสเป็น 6.2 เท่าของร้านที่ไม่เคย (adj. OR = 6.24) สรุป: ร้านยาที่รับรู้ความสามารถตนเองด้านอุปกรณ์ในระดับสูง ที่ขึ้นทะเบียนหลัง 25 มิ.ย. 2557 และเคยเข้าอบรม GPP สัมพันธ์กับการมีผลการปฏิบัติตาม GPP ในระดับสูง ควรเน้นให้ร้านที่ขึ้นทะเบียนก่อน 25 มิ.ย. 2557 และไม่เคยเข้ารับการอบรมได้เข้ารับการอบรม

คำสำคัญ: ร้านขายยาแผนปัจจุบัน, ร้านยาชุมชน, วิธีปฏิบัติทางเภสัชกรรมชุมชน, ปัจจัยเสริมสร้าง

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Abstract

Objective: To determine enhancing factors of performance on good pharmacy practice (GPP) of modern drugstores in Chachoengsao, Thailand.

Method: In this survey study, 110 out of 166 drugstores in Chachoengsao participated through convenience sampling with mailed questionnaire from March 25 to May 25, 2022. The mailed questionnaire asked for demographic characteristics of drugstores and practicing pharmacists and perceived self-efficacy to 5 aspects of GPP. Scores of performances on GPP were from the 2021 annual assessment on drugstores 2021. Data were analyzed using Somer's d and binary logistic regression. **Results:** Of these 110 drugstores, 3 drugstore factors (i.e., number of years in operation, duration of getting the license [before or after June 25, 2014], and history of attending the GPP training) and 5 aspects of perceived self-efficacy on GPP (i.e., place, devices, personnel, quality control, and community pharmacy service) were significantly associated with performance on GPP. These 8 factors predicted 71.1% of the performance ($R^2 = 0.711$). Drugstores with high-level device-related perceived self-efficacy, license after June 25, 2014, and a history of attending GPP training were 14.4, 7.5, and 6.2 times of having high GPP performance when compared with their counterparts, respectively (adj. OR = 14.36, 7.53, and 6.24, respectively). **Conclusion:** Drugstores with high-level device-related perceived self-efficacy, license after June 25, 2014, and a history of attending GPP training were more likely to have high GPP performance. Drugstores with license before June 25, 2014, and no GPP training should be encouraged to attend GPP training.

Keywords: modern drugstore, community pharmacy, Good Pharmacy Practice, enhancement factors.

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Introduction

Good Pharmacy Practice (GPP) is the practice that serves the needs of the people for pharmacists' optimal, evidence-based care.¹ In 1992, the International Pharmaceutical Federation (FIP) developed standards for pharmacy service entitled "Good pharmacy practice in community and hospital pharmacy settings" which was adopted by the World Health

Organization in 1994. In 2007 the "Bangkok declaration on good pharmacy practice in the community pharmacy settings" in the South-East Asia Region was adopted by the International Pharmaceutical Federation (FIP) South-East Asia Pharmaceutical Forum.²

Regarding the GPP in Thailand, the development of standards for pharmaceutical and health services of the country was initiated by the Pharmacy Council of Thailand. The Pharmacy Council regulations regarding quality certification of drugstore practice, B.E. 2546 (A.D. 2003) was set in order to elevate the standards of community pharmacy service voluntarily in the drugstore which was known as "Accredited Drugstore."³ In order to provide the best care to the drugstore consumers under the pharmacy professional standards, the Good Pharmacy Practice was declared in the Ministry of Public Health Announcement and the Ministerial Regulations B.E. 2556 (A.D. 2013) regarding the issuance of licenses to sale modern medicines.⁴ The regulations have been enforced since June 25, 2014. For drugstores receiving license before the enforcing date, a waiver was granted for a period of 8 years. Therefore, each modern drugstore must pass the GPP requirements before getting or renewing the license.^{5,6,7} Under the ministerial regulations, the GPP was divided into 2 sections namely places and equipment section and community pharmacy practice section. The two sections were then divided into 5 categories with 40 items or criteria for assessment, specifically place (10 items), equipment (6 items), personnel (5 items), drug quality control (7 items), and pharmacy service (12 items).⁸

Chachoengsao province had 166 licensed modern drugstores in 2022. They consisted of 97 drugstores licensed before 25 June 2014 and 69 licensed after 25 June 2014. The drugstores were distributed in all 11 districts of the province. All drugstores must be developed to meet the mandatory GPP regulations before June 24, 2022, to be eligible to apply for license renewal in December 2022. Based on the results of the GPP assessment for license renewal in 2021, problems in understanding and practicing according to the GPP assessment items were found.⁹ For example, there was no curtain to cover the dangerous drug area when the pharmacist was not on duty; drugs were not classified according to pharmacological groups; there was no fire extinguisher or there was one with under standard; roles of pharmacist and assistant pharmacist were unclearly specified; drugstore employees did not get up-to-date training; pet was found in the store; there was a lack of expired drug monitoring system; there was incomplete information on drug packets; drug purchase account was not completed or updated; and drug advertisement materials were found with no authorization or with expired date.⁹

In enhancing a person to perform a specific behavior, important factors that affect the behavioral practices must be taken into account especially predisposing, enabling, and reinforcing factors.¹⁰ These three factors were classified into intrapersonal factors and external factors.¹¹ Intrapersonal factors are those reflected from the person's cognition such as knowledge, attitude, value, and perception. Based on self-efficacy theory, a person's chance in performing a given behavior depends largely on perceived self-efficacy (predisposing), and the consequences of the behavior will in turn enhance the self-efficacy. Bandura believed that perceived self-efficacy is an intrapersonal or predisposing factor that is important to a person's behavior.¹² Therefore, perceived self-efficacy might be one of the key success factors in preparing the drugstore to pass the GPP criteria. Most of the GPP-related research primarily were survey that aimed to identify problems, attitudes, practice assessments, and awareness from customers' perspectives.¹³⁻¹⁶ Even though there were few studies on factors related to the GPP practice, the perceived self-efficacy to develop drugstores according to the GPP criteria was not included in these studies. Furthermore, only bivariate analysis was primarily used to assess the association between self-efficacy and GPP practice.¹⁷

In this present study, we aimed to examine the associations between performance of the drugstore according to GPP criteria and perceived self-efficacy, and characteristics of the drugstores including number of years in store operation, the time of being licensed, number of working years of the informant pharmacist, number of pharmacists working in the store, and history of attendance of the GPP training organized by the Consumer Protection and Public Health Pharmacy Division, Chachoengsao Provincial Public Health Office. The associations between the performance on GPP with each of these independent factors with could be useful for any future measures or strategies to enhance performance of the drugstore to meet more of the GPP criteria.

Methods

In this cross-sectional survey research, study population was 166 modern drugstores licensed in 2022 with the Consumer Protection and Public Health Pharmacy Department, Chachoengsao Provincial Public Health Office. The study sample was 113 modern drugstores selected by

convenience sampling from the study population. Adam's table, which was modified from Yamane's (1967) formula, was used to determine the sample size for categorical data. With 95% confidence, a margin error of 0.05, and a population size of 166, a total of 113 participants were needed.¹⁸ The sample size proportional to the sub-population size was determined, i.e., at least 66 and 48 out of the 96 and 70 drugstores licensed before and after June 25, 2014, were required. Since a high return rate could not be expected, we approached all study population drugstores by mail.

Research instrument

A self-administered questionnaire was used to collect data from a pharmacist who was in charge of the drugstore. The questionnaire consisted of two parts. Part I included 5 closed responses questions about drugstore namely, number of years in store operation, time of the first launch (before or after June 25, 2014), number of working years of the informant pharmacist, number of pharmacists working in the store, and history of attendance of the GPP training of the informant pharmacist. This GPP training was the one organized by the Consumer Protection and Public Health Pharmacy Division, Chachoengsao Provincial Public Health Office.

Part II was a set of questions assessing perceived self-efficacy to perform 40 activities required by the GPP to renew the drugstore license. These 40 required activities were categorized into 5 groups including places (10 items), equipment (6 items), personnel (5 items), drug quality control (7 items), and pharmacy service (12 items).^{5,7,8} The question asked how much the participant was certain to perform each activity. The response was a 5-point rating scale ranging from 1-not at all, to 2-hardly, 3-moderately, 4-highly, and 5-totally. Since the obtained scores were skewed to the maximum, the norm reference was used to categorize the scores into three levels of self-efficacy. Based on the mean with standard deviation (SD), three levels of self-efficacy were low, moderate and high with scores of less than mean minus 1SD, scores of the mean minus 1SD to the mean, and scores greater than the mean, respectively. The original scores were transformed into a better normally distributed for further inferential statistical analysis.¹⁹

For **quality assurance**, the questionnaire on self-efficacy was assessed for content validity by three pharmacists experienced in GPP requirements. These three pharmacists worked in the Consumer Protection and Public Health

Pharmacy Division of three provinces in Health Region 6. Each question was found to have acceptable content validity with the Item-Objective Congruence Index (IOC) of greater than 0.5. Thirty drugstores not included in the study sample were used to test reliability for self-efficacy questions. The questions had high internal consistency reliability with a Cronbach's alpha coefficient of 0.83.²⁰

Performance of the drugstore according to GPP criteria

The outcome variable measure which was the performance of the drugstore according to the GPP criteria was derived from the annual assessment scores on the drugstore by the Consumer Protection and Public Health Pharmacy Division, Chachoengsao Provincial Public Health Office. The 2021 scores on GPP were retrieved from the department's database.

All drugstores had very high performance scores in 2021. All drugstores pass the 70% cut-off. The minimum score was 94.00%. The mean with standard deviation of performance scores was used to categorize the scores into three groups of performance. Based on the mean with standard deviation (SD), three levels of performance on GPP were low, moderate and high with scores of less than mean minus 1SD, scores of the mean minus 1SD to the mean, and scores greater than the mean, respectively.

In addition, the scores of performances were also categorized into two groups namely (1) those with scores lower than the mean (below-the-mean performance group) and (2) those with scores at the mean or higher (mean-and-above performance group), in order to fit the binary logistic regression analysis.

Ethical considerations

The study protocol was approved by the Human Research Ethics Committee of Chachoengsao province (Approval number: PH_CCO_REC010/2565; approval date: March 23rd, 2022).

Data collection procedure

After the study protocol was approved by the Human Research Ethics Committee, a self-administered questionnaire along with participant information sheet, informed consent form, and two envelopes were mailed to all licensed drugstores. Details of the study's objectives, procedure, benefits, and voluntary participation were included in the envelope.

Practicing pharmacists were asked to complete the questionnaire. For drugstores where the owners were practicing pharmacist, the owners were asked to complete the questionnaire. The participants were instructed to put the completed questionnaire and informed consent into separate envelopes and mail the two sealed envelopes to the researcher. The mailing survey started from March 25 through May 25, 2022. A telephone call reminder was placed to any drugstores not returning the survey within one month. Data entry and wild code check were done before data analysis.

Data analysis

Descriptive statistics including frequency with percentage and mean with standard deviation were used to summarize characteristics of the drugstores, performance of the drugstore and level of participant's perceived self-efficacy. The associations between performance on GPP (3 levels) and each of all characteristics (i.e., number of years in store operation, time of getting a license, number of working years of the informant pharmacist, number of pharmacists working in the store, and history of attendance of the GPP training) and each of all aspects of perceived self-efficacy (i.e., place, equipment, personnel, drug quality control, and pharmacy service) were tested by Somer's d which was an asymmetric association statistic for an ordinal dependent variable and an ordinal independent variable.²¹ Any of these independent variables with significant associations with performance on GPP were eligible for the binary logistic regression analysis to further test their associations with the performance on GPP (below-the-mean or standard level vs. mean-and-above or high level). Associations from binary logistic regression were presented as adjusted odds ratio (adj. OR) with 95% confidence interval (95% CI). Statistical significance was set at a type I error of 5% (or *P*-value < 0.05). All statistical analyses were performed using software program SPSS version 20.0.

Results

Of the 113 informants required, a total of 110 survey questionnaires were returned. According to the characteristic of the drugstores, majority of them had been licensed for over 10 years (40.0%) while 28.2% and 31.8% had been licensed for 5 to 10 and less than 5 years, respectively. More than half (58.2%) of the drugstores were licensed before June 25, 2014.

About one-third of the pharmacists had been working in the participating stores 5 to 10 years (33.7%) and over 15 years (31.8%). Most of the drugstores (88.2%) had only one pharmacist, while the rest had two pharmacists working in the store (11.8%). Nearly half (44.5%) of the informants never attended the GPP training organized by the Consumer Protection and Public Health Pharmacy Department of the Chachoengsao Provincial Public Health Office (Table 1).

Table 1 Characteristics of the participating drugstores and pharmacists (N = 110).

Characteristics	N	%
Number of years in operation		
< 5	35	31.8
5 - 10	31	28.2
> 10	44	40.0
Time of getting the license		
Before 25 June, 2014	64	58.2
June 25, 2014, onwards	46	41.8
Number of working years of the informant pharmacist		
< 5	15	13.6
5 -10	37	33.7
11 - 15	23	20.9
> 15	35	31.8
Number of working pharmacists		
1	97	88.2
2	13	11.8
History of attending the GPP training of the informant pharmacist		
Yes	61	55.5
No	49	44.5

In relation to perceived self-efficacy to perform the GPP of the informant pharmacists, it was found that mean scores of the 5 regulation categories were close to the possible maximum score (i.e., score of 100%). When the obtained scores were divided into low, moderate, and high levels, half of the informant pharmacists were classified in the high self-efficacy level on place (50.0%), equipment (59.1%), and drug quality control (55.4%). While 40.9% and 42.8% of them were in the high level of personnel and pharmacy service, respectively. The mean score of the performance on GPP was also skewed to the total score. When the obtained scores were divided into low, moderate, and high levels, 54.5% of the drugstores were classified as a high level (Table 2).

Bivariate analyses on performance on GPP with each of the independent variables using Somer's d statistic revealed that 8 out of 10 independent variables were significantly related to the level of performance on GPP (*P*-value < 0.05) (Table 3). These 8 variables were number of years in operation, time of getting the license, history of attending the GPP training of the informant pharmacist, and perceived self-

efficacy to perform GPP on its five aspects namely place, equipment, personnel, drug quality control, and pharmacy service.

The eight significant association factors were eligible for the binary logistic regression analysis. According to the Somer's d value, without taking into account all other variables, the perceived self-efficacy on equipment was the best predictor of the performance on GPP (67.3% correctly predicted, Somer's d value = 0.673). Since the Somer's d value was positive, informant pharmacists with a high level of perceived self-efficacy on equipment tended to be in the high level of performance on GPP (81.5%). Only 22.2% of pharmacists with the low level of perception on equipment were with the high level of the performance. The following three important predictors were history of attending the GPP training of the informant pharmacist, perceived self-efficacy on place, and number of years in operation (Somer's d = 0.535, 0.435 and 0.307, respectively) (Table 3).

Table 2 Levels of perceived self-efficacy and performance on GPP of the informant pharmacists (N = 110).

Level of performance and self-efficacy	N	%
1. Levels of perceived self-efficacy*	n	%
Perception on place. (total score = 40)		
Low	20	18.2
Moderate	35	31.8
High	55	50.0
Min. = 25.0, Max. = 40.0, Mean = 37.97, SD= 2.27		
Perception on equipment (total score = 25)		
Low	18	16.4
Moderate	27	24.5
High	65	59.1
Min. = 11.0, Max. = 25.0, Mean = 23.86, SD = 2.04		
Perception on personnel (total scores = 20)		
Low	32	29.1
Moderate	33	30.0
High	45	40.9
Min. = 12.0, Max. = 20.0, Mean = 18.21, SD = 2.21		
Perception on drug quality control (total score = 35)		
Low	21	19.1
Moderate	28	25.5
High	61	55.4
Min. = 14.0, Max. = 35.0, Mean = 32.63, SD= 3.28		
Perception on pharmacy service (total score = 50)		
Low	25	22.7
Moderate	38	34.5
High	47	42.8
Min. = 32.0, Max. = 50.0, Mean = 45.72, SD= 3.64		
2. Level of performance on GPP* (total score = 100%)		
Low	20	18.2
Moderate	30	27.3
High	60	54.5
Min. = 94.0, Max. = 99.1, Mean = 98.13, SD = 1.29		

* Since the obtained scores were skewed to the maximum, the mean with standard deviation was used to categorize the obtained scores into three groups as low, moderate and high with scores of less than mean minus 1SD, scores of the mean minus 1SD to the mean, and scores greater than the mean, respectively.

Table 3 Associations between performance on GOP and characteristics of the drugstores and perceived self-efficacy on GPP (N = 110).

Variables	Level of performance on GPP			Test value ^a	P-value
	Low (n, %)	Moderate (n, %)	High (n, %)		
Number of years in operation				0.307	< 0.001*
< 5	2 (5.7)	5 (14.3)	28 (80.0)		
5 - 10	5 (16.1)	11 (35.5)	15 (48.4)		
> 10	13 (29.5)	14 (31.8)	17 (38.7)		
Time of getting the license				0.299	0.002*
Before 25 June, 2014	15 (23.4)	22 (34.4)	27 (42.2)		
June 25, 2014, onwards	5 (10.9)	8 (17.4)	33 (71.7)		
Number of working years of the informant pharmacist				0.074	0.346
< 5	3 (20.0)	4 (26.7)	8 (53.3)		
5 - 10	5 (13.5)	10 (27.0)	22 (59.5)		
11 - 15	3 (13.0)	6 (26.1)	14 (60.9)		
> 15	9 (25.7)	10 (28.6)	16 (45.7)		
Number of working pharmacists				0.008	0.958
1	18 (18.6)	26 (26.8)	53 (54.6)		
2	2 (15.4)	4 (30.8)	7 (53.8)		
History of attending the GPP training of the informant pharmacist				0.535	< 0.001*
Yes	2 (3.3)	13 (21.3)	46 (75.4)		
No	18 (36.7)	17 (34.7)	14 (28.6)		
Perceived self-efficacy					
Perception on place				0.435	< 0.001*
Low	10 (50.0)	4 (20.0)	6 (30.0)		
Moderate	10 (28.6)	12 (34.3)	13 (37.1)		
High	0 (0.0)	14 (25.5)	41 (74.5)		
Perception on equipment				0.673	< 0.001*
Low	13 (72.2)	1 (5.6)	4 (22.2)		
Moderate	6 (22.2)	18 (66.7)	3 (11.1)		
High	1 (1.5)	11 (16.9)	53 (81.5)		
Perception on personnel				0.168	0.032*
Low	9 (28.1)	6 (18.8)	17 (53.1)		
Moderate	10 (30.3)	9 (27.3)	14 (42.4)		
High	1 (2.2)	15 (33.3)	29 (64.5)		
Perception on drug quality control				0.182	0.032*
Low	4 (19.0)	5 (23.8)	12 (57.2)		
Moderate	11 (39.3)	8 (28.6)	9 (32.1)		
High	5 (8.2)	17 (27.9)	39 (63.9)		
Perception on pharmacy service				0.292	< 0.001*
Low	4 (16.0)	10 (40.0)	11 (44.0)		
Moderate	16 (42.1)	9 (23.7)	13 (34.2)		
High	0 (0.0)	11 (23.4)	36 (76.6)		

* P-value < 0.05, ^a Somer's d value (performance on GPP was the dependent variable)

Binary logistic regression revealed that 8 independent variables together were significantly associated with performance levels ($\chi^2 = 82.965$, P -value < 0.001). The model explained 71.1% of the performance GPP variation (Nagelkerke $R^2 = 0.711$). When all factors in the analysis model were taken into account, only three factors that significantly contributed to the model namely having high level of perceived self-efficacy on equipment (P -value = 0.042), time of getting the license (P -value = 0.030), and history of attending the GPP training of the informant pharmacist organized (P -value = 0.015). The drugstores with a high level of self-efficacy in maintaining the equipment were 14.4 times more likely to have a high level of performance on GPP

compared with those at a low level (adj. OR = 14.369). The stores that got licensed since June 25, 2014, were 7.5 times more likely to have a high level of performance on GPP compared with those licensed before June 25, 2014 (adj. OR = 7.535). Finally, drugstores where pharmacists had a history of GPP training were 6.2 times more likely to have a high level of performance on GPP compared with those with no history (adj. OR = 6.244) (Table 4).

Table 4 Factors affecting GPP performance levels (N = 110).

Factors	n	B	S.E.	P-value	adj. OR ⁵	95% CI
Number of years in operation						
< 5	35	0.126	0.846	0.882	1.134	0.216 – 32.982
5 - 10	31	1.473	1.032	0.154	4.361	0.577 – 5.956
> 10	44				1.00	
Time of getting the license						
Before 25 June, 2014	64				1.00	
June 25, 2014, onwards	46	2.020	0.928	0.030*	7.535	1.221 – 46.483
History of attending the GPP training of the informant pharmacist						
Yes	61	1.832	0.755	0.015*	6.244	1.421 – 27.432
No	49				1.00	
Perceive self-efficacy						
Perception on place						
Low	20				1.00	
Moderate	35	-0.930	1.178	0.430	0.394	0.039 – 3.966
High	55	0.505	1.194	0.672	1.657	0.160 – 17.199
Perception on equipment						
Low	18				1.00	
Moderate	27	-0.609	1.246	0.625	0.544	0.047 – 6.258
High	65	2.665	1.314	0.042*	14.369	1.095 – 188.626
Perception on personnel						
Low	32				1.00	
Moderate	33	-1.374	0.994	0.167	0.253	0.036 – 1.776
High	45	-0.144	0.860	0.867	0.866	0.160 – 4.670
Perception on drug quality control						
Low	21				1.00	
Moderate	28	-1.089	1.054	0.301	0.336	0.043 – 2.656
High	61	-1.969	1.127	0.081	0.140	0.015 – 1.272
Perception on pharmacy service						
Low	25				1.00	
Moderate	38	0.385	0.914	0.674	1.469	0.245 – 8.805
High	47	1.308	1.038	0.208	3.699	0.484 – 28.291
Constant		-2.112	1.082	0.051	0.121	

* P-value < 0.05; Model test: $\chi^2 = 82.965$, P-value < 0.001, Nagelkerke $R^2 = 0.711$.

Predicted performance on GPP groups = 83.6% corrected (high level (scores less than mean): observed = 47, predicted = 38; high level (scores equal mean and higher): observed = 63, predicted = 54).

⁵ Adj. OR = the odds ratio of having high level of performance on GPP (scores equal mean and higher) in respondents with moderate or high level compared with those at the low level of each factor.

Discussions and Conclusion

This survey study revealed that three factors of the drugstore (number of years in operation, time getting license, and history of attending the GPP training) and five aspects of perceived self-efficacy to perform the GPP including place, equipment, personnel, drug quality control, and pharmacy service were together significantly associated with the performance on GPP of the modern drugstores in Chachoengsao province. These 8 factors affected as high as 71.1% of the variance of performance on GPP.

Among these 8 factors, only 3 were significantly associated with the performance on GPP. Drugstores with a high level of self-efficacy in maintaining the equipment were 14.4 times more likely to have a high level of performance on GPP compared with those at a low level. Drugstores where pharmacists had a history of GPP training were 6.2 times more likely to have a high level of performance on GPP compared with those with no history. The stores that got licensed since June 25, 2014, were 7.5 times more likely to have a high level of performance on GPP compared with those licensed before June 25, 2014.

Consistency of the results between bivariate (Somer's d) and multivariate (logistic regression) statistical analysis strongly confirmed the conclusions. When all other factors were not taken into account, the most important factor to predict the performance on GPP was the perceived self-efficacy on equipment (Somer'd = 0.673). This was followed by a history of attending the GPP training, number of years in operation, and time of getting the license (Somer'd = 0.535, 0.307, and 0.299 respectively). When other 7 factors in the logistic regression analysis model were taken into account, rank order of the important factors to predict the performance were the same as bivariate analysis results.

It was interesting to point out that more than half of the drugstores gained the performance on GPP higher than 98.13% of the total score (54.5% of those with high performance level had the scores higher than mean, Table 2). This could be supported by self-efficacy theory. In renewing drugstore license, a drugstore was enforced to perform GPP self-assessment. By doing the assessment, self-efficacy to perform the GPP was developed, and the efficacy was further strengthened when the renewal license was accomplished. According to Bandura²², perceived self-efficacy and success of outcome expectation determine whether a person will engage in particular behavior. These two things are reciprocally reinforced. Thus, the quite high score of perceived self-efficacy to perform GPP and the performance on GPP were the accumulated products from renewal of license each year. The process of GPP self-assessment each year that enhanced self-efficacy was confirmed by the study of Clark, Gong and Kaciroti¹¹ and Imamee²³ about chronic disease self-management cycle. The cycle starts with problem analysis, planning, acting according to the plan, and evaluation, and then moving to the problem analysis of the next cycle.

Regarding factors related to the GPP practices, Sombatpothon and Polnok¹⁷ found positive significant association between supporting and motivating factors of Herzberg's two-factor theory and GPP score level. Most of the related GPP studies were descriptive type and did not include variables on perceived self-efficacy to perform GPP. Furthermore, only bivariate analysis was primarily used to assess the association between two factors.

This study has certain limitations. There are many factors that might affect individual practices. This study mainly aimed to assess the effect of self-efficacy, which was only one predisposing or intrapersonal factor, on GPP performance. Effects of other psychosocial factors should be examined. The performance on GPP in 2021 was assessed on-line, not on-site due to an outbreak of Covid-19. Thus, the assessment scores might be higher than the usual assessment. This study might suffer from social desirability bias. The study used convenience sampling method which could draw a large portion of those who were at a high level of performance on GPP and self-efficacy. Studies with random sampling might represent the population better.

Findings from the study could be useful in practice and policy making. The Consumer Protection and Public Health Pharmacy Department of the Chachoengsao Provincial Public Health Office should offer the GPP training for the drugstores that never attended the training. Since 44.5% of the stores still did not get the training and 53.5% of the drugstores with high performance on GPP could be correctly predicted by the history of attending the training (when not taking into account other factors). Also, drugstores that their pharmacists participated in the training were 6.2 times more likely to be at a high GPP performance level than the those never attending the training.

Drugstores that had been in operation for more than 5 years (or those opened before June 2014) should be identified as a primary group for training. This is because drugstores opened for less than 5 years (or after June 2014) had high performance GPP scores. They also had a higher score than drugstores that had been open for more than 5 years (i.e., having been open before June 2014). The latter group of drugstores had been granted GPP development waiver until December 2022.

Drugstores that successfully achieved the implementation of the mandatory GPP regulations should be used as a positive modelling for training. Witnessing other people

successfully completing a task is another important source of self-efficacy. According to Bandura, "seeing people similar to oneself succeed by sustained effort raises observers' beliefs that they too possess the capabilities to master comparable activities to succeed."²⁴

Drugstores should do self-assessment in relation to the GPP development and begin to develop from easy to difficult tasks. Success in developing the easy categories (mastery experience) will enhance self-efficacy to perform the next difficult categories. The most effective way of developing a strong sense of efficacy is through mastery experiences. Performing a task successfully strengthens sense of self-efficacy.²⁴

For future studies, other factors such as other characteristics of the drugstore and other psychosocial factors should be considered. The following factors might be worth exploring. For example, size of the drugstore, support by the Consumer Protection and Public Health Pharmacy Department (enabling factor) and monitoring progress on GPP development (reinforcing factor). In addition, quasi-experimental research using networking zone of drugstores should be conducted to assess the effectiveness of social support among the drugstores in its zone along with the efficacy in using highly successful drugstores on GPP as positive model.

In conclusion, of the 110 drugstores in Chachoengsao province participating in our study, 3 drugstore factors (i.e., number of years in operation, duration of getting the license [before or after June 25, 2014], and history of attending the GPP training) and 5 aspects of perceived self-efficacy on GPP (i.e., place, devices, personnel, quality control, and community pharmacy service) were significantly associated with performance on GPP. These 8 factors predicted 71.1% of the performance ($R^2 = 0.711$). Drugstores with high-level device-related perceived self-efficacy, license after June 25, 2014, and a history of attending GPP training were 14.4, 7.5, and 6.2 times of having high GPP performance when compared with their counterparts, respectively (adj. OR = 14.36, 7.53, and 6.24, respectively). Drugstores with high-level device-related perceived self-efficacy, license after June 25, 2014, and a history of attending GPP training were more likely to have high GPP performance. Drugstores with license before June 25, 2014 and no GPP training should be encouraged to attend GPP training.

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