Journal of Public Health and Development
Vol. 17 No. 1 January-April 2019

ORIGINAL ARTICLE

Factors influencing the performance of village health posts in Kalasin Province, Thailand

Bunpode Suwannachat[1, 2], Jiraporn Chompikul[3], Aroonsri Mongkolchati[3] and Boonyong Keiwkarnka[4]

[1] *M.P.H.M., ASEAN Institute for Health Development, Mahidol University, Thailand*
[2] *M.D., Kalasin Hospital, Thailand*
[3] *Ph.D., ASEAN Institute for Health Development, Mahidol University, Thailand*
[4] *Dr.P.H., ASEAN Institute for Health Development, Mahidol University, Thailand*

Corresponding author: *Jiraporn Chompikul* ***E-mail:*** *jiraporn.chm@mahidol.edu*
Received: *10 January 2019* ***Revised:*** *26 March 2019* ***Accepted:*** *5 April 2019*
Available online: *April 2019*

Abstract

Suwannachat B, Chompikul J, Mongkolchati A, and Keiwkarnka B. Factors influencing the performance of village health posts in Kalasin Province, Thailand. J Pub Health Dev. 2019;17(1):75-86

A descriptive study was conducted to identify factors influencing the performance of village health posts (VHPs) at Kalasin province, Thailand. Stratified sampling was used to randomly select a sample of 92 VHPs which responded to the structured questionnaires. Chi-square tests and multiple logistic regression were used to examine associations between independent variables and the performance of VHPs.

The response rate was 74.2%. Thirty-five VHPs (38 %) were categorized into the high level of the performance and 57 VHPs (62 %) into the low level of the performance using the mean activities (3.58 visits per day) done by each VHP as the cut-off point. In the Chi-square tests, community health group, community health fund, distance from a VHP to a health center more than 3 kilometers, financial support for village health volunteers and participation of community leaders in VHP execution were found to be significant association with the performance of VHPs (p-value < 0.05). Multiple logistic regression revealing significant predictors for the performance of VHPs composed of financial support for village health volunteers and participation of community leaders in VHP execution. When controlling other factors, VHPs with financial support for health volunteers were 5.9 times more likely to have the high level of the performance than those with no financial support. VHPs with high level of community leader participation in execution of VHPs was 10.2 times more likely to have the high level of the performance than those with the low level of participation.

The findings of this study suggest that providing of financial support for village health volunteers and promotion of community leader participation in VHP execution can boost the performance of VHPs.

Keywords: village health posts, performance, village health volunteers

วารสารสาธารณสุขและการพัฒนา
ปีที่ 17 ฉบับที่ 1 มกราคม-เมษายน 2562

ปัจจัยที่มีอิทธิพลต่อผลการดำเนินงานสุขศาลาในจังหวัดกาฬสินธุ์ ประเทศไทย

บรรพจน์ สุวรรณชาติ[1, 2] จิราพร ชมพิกุล[3] อรุณศรี มงคลชาติ[3] และ บุญยง เกี่ยวการค้า[4]

[1] *M.P.H.M. สถาบันพัฒนาสุขภาพอาเซียน มหาวิทยาลัยมหิดล ประเทศไทย*
[2] *M.D. โรงพยาบาลกาฬสินธุ์ ประเทศไทย*
[3] *Ph.D. สถาบันพัฒนาสุขภาพอาเซียน มหาวิทยาลัยมหิดล ประเทศไทย*
[4] *Dr.P.H. สถาบันพัฒนาสุขภาพอาเซียน มหาวิทยาลัยมหิดล ประเทศไทย*

บทคัดย่อ

บรรพจน์ สุวรรณชาติ จิราพร ชมพิกุล อรุณศรี มงคลชาติ และบุญยง เกี่ยวการค้า ปัจจัยที่มีอิทธิพลต่อผลการดำเนินงานสุขศาลาในจังหวัดกาฬสินธุ์ ประเทศไทย ว. สาธารณสุขและการพัฒนา 2562;17(1):75-86

การศึกษาแบบพรรณนานี้ทำเพื่อหาปัจจัยที่มีอิทธิพลต่อผลการดำเนินงานของสุขศาลาในจังหวัดกาฬสินธุ์ โดยสุ่มตัวอย่างแบบชั้นภูมิ ได้สุขศาลา 92 แห่งที่ตอบแบบสอบถาม ทำการวิเคราะห์ ข้อมูลโดยใช้การทดสอบไคสแควร์และการถดถอยลอจิสติกพหุคูณ

อัตราการตอบกลับแบบสอบถามเป็น 74.2% การศึกษาพบว่าการให้บริการเฉลี่ยต่อวันของสุขศาลาเท่ากับ 3.58 ครั้ง สุขศาลา 35 แห่ง (38%) จัดเป็นสุขศาลาที่มีผลการดำเนินงานสูง 57 แห่ง (62 %) ถูกจัดให้เป็นสุขศาลาที่มีผลการดำเนินต่ำโดยใช้ค่าเฉลี่ยการให้บริการเป็นเกณฑ์ ผลการทดสอบไคสแควร์พบว่า การมีกลุ่มหรือชมรมด้านสุขภาพในชุมชน การได้รับงบประมาณสนับสนุนโครงการสุขภาพ ระยะทางจากสุขศาลาไปโรงพยาบาลส่งเสริมสุขภาพตำบลมากกว่า3 กิโลเมตร การได้รับค่าตอบแทนสนับสนุนการทำงานของอาสาสมัครสาธารณสุขและการมีส่วนร่วมของผู้นำชุมชนในการดำเนินงานของสุขศาลามีความสัมพันธ์อย่างมีนัยสำคัญกับผลการดำเนินงานของสุขศาลา ผลจากการวิเคราะห์ถดถอยลอจิสติกปัจจัยที่สามารถทำนายผลการดำเนินงานของสุขศาลาประกอบด้วยการได้รับค่าตอบแทนสนับสนุนการทำงานของอาสาสมัครสาธารณสุขและการมีส่วนร่วมของผู้นำชุมชนในการดำเนินงานของสุขศาลา โดยสุขศาลาที่ได้รับค่าตอบแทนในการดำเนินงานของอาสาสมัครสาธารณสุขมีโอกาส 5.9 เท่า ที่จะมีผลการดำเนินสูงเมื่อเทียบกับกลุ่มที่ไม่ได้รับการสนับสนุน และสุขศาลาที่ผู้นำชุมชนมีส่วนร่วมในการดำเนินงานมากมีโอกาส 10.2 เท่าที่จะมีผลการดำเนินงานสูงเมื่อเทียบกับกลุ่มที่มีส่วนร่วมน้อย

การศึกษานี้ชี้ให้เห็นว่าควรสนับสนุนค่าตอบแทนแก่อาสาสมัครสาธารณสุขในการทำงานในสุขศาลาและการมีส่วนร่วมของผู้นำชุมชนในการดำเนินงานของสุขศาลา ซึ่งจะช่วยส่งเสริมผลการดำเนินงานของสุขศาลาที่จังหวัดกาฬสินธุ์ได้

คำสำคัญ: สุขศาลา ผลการดำเนินงาน อาสาสมัครสาธารณสุขประจำหมู่บ้าน

Introduction

In order to achieve the better performance of health systems, Primary Health Care (PHC) was implemented in Thailand. Primary Health Care according to the Alma-Ata Declaration is an essential care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process[1-3].

Implementation of comprehensive care as advocated by the Alma-Ata Declaration is essential in PHC. However, in practice, outcome of this strategy, is not easy to achieve. There are two main reasons: 1) role of physicians in many countries, training for medical doctors is focused on medical sciences and technologies. As a result, their competence, attitude and behavior are not toward public health. So their focus in delivering care is biased towards medical care and 2) limited resources for health, particularly in human and financial resources[1]. Other factors included insufficient political prioritization of health, structural adjustment policies, poor governance, population growth, inadequate health systems, and scarce research and assessment on primary health care[4]. Lessons learned from Alma Ata Declaration all countries need nationally agreed package of prioritized and phased primary health care that all stakeholders are committed to implement, pay attention to district management systems, and consistent investment in primary health-care extension workers linked to the health system[5].

In Thailand over the past two decades the government has adopted an incremental approach to extend health-care coverage to the population. In October 2001, the government decided to embark on a programme to provide universal health-care coverage[2]. The emphasis on primary care in the Universal Coverage scheme represented a bold departure from the traditional, hospital-dominated Thai healthcare system[3]. Initial problems with this new scheme included a shortage of doctors to staff of primary care units, necessitating the use of hospital doctors who rotated out to the clinics. The doctors were too few in number and they lacked of both the skills and introduction to the integration of prevention and health promotion with medical care. Nurses and health workers serve as the backbone of service delivery at primary care level[3]. The use of community health workers (CHWs), which is known as village health volunteer (VHV) in Thailand, has been identified as one strategy to overcome the shortage problem of health workers, particularly in low-income countries, to render certain basic health services[4]. There is robust evidence that CHWs can undertake actions that lead to improve health outcomes, especially, but not exclusively, in the field of child health[4]. CHWs can also make a valuable contribution to community development and, more specifically, can improve access to and coverage of communities with basic health services. They are

the backbone of the health care delivery system, supporting the concept of community involvement as the heart and soul of PHC activities[5-6].

The CHW is part of both the formal health service and the social setting of the health system, providing a bridge between the community and the country's organized health system. Having trained health workers in every village eliminates distance, time and travel costs to PHC clinics, thereby increasing the numbers of people served. The mobilization of CHWs thus is a way to bring services to people in areas that the official health services cannot reach[6-7].

In 2009, Kalasin provincial health office declared Kalasin village health posts (VHP) project. The objective of Kalasin village health posts is to increase health service distributions to community especially outreach areas to improve and close gap of health services between sub-district health centers and communities, to facilitate community participation, to establish health information and learning centers and to be village health volunteer's offices. This service may improve access to care, quality of care, health outcomes, patient satisfaction and use of hospital services[8-14].

In 2011, 698 VHPs had been established, due to diversified variety of general characteristics of VHPs, resources supplied to VHPs, various management style in VHPs, caused a wide range of the performance of VHPs. Therefore, the aim of this study was to examine factors influencing the performance of Kalasin village health posts. The findings suggested further strategies for improving the performance of VHPs which would be implemented to strengthening health system in rural areas.

Methods

A descriptive study was conducted to examine the association between general information, material and financial support, management in VHPs with the performance of VHPs. The target population consist of 698 assembled village health posts in Kalasin province, Thailand. A sample size was estimated using a confidence interval of 95%, an acceptance error of 5%, and proportion of the high performance of 0.89 in 2011[15]. The required sample size of 124 VHPs was drawn from all 18 districts of Kalasin province using stratified random sampling. The data collection was conducted during June 2012 to December 2012 after getting the permission from Ethic committee of Kalasin hospital (HEB-01 Puh-5501-01).

Research instruments

Self-administered questionnaire was used for the data collection. There were three parts of the questionnaire. The first part for health officers which was about information of village and village health posts, composed of general information, resource available in VHPs and summary of activities done in VHPs during last 12 months. The second part was for village health volunteers consisted of training received and experienced time as a village health volunteer. The third part was for community leaders consisted of participation in VHP execution and planning.

The performance of the VHP was an operating result of VHPs composed of activities done in a VHP, basic medical care, which included first aid care, health promotion and disease control. The performance of VHPs was categorized into two levels: 1) high level of the performance if the mean number of cases per day who received activity done from a VHP more

than the mean of activity of all VHPs, and 2) low level of the performance if the mean number of cases per day who received activity done from a VHP less than the mean of activity of all VHPs.

Participation of community leader in VHP execution community leader composed of local government executives, member of local government committee, village headman and village headman assistant, and leader of community health group in village. The level of participation in VHP execution was evaluated by five- point rating scale question as follows:

5 = a lot of participation

4 = quite a lot of participation

3 = moderate participation

2 = a few participation

1 = no participation

The mean of all community leader participation was used to be the cut off point for levels of participation. The levels of participation of community leader in VHP execution was categorized to

1. High participation group: mean level of community leader of in the village was more than the mean level of all community leaders.

2. Low participation group: mean level of community leader of in the village was less than the mean level of all community leaders.

All questionnaires were checked with content validity by 3 experts in field of health system for the suitability of questions, using language, relevant to objectives of the study. After editing the questionnaires, a pretest was conducted among 30 participants to test for reliability of questionnaire. Cronbach's Alpha for participation in VHP execution and planning was 0.877.

Data analysis

Univariate analysis was used to describe the data using number and percentage of each independent and dependent variable. For Bivariate analysis, Chi-square tests were used to identify the association between each independent variable and the performance of VHPs. Multiple logistic regression was used to determine associations between independent variables and the performance of VHPs.

Results

One hundred and twenty four VHPs were randomly selected from total 698 VHPs. Questionnaires in Thai language were completed and returned from 92 VHPs. Therefore, the response rate was 74.2 %. Table 1 shows 41.3 % were located in the irrigation area. 84.8 % had community health group. 77.2 % received community fund. 80.4 and 71.7 % were remote and constructed VHPs respectively.

Table 2 shows number of VHPs in relation to the levels of community leader participation in village health plan development and VHP execution. Approximately 94 % and 87 % of VHPs were categorized as high participation group for village health plan development and VHP execution respectively.

Table 3 shows the percentages of the health care activities provided by village health volunteers in VHPs: 41.9 % for the first aid care, 58.1 % for health promotion, prevention and disease control. An average activity per day for first aid, health promotion and disease control, and total activities was 1.5, 2.08 and 3.58 cases respectively.

Mean activity per day (3.58 cases per day) was used as the cut-off point. Table 4 shows 38% and

Table 1 Distribution of village health posts by general characteristics

Variables	Number	Percent
Village topography		
Irrigation area	38	41.3
No Irrigation area	54	58.7
Community health group		
With community health group	78	84.8
No community health group	14	15.2
Community Fund		
Community fund received	71	77.2
No community fund received	21	22.8
The distance from a VHP to a health center		
Remote VHP*	74	80.4
Close by VHP	18	19.6
Construction		
Constructed VHP	66	71.7
Under or no construction VHP	26	28.3
Experiences as a VHV		
High **	87	94.6
Low	5	5.4
VHV training		
Complete trained	59	64.1
Incomplete trained	33	35.9

*Distance to sub-district hospital or district hospital > 3 kilometers

**working duration as VHV was ≥ 5 years

Table 2 Distribution of VHPs by levels of community leader participation in village health plan development and VHP execution

Levels of participation	Developing village health plan	VHP- execution
	Number (%)	Number (%)
High participated VHPs	86 (93.5)*	80 (87.0)**
Low participated VHPs	6 (6.5)	12 (13.0)
Total	92 (100.0)	92 (100.0)

* Mean of participation > 3.74

**Mean of participation > 3.69

Table 3 Health care activities provided by village health volunteers in VHPs

Performance	Total	Percent	Cases per day
First aid care	19,168	41.9	1.5
Health promotion, prevention and disease control	26,616	58.1	2.08
Total	45,784	100.0	3.58

Table 4 Distribution of VHPs by levels of the performance

Performance levels	Number	Percent
High *	35	38.0
Low **	57	62.0

* average activity > 3.58 cases per day

** average activity ≤ 3.58 cases per day

62% of VHPs were categorized into high and low levels of the performance respectively.

Table 5 shows factors influencing the performance of VHPs. There were five significant factors: community health group (p-value 0.047), community fund received (p-value 0.041), remote VHPs (p-value 0.037), financial support for village health volunteer (p-value = 0.021), and participation of community leader in VHP execution (p-value = 0.023).

Table 5 Factors associated with the performance of VHPs

Independent variables	n	Performance		Crude OR	p - value
		High (%)	Low (%)		
Having community health group					
Yes	78	42.3	57.7	4.40 (0.92 – 20.99)	**0.047***
No	14	14.6	85.4	1	
Receiving Community Fund					
Yes	71	43.7	56.3	3.92 (1.01-10.78)	**0.041***
No	21	18.8	81.2	1	
Distance from VHP to health center					
Remote VHP	74	43.3	56.8	3.81 (1.01-14.29)	**0.037***
Close by VHP	18	16.8	83.3	1	
Financial support for village health volunteer					
Supported	16	49.7	50.3	5.36 (2.04-9.88)	**0.021***
Not supported	76	43.5	56.5	1	
Experience as a VHV					
High	87	39.1	60.9	2.57 (0.27-23.94)	0.393
Low	5	20.2	79.8	1	
VHV training					
Complete training	59	32.3	67.8	0.51 (0.21-1.21)	0.123
Incomplete training	33	48.5	51.5	1	
Participation of community leader in village health plan development					
High	86	38.4	61.6	1.25 (0.22-7.18)	0.806
Low	6	33.7	66.3	1	
Participation of community leader in VHP execution					
High	80	42.6	57.5	8.13 (1.00-66.03)	**0.023***
Low	12	8.4	91.6	1	

* Significant at p-value < 0.05

Table 6 Multiple logistic regression for predictors of the performance of VHPs

Factors	Adj. OR	95% CI for OR		p-value
		Lower	Upper	
Having community health group				
Yes	4.39	0.82	3.65	0.085
No	1			
Receiving community health fund				
Yes	3.23	0.87	11.97	0.079
No	1			
Distance from VHP to health center				
Remote VHP	3.18	0.75	13.52	0.116
Close by VHP	1			
Financial support for village health volunteers				
Supported	5.90	1.16	30.11	0.033*
Not supported	1			
Participation of community leader in VHP execution				
High	10.19	1.17	88.67	0.035*
Low	1			

* Significant at p-value < 0.05

All significant variables from the Chi-square tests were included in the model of multiple logistic regression to define significant predictors for the performance of Kalasin VHPs, VHPs with financial support for village health volunteer (p-value = 0.033) and VHPs with high participation of community leader in VHP execution (p-value = 0.035) were significant associated with the performance of VHPs as shown in Table 6.

Discussion

In this study, the performance of VHPs was an operating result of VHPs which composed of activities done in VHPs. Only 38 % were categorized into the high level of the performance. Factors influencing the high level of the performance of VHPs were general characteristic factors, material and financial support factors and management factors.

For general characteristic factors, community health group, community fund received, and remote VHPs were significantly associated with the high level of the performance of VHPs (p-value < 0.05). This finding was consistent with study of Somsop[16]. There was significant association between community fund received and the performance of VHPs. However, this factor was not significant association in multiple logistic regression. This may be the amount of health fund was too small. There was no significant association between VHP construction and the performance of VHPs. The reason to explain this finding may be VHVs have capability to adapt other places for working such as their home, a temple, village hall etc. About seventy- one percent of VHPs were constructed in Kalasin province and it was Kalasin health policy to encourage to increase number of VHPs. This finding was consistent with the finding of Limpawitthayakul[17] which suggested to assemble and locate a VHP in an appropriate area.

For the financial factor, there was significant association between financial support for health volunteers and the performance of VHPs. In the final model of multiple logistic regression found financial support for health volunteers was a significant predictor for the high level of the performance (p-value=0.033). When controlling for other factors, VHPs with financial support were 5.9 times more like to have high performance than those without support. This find was consistent with the studies of Limpawitthayakul[17] and Suwannarong[18].

This study found community leader participation in VHP execution was a predictor for the performance of VHP (p-value=0.035). High participation of community leader in VHP execution was 10.2 time more likely to have the high performance than those having low participation. This finding was consistent with study of Sritavong[19] and study of Somjitskul[20]. There was no significant association between VHV factors and the performance of VHPs. Eighty-one percent of VHVs were trained in the course for VHVs.[21] The reason for non-significant may be most of VHV had well trained experience from on the job training instead of formal training. This finding quite inconsistent with a study by Inbute[22] which found that the performance of VHV was depended on education level, position in the village, training and supervise regularly.

The low response rate of the questionnaires was the major concern of the limitation of this study, this may reduce the power of prediction of this study and also fail to detect some significant factors. The village health posts are very unique for health system in North East of Thailand; the finding may not be generalized to other village health posts at the national level and other countries.

In conclusion significant predictors for the performance of VHP composed of financial support for village health volunteer and participation of community leader in VHP execution. VHPs with financial support for health volunteer were 5.9 times more likely to have the high performance than those with no financial support. The VHPs with high level of the community leader participation in execution of VHPs was 10.2 times more likely to have the high performance than those with low participation. Therefore, the strategies for increasing the performance of VHPs in Kalasin province should consist

of a strategy to provide financial support for village health volunteers and a strategy to promote community leader participation in VHP execution.

Recommendations

The strategies to increase the performance of VHPs in Kalasin province should consider financial support and promoting community leader participation in VHP execution. The strategy to provide financial support for village health volunteers. To remunerate VHVs for working in VHPs there may be two ways to do. Firstly, remunerate by non- financial way; giving renowned VHVs, prestige certificate for VHVs who donate their time in VHPs. Secondly, financial remuneration; sources of financial remuneration may from the local fund which yearly distribute from national health security and may come from village fund which receive the budget from member in the village.

The community leaders should be more encouraged to have high participation in VHP execution, the strategy may consist of four issues: 1) giving village health information from health officers to make awareness in community health problem, 2) Training community leaders to understand concept of health security, social security, and economic security which are interdependent, 3) promoting more involvement of community leaders in developing village or community health plans, and 4) concerning about results of monitoring community health plans and feedback.

Acknowledgements

We would like to express our sincere gratitude to Dr. Pisit Aeuwongkul, Director of Provincial Health Office for his approval to conduct this study and Dr. Theraput Sutipapha, Mr. Piya Chanhompung for the data collection. We would like to thank all respondents, village health volunteers and community leaders, for participating in this study.

References

1. World Health Organization. Regional Conference on Revitalizing Primary Health Care Jakarta, Indonesia, 6-8 August 2008: World Health Organization. [Cited 2018 June 1] Available from: http://www.searo.who.int/en/Section1243/Section2538.htm.
2. Tangcharoensathien V, Wibulpholprasert S, Nitayaramphong S. Knowledge-based changes to health systems: the Thai experience in policy development. Bull World Health Organ. 2004;82(10):750-6.
3. De Maeseneer J, Moosa S, Pongsupap Y, Kaufman A. Primary health care in a changing world. Br J Gen Pract. 2008;58(556):806-9, i-ii.
4. World Health Organization. Community health workers: What do we know about them? World Health Organization 2007. [Cited 2018 December 15] Available from: www.who.int/healthsystems/round9_7.pdf.
5. Suvanavejh, C. Thailand primary health care profile. Primary Health Care Office, Office of Permanent Secretary, Ministry of Public Health, Bangkok. 1992.

6. Kauffman KS, Myers DH. The changing role of village health volunteers in northeast Thailand: an ethnographic field study. Int J Nurs Stud. 1997;34(4):249-55.
7. World Health Organization. Strengthening the performance of community health workers in primary health care: report of a WHO Study Group: World Health Organization; 1989. [Cited 2018 December 10] Available from: ttp://whqlib-doc.who.int/trs/WHO_TRS_780.pdf.
8. Gruen R, Weeramanthri T, Knight S, Bailie R. Specialist outreach clinics in primary care and rural hospital settings (Cochrane Review). Community Eye Health. 2006;19(58):31.
9. Bowling A, Bond M. A national evaluation of specialists' clinics in primary care settings. Br J Gen Pract. 2001;51(465):264-9.
10. Nakar S, Vinker S, Lustman A, Hyam E. Outreach clinics in Israel: a common but unregulated phenomenon. Fam Pract. 1999;16(2):149-51.
11. Golnick C, Asay E, Provost E, Van Liere D, Bosshart C, Rounds-Riley J, et al. Innovative primary care delivery in rural Alaska: a review of patient encounters seen by community health aides. Int J Circumpolar Health. 2012;71:18543.
12. Jacobs B, Lindelow M, Xayyavong P, Sackett P. Building on community outreach for childhood vaccination to deliver maternal and child health services in Laos: a feasibility assessment. Reprod Health Matters. 2012;20(40):112-21.
13. Powell J. Systematic review of outreach clinics in primary care in the UK. J Health Serv Res Policy. 2002;7(3):177-83.
14. Bond M, Bowling A, Abery A, McClay M, Dickinson E. Evaluation of outreach clinics held by specialists in general practice in England. J Epidemiol Community Health. 2000;54(2):149-56.
15. Kalasin Provincial Health Office. Kalasin provincial health report; 2011. (in Thai)
16. Somsop O. Community Self -reliance on public health: a case study of two community primary health care centers in amphoe Nogrue, Khon Kaen province: Khon Kaen University; 1995.
17. Limpawitthayakul J. Role Performance of Health Volunteers in Community Primary Health Care Center Bungsampan District Petchabun Province: Khon Kaen University; 2002.
18. Suwannarong K. Participation of village health volunteers in the activities of the community' s primary care center in Prayeun district, Khon Kaen province Khon Kaen university 1996.
19. Sritavong S. Factors for success in running primary health care center by health volunteers in Roi-Et Province. Bangkok: Chulalongkorn University; 1997.
20. Somjitskul S. Factors related to the community participation in the activities of community primary health care center in Plapak District of Nakhonphanom Province. Khon Kaen: Khon kaen 1996.
21. Suwannachat B. Factors influencing the performance of village health posts in Kalasin Province, Thailand. [M.P.H.M. thesis]. Nakhon-pathom: Faculty of Graduate Studies, Mahidol University; 2013.
22. Inbute A. Effectiveness of Health Volunteer's Performance in Community Primary Health Care Center at Lua-ammnart sub-district, Amnartcharo-ern Province. Chiang Mai: Chiang Mai University 1994.