ORIGINAL ARTICLE

Performances of village health volunteers in elderly care in Muang District, Nakhon Ratchasima Province, Thailand

Osamu Watanabe[1], Jiraporn Chompikul[2], Aroonsri Mongkolchati[2] and Nuanpan Pimpisan[3]

[1] *M.P.H.M., ASEAN Institute for Health Development, Mahidol University*
Faculty of Physical Therapy, Morinomiya University of Medical Sciences, Osaka, Japan
[2] *Ph.D., ASEAN Institute for Health Development, Mahidol University*
[3] *M.N.S, Choho Primary Care Unit, Maharatnakhonratchasima Hospital*

Corresponding author: *Jiraporn Chompikul* ***Email:*** *jiraporn.chm@mahidol.ac.th*
Received: *1 May 2014* ***Revised:*** *7 August 2014* ***Accepted:*** *7 August 2014*
Available online: *August 2014*

Abstract

Watanabe O, Chompikul J, Mongkolchati A and Pimpisan N.
Performances of village health volunteers in elderly care in Muang District,
Nakhon Ratchasima Province, Thailand
J Pub Health Dev. 2014; 12(2): 3-17

A cross-sectional study was conducted to examine an association between performance levels of Village Health Volunteers (VHVs) in elderly care and related factors. The performances referred to the levels of activities for the assigned roles and tasks related to elderly care which composed of three scales: Instrument Active Daily Living scale (IADL), Active Daily Living scale (ADL) and other home cares. A total of 415 self-administered questionnaires were distributed to VHVs in February, 2014. Chi-square tests and multiple logistic regression were employed to identify significant predictors of VHVs performances.

Approximately 26% of VHVs were classified into high performances in elderly care. When adjusting for working hours per day and having experience of taking care of the elderly, significant predictors were: number of trainings that VHVs participated in Adj OR=2.54, 95% CI=1.45-4.45), levels of knowledge (Adj OR=2.51, 95% CI= 0.94-6.75 for good level and Adj OR = 1.41, 95% CI = 0.56-3.57 for moderate level) and high satisfaction with working in elderly care (Adj OR: 2.10, 95% CI= 1.14-3.88). VHVs who had good knowledge about elderly care were nearly three times more likely to show high performances than those who had poor knowledge.

The findings suggested that two significant key factors to gain high levels of VHVs' performance in elderly care are providing a variety of refresher courses related to elderly care to increase knowledge and skills, and also improving the work place support system and incentives to promote satisfaction of VHVs

Keywords: Village health volunteers, performances, elderly care

วารสารสาธารณสุขและการพัฒนา
ปีที่ 12 ฉบับที่ 2 พฤษภาคม - สิงหาคม 2557

การปฏิบัติงานของอาสาสมัครสาธารณสุขประจำหมู่บ้านในด้านการดูแลผู้สูงอายุในอำเภอเมือง จังหวัดนครราชสีมา ประเทศไทย

โอซามุ วาตานาเบ้[1] จิราพร ชมพิกุล[2] อรุณศรี มงคลชาติ[2] นวลพรรณ พิมพิสาร[3]

[1] *M.P.H.M. สถาบันพัฒนาสุขภาพอาเซียน มหาวิทยาลัยมหิดล*
คณะกายภาพบำบัด วิทยาศาสตร์การแพทย์ มหาวิทยาลัยโมริโนมิยา โอซาก้า ญี่ปุ่น
[2] *Ph.D. สถาบันพัฒนาสุขภาพอาเซียน มหาวิทยาลัยมหิดล*
[3] *M.N.S. ศูนย์สุขภาพชุมชนจอหอ โรงพยาบาลมหาราชนครราชสีมา*

บทคัดย่อ

โอซามุ วาตานาเบ้ จิราพร ชมพิกุล อรุณศรี มงคลชาติ และนวลพรรณ พิมพิสาร
การปฏิบัติงานของอาสาสมัครสาธารณสุขประจำหมู่บ้านในด้านการดูแลผู้สูงอายุในอำเภอเมือง จังหวัดนครราชสีมา ประเทศไทย
ว.สาธารณสุขและการพัฒนา. 2557; 12(2): 3-17

การศึกษานี้เป็นการเก็บข้อมูลแบบภาคตัดขวางเพื่อศึกษาความสัมพันธ์ระหว่างการปฏิบัติงานของอาสาสมัครสาธารณสุขประจำหมู่บ้าน (อสม.) ในด้านการดูแลผู้สูงอายุและปัจจัยที่เกี่ยวข้อง การปฏิบัติงานในด้านการดูแลผู้สูงอายุจะประกอบด้วยองค์ประกอบ 3 ด้าน ได้แก่ ความสามารถในการการทำกิจวัตรประจำวันที่ต้องใช้อุปกรณ์ ความสามารถในการทำกิจวัตรประจำวันพื้นฐาน การดูแลผู้สูงอายุที่บ้าน เก็บรวบรวมข้อมูลจากอสม. จำนวน 415 คน โดยใช้แบบสอบถามในเดือนกุมภาพันธ์ 2557 วิเคราะห์ข้อมูลโดยใช้การทดสอบไคสแควร์และการถดถอยโลจิสติกเพื่อค้นหาปัจจัยที่มีความสัมพันธ์กับการปฏิบัติงานของอสม.

ร้อยละ 26 ของอาสาสมัครสาธารณสุขประจำหมู่บ้าน ได้ปฏิบัติงานในด้านการดูแลผู้สูงอายุอยู่ในระดับดี เมื่อนำจำนวนชั่วโมงการปฏิบัติงานต่อวัน และการมีประสบการณ์ในการดูแลผู้สูงอายุมาร่วมพิจารณา ปัจจัยที่มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับการปฏิบัติงานของอสม.ได้แก่ จำนวนครั้งของการฝึกอบรมที่อสม. ได้เข้าร่วม (Adj OR = 2.54, 95% C I= 1.45-4.45) ระดับความรู้ (Adj OR = 2.51, 95% C I= 0.94-6.75 สำหรับระดับความรู้ดีและ Adj OR = 1.41, 95% C I= 0.56-3.57 สำหรับระดับความรู้ปานกลาง) และความพึงพอใจกับการดูแลผู้สูงอายุในระดับสูง (Adj OR = 2.10, 95% C I= 1.14-3.88) อสม.ที่มีระดับความรู้ดีในด้านการดูแลผู้สูงอายุมีแนวโน้มเกือบสามเท่าที่จะปฏิบัติงานในด้านการดูแลผู้สุงอายุได้ดี

ข้อเสนอจากผลการวิจัยนี้ อสม.ควรได้รับการส่งเสริมการเพิ่มศักยภาพ ในการดูแลผู้สูงอายุ ได้แก่ การจัดหลักสูตรฝึกอบรมด้านการดูแลผู้สูงอายุให้มีความหลากหลายเพื่อเพิ่มความรู้และทักษะด้านการดูแลผู้สูงอายุให้อสม. ควรสร้างแรงจูงใจให้มากขึ้น พร้อมทั้งปรับปรุงระบบการให้ความสนับสนุนของสถานที่ทำงานเพื่อส่งเสริมให้อสม.มีความพึงพอใจในงานดูแลผู้สูงอายุเพิ่มมากขึ้น

คำสำคัญ: อาสาสมัครสาธารณสุขประจำหมู่บ้าน การปฏิบัติงาน การดูแลผู้สูงอายุ

Introduction

Global population aging is a process known as the "demographic transition" which mortality and fertility decline from higher to lower levels. Decreasing fertility along with lengthening life expectancy has changed the age distribution of the population in most regions of the planet.[1] Although first it started in the developed countries, it became apparent even though in developing countries.[2]

In Thailand, as with other countries, the population is rapidly aging. In 2009, the life expectancy in Thailand was 70 years, and 11.5% of the population was aged 60 years or over, this is estimated to double by 2025. Moreover, it is expected to increase till 25% by 2030.[3,4]

Although longevity of Thai elderly is improving, it does not always mean that they can continue in good health in right up to the end. The number of elderly who are suffering from non-communicable diseases has been increasing. Non communicable disease such as diabetes, hypertension and chronic obstructive pulmonary disease (COPD) are top ranked causes of morbidity and mortality in Thailand while the case of malaria and diarrheal diseases are decreasing.[5-8]

One serious consequence of declining health and increased frailty associated with ageing is difficulty of physical movement. Caregivers for those elderly are almost exclusively family members, wives are the most common caregivers for men while children or children-in-law are for women.[9,10]

However co-resident with children has been decreasing over the last two decades, from 77% in 1986 to 59% in 2007. Besides, elderly who live alone or only with spouse have been increasing steadily and reached till nearly one-fourth from 11%.[9,11]

This changing of living arrangement brought important questions in future, who will take care of elderly requiring long-term care? Is it possible to maintain family member, especially their children, as caregivers for them? These questions will be the biggest challenges that Thai society face in near future.[11]

With increasing demand of elderly caregivers, Ministry of Social Department and Human Security initiated the project that encouraging people to serve as VHVs to provide care for elderly people in the community. The statistics indicated that there are approximately 5,000 VHVs engaging elderly cares and providing care for around 50,000 elderly people in 2007.[9]

Thus, recently demands of village health volunteers providing elderly cares have been increasing rapidly, in the context of growing longevity, diversifying chronic diseases and decreasing family members taking care of them in aging community. However, there are only a few studies of performance of VHVs in elderly care. Therefore, the aim of this study was to explore the performance of VHVs in elderly care and factors associated with the levels of performance in Muang district, Nakhon Ratchasima province, Thailand.

Methods

A cross sectional study was conducted among VHVs who have engaged in elderly home care for more than one year prior to February 2014 after obtaining approval from the ethics committee of Mahidol University Institutional Review Board (COA.No.MU-IRB:2014/005.0601).

Muang district Nakhon Ratchasima province was selected for this study since this area has largest

population of elderly in Thailand. Two-stage cluster sampling was employed to draw a sample. Six out of 25 sub-districts were chosen by a simple random sampling technique. VHVs were randomly selected from each sub-district to obtain a sample of 402 VHVs proportional to the size of the sub-districts. The sample size was calculated using a confidence interval of 95%, with the allowance error of 5%, proportion of high performance of VHVs of 50% and population size of 7115.[12]

Anonymous and self-administrated questionnaires comprised 59 questions and were divided into nine parts as follows; socio-demographic factors (12 questions), training experience for elderly care (6 questions), knowledge of elderly care (7 questions), attitude towards elderly care (5 questions), intention to leave (6 questions), absenteeism (2 questions), motivation (6 questions), job satisfaction (9questions) and performance of VHVs in elderly care (6 questions).

The knowledge questionnaire consisted of five parts: first aid, nutrition, general risk factors related to diabetes, oral care, exercises and depression. The reliability (KR-20) of this part was equal to 0.5. In order to measure the VHVs' knowledge of the above factors, a score was given 1 point for correct answers and 0 point for incorrect answers. After summing up the total knowledge score, it was divided into three levels according to Bloom's criteria as follows[13]: good if score more than 80% of total scores, fair if score from 60% to 80%, poor if score less than 60%.

VHVs' attitude towards elderly people was composed by Kogan's old people scale.14-15 The scale included both positive and negative statements about elderly people and was assessed by a five point scale. The answers ranged from 1 (strongly disagree) to 5 (strongly agree) for positive statements and vice versa for negative ones. After summing up the total score, it was classified into positive or negative by using a cut-off point at the score of the 75th percentile.

VHVs' motivation was comprised by two combined volunteer motivation scales: one was developed by Esmond (2004) and the other was developed by Strigas and Jackson (2003).[16] The scale ranged from 1 (strongly disagree) to 5 (strongly agree). After summing up the total motivation score, it was divided into high or low levels of motivation by using cut-off point at the score of the 75th Percentile.

Job satisfaction was measured using the based on Nursing Home Nurse Aid Job Satisfaction Questionnaire (NHNA-JSQ). This scale was modified to assess VHVs satisfaction with 7 subscales: a) Coworkers b) Work place support c) Work content d) Self-confident e) Training opportunity f) Rewards g) Global job satisfaction.[17] The Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied) was used in the questionnaire. After summing up the total job satisfaction scores, they were classified into high or low levels of satisfaction by using cut-off point at the score of the 75th Percentile. The reliability (Cronbach's alpha) for attitude, motivation and satisfaction were 0.6, 0.7 and 0.9 respectively.

Performance in elderly care composed of three components, modified instrument active daily living scale (IADL), active daily living scale (ADL) and other home cares. IADL consisted of instrumental activities such as grocery shopping, food preparation, housekeeping and hospital visits. ADL included living activities such as dressing, bathing and toileting. Other home care comprised of activities such as blood pressure readings, teaching exercises and providing

mental support to the elderly. VHVs were asked about the frequency of these performance (always, sometimes, few and never). The likert-scale was used for scoring the responses from 3 to 0 respectively. The total score was categorized into high or low levels of performance by using cut-off point at the score of the 75th Percentile.[18]

For reliability, the questionnaire was pretested among 32 VHVs at a PCU in Mahasawad sub-district in Phuthamonthon district, Nakhon Pathom province. The knowldege section was measured by the Kuder-Richardson formula 20 (KR-20). Attitude, motivation and satisfaction were examined by Cronbach's alpha. The result of KR-20 was 0.5. The Cronbach's alpha coefficient for attitude, motivation and satisfaction were 0.6, 0.7 and 0.9 respectively.

Descriptive statistics were employed to describe all variables. Chi-square tests and multiple logistic regression were used to examine an asssociation between independent variables and VHVs' peformances in elderly care.

Results

Most of the VHVs were over 50 years old and the median age was 55 years old. Almost all the VHVs (94.9%) were female and a majority of them (66.7%) were married. Half of the VHVs finished primary school and nearly one-third of the VHVs finished secondary school. The duration of working ranged from 1 to 33 years and the median duration was 10 years.

Regarding training experience, the majority of VHVs (81.4%) had previous training programs. Among them, 72.3% of the VHVs finished 1-3 programs, whereas only 27.7% of the VHVs had finished more than three programs. The median number of training experience was three times (Table 1).

Table 1 Percentage of respondents by socio-demographic factors and training experiences

Socio – demographic factors	Number	Percent
Age group (years)		
≤ 50	130	31.4
51- 60	174	42.0
> 60	110	26.6
Median = 55.0, QD = 6.5, Min = 23.0, Max = 80.0		
Gender		
Male	21	5.1
Female	394	94.9
Marital status		
Single	36	8.7
Married	277	66.7
Divorced	23	5.5
Widow	63	15.2
Separated	16	3.9
Highest education		
Primary school	213	51.4
Secondary school	128	30.9
Vocational school	39	9.4
Bachelor	34	8.2
Duration of working as VHV (years)		
6 and lower	136	35.1
7-10	127	32.8
11 and above	124	32.0
Median = 10.0, QD = 3.5, Min = 1.0, Max = 33.0		
Training experience of elderly care		
Yes	338	81.4
No	77	18.6
Number of training VHVs participated		
High (more than 3 times)	86	27.7
Low (1- 3 times)	224	72.3
Median = 3.0, QD = 1.0, Min = 1.0, Max = 20		

Most of the VHVs (61.9%) had a moderate knowledge levels. Slightly over one-fifth of the VHVs (22.5%) had high motivation levels and nearly one-fifth of the VHVs (19%) had high satisfaction levels. Slightly over one-fourth (26.2%) of them showed high performance levels (Table 2).

From the performance result, it was found that IADL care was very common among VHVs especially, grocery shopping, housekeeping and going to a hospital were conducted by nearly 70% of the VHVs. As for ADL care, the support of sitting, transfer, ambulation were provided by more than 60% of the VHVs and support for toilet usage and grooming were offered by about 50% of the VHVs. With other care, nearly 90% of the VHVs conducted blood pressure readings, checking blood sugar, exercises, family advices and mental support were also provided by approximately 80% of VHVs.

Table 2 Percentage of respondents by levels of knowledge, motivation, satisfaction and performances

Variables		Number	Percent
Knowledge levels			
Good	(> 12 scores)	95	22.9
Moderate	(9-12 scores)	257	61.9
Poor	(< 9 scores)	63	15.2
Motivation levels			
High		93	22.5
Low		320	77.5
Satisfaction levels			
High		79	19.0
Low		336	81.0
Performance levels			
High		108	26.2
Low		304	73.8

The following factors were significantly associated with VHVs performance in elderly care: experience with taking care of the elderly, belonging to a religious group or committee, those who were persuaded to be a VHV, training experience in elderly care, number of trainings, the year of last training, knowledge levels, intention to continue volunteering, working hours per day, absenteeism in a month, motivation levels and satisfaction levels (Table 3). In contrast, the non-significant factors were: socio-demographic factors (age, gender, marital status, education, occupation, family income, duration of working and commuting time), family structure, attitude toward the elderly and intention to leave.

Table 3 Association between significant factors and performances

Variables	Performances of VHVs in elderly care				
	n	High %	Low %	Crude OR (95% CI)	P-value
Experience of taking care of elderly					0.033*
Yes	329	28.6	71.4	2.30 (1.05-3.95)	0.036*
No	73	16.4	83.6	1	
Member of religious committee					0.020*
Yes	17	52.9	47.1	3.36 (1.26-8.96)	0.015*
No	395	25.1	74.9	1	
Person who persuaded to be a VHV(Self decision)					0.046*
Yes	258	22.9	77.1	1	
No	154	31.8	68.2	1.57 (1.01-2.46)	0.046*
Training experience of elderly care					0.031*
Yes	338	28.4	71.6	2.05 (1.06-3.97)	0.034*
No	77	16.2	83.8	1	
Number of trainings					<0.001***
High(more than 3 times)	86	44.2	55.8	2.62 (1.55-4.43)	<0.001***
Low (1-3 times)	224	23.2	76.8	1	
The year of last training					0.035*
2013	239	31.8	68.2	1.84 (1.04-3.26)	0.037*
Before 2013	94	20.2	79.8	1	
Knowledge levels					0.029*
Good	95	35.8	64.2	2.58 (1.19-5.61)	0.016*
Moderate	255	24.7	75.3	1.52 (0.75-3.10)	0.247
Poor	62	17.7	82.3	1	

Table 3 Association between significant factors and performances (cont.)

Variables	Performances of VHVs in elderly care				
	n	High %	Low %	Crude OR (95% CI)	P-value
Intention to continue					
Volunteer					0.013*
Forever	333	28.8	71.2	2.26 (1.17-4.37)	0.015*
Not forever	79	15.2	84.8	1	
Working hours per day					0.005**
1-2 hours	315	22.9	77.1	1	
More than 2 hours	97	37.1	62.9	1.99 (1.22-3.25)	0.006**
Absenteeism in a month					0.038*
None	258	29.8	70.2	1.66 (1.03-2.69)	0.036*
More than once	147	20.4	79.6	1	
Motivation levels					0.023*
High	93	35.5	64.5	1.78 (1.08-2.98)	0.024*
Low	317	23.7	76.3	1	
Satisfaction levels					<0.001***
High	79	41.8	58.2	2.47 (1.47-4.13)	0.001**
Low	333	22.5	77.5	1	

* P-value < 0.05 **P-value < 0.01 *** P-value < 0.001

In multiple logistic regression, the following factors were found to be significant predictors for high performance levels in elderly care: working hours per day, experience in taking care of the elderly, the number of trainings VHVs participated in and satisfaction levels. In addition, knowledge levels were nearly significant.

The most significant predictor of high levels performance in elderly care was the number of trainings that the VHVs participated in. VHVs who participated in training more than three times were 2.54 times more likely to show high performance levels than those who participated less than three times when adjusting for other factors (Table 4).

Table 4 Multiple logistic regression for high performance levels in elderly care

Variables	Adj. OR	95% C.I.		P-value
		Lower	Upper	
Working hour per day				
1-2 hours	1			
More than two hours	1.90	1.04	3.49	0.037*
Experience of taking care of elderly				
Yes	2.65	1.11	6.31	0.028*
No	1			
Number of training VHVs participated				
High participation (More than 3 times)	2.54	1.45	4.45	0.001**
Low participation (1-3 times)	1			
Knowledge levels				0.087
Good	2.51	0.94	6.75	0.068
Moderate	1.41	0.56	3.57	0.467
Poor	1			
Satisfaction levels				
High	2.10	1.14	3.88	0.018*
Low	1			

* P-value < 0.05 ** P-value < 0.01

Discussion

Slightly over one-fourth of VHVs (26.2%) showed high performance in elderly care. Almost all the VHVs (94.9%) were female and a majority of them (66.7%) were married. Half of the VHVs finished primary school and nearly one-third of VHVs finished secondary school. These characteristics were similar to other studies.[18-21] However, VHVs in this study were predominantly elderly females: Most of VHVs were over 50 years old and the median age was 55 years old which differs from previous studies reported in other countries.[18-21] It might be because the number of young people who live outside of their homes to work in big cities has been increasing and also they might not be interested in volunteering in their communities.[9,11]

In the Chi-square tests, when adjusting for other factors, the following 12 factors were found to be significant predictors for performance: working hours per day, experience in taking care of the elderly, the

number of trainings VHVs participated in, satisfaction with elderly care. Knowledge levels about elderly care were nearly significant associated with VHVs performance.

As for working hours per day, VHVs who provided services more than two hours per day were nearly twice more likely to show high performance levels than those who did not. These findings were consistent with the results of a previous study which concluded that caregivers who were in a engaging elderly care more than 40 hours per week were more likely to provide a variety of assistance as opposed to those engaging in less hours.[22] It may be that VHVs who work more than two hours per day can afford the time to serve diligently and perform more efficiently than those working less than two hours.

Regarding experience in taking care of elderly at their homes, VHVs who had the experience were 2.65 times more likely to show high performance levels than those who did not. It could be that VHVs learned the skills to cope with diverse problems associated with elderly care from the experience gained at their homes and applied it to the volunteer activities.

The most significant predictor for high performance levels was the number of trainings VHVs participated in. When adjusting for other factors in the model, VHVs who had training more than three times were 2.54 times more likely to show high performance levels than those who had less than three times. The finding is in accordance with previous studies which stated that training is an important component in the success of performance of VHVs.[23-25] Due to the illnesses often afflicting the elderly such as diabetes, aging and depression VHVs are required to provide a variety of additional care such as exercise, nutritional guidance, ADL support and mental support. Hence, most training courses cover both theory in a classroom and practice in community fields.[23]

Similarly, concerning knowledge about elderly care, VHVs who had good knowledge were 2.51 times more likely to show high performance levels over those who had poor knowledge. This finding also corresponds with many previous studies concluding that knowledge is one of the most important factors in determining performance levels of VHVs.[23-26] Therefore, participating in a variety of training courses for elderly care to improve knowledge and skills of VHVs is the key to increase performance of VHVs in elderly care.

Lastly, in regards to satisfaction with elderly care, VHVs who had high levels of satisfaction were around twice more likely to show high performance than those who did not. The majority of the previous studies in voluntary fields agree with the idea that job satisfaction plays an essential role in voluntary performance.[27-29] Satisfied VHVs are more active and improve the quality of performance than dissatisfied VHVs. Therefore the finding confirms that highly satisfied volunteers can greatly put more effort into their performance.

Recommendations

Based on the findings, the following are suggested: Creating policies for the VHVs trainings is necessary so that all VHVs will be able to have a standard level of performance in elderly care. More variety of refresher courses related to elderly care in chronic diseases should be provided regularly to improve the VHVs knowledge and skill base. Work place support and incentives should be improved to promote the satisfaction of VHVs.

Acknowledgements

I thank the staff at PCUs in Choho district and all VHVs who participated in this study.

References

1. Population Division, Department of Economic and Social Affairs. World Population Aging 2007. New York: United Nation; 2007.
2. Chanitta S, Sankoon C and Paiboon B. Development model of Health Care Management for the Elderly by Community Participation in Isan. The Soc Sci. 2009;4(5):439-42.
3. Rattanamongkogul D, Sritanyarat W and Manderson L. Preparing for aging among older villagers in northeastern Thailand. Nurs Health Sci. 2012;14(4):446-51.
4. Banloo S and Sutthichai J. Situation of the Thai Elderly 2009. Bangkok: TQP Ltd.; 2009.
5. Lorga T, Aung MN, Naunboonruang P, Junlapeeya P and Payaprom A. Knowledge of communicable and noncommunicable diseases among Karen ethnic high school students in rural Thasongyang, the far northwest of Thailand. Int J Gen Med. 2013;6:519-26.
6. Porapakkham Y, Pattaraarchachai J and Aekplakorn W. Prevalence, awareness, treatment and control of hypertension and diabetes mellitus among the elderly: the 2004 National Health Examination Survey III, Thailand. Singapore Med J. 2008;49(11):868-73.
7. Suwit W. Thailand Health Profile 2001-2004. Bangkok: Ministry of Public Health; 2004.
8. Aekplakorn W, Bunnag P, Woodward M, Sritara P, Cheepudomwit S, Yamwong S, et al. A risk score for predicting incident diabetes in the Thai population. Diabetes Care. 2006;29(8):1872-7.
9. John K and Napaporn C. Population aging and the well-being of older person in Thailand. Bangkok: UNFPA; 2008.
10. Nijboer C, Tempelaar R, Sanderman R, Triemstra M, Spruijt RJ and Van den bos GA. Cancer and caregiving: the impact on the caregiver's health. Psycho-oncology. 1998;7(1):3-13.
11. John K and Napaporn C. International relationships and family care and support for Thai elderly. Aging Int. 2008;33(1-4):15-27.
12. Health Information system, Primary Health Care Division, Ministry of Public Health. Village health volunteers who get payment 2013 [online] Available from: http://www.thaiphc.net/phc/main/index.php?option=com_wrapper&view=wrapper&Itemid=54 [Accessed 2013 Dec 24].
13. David R.K. Revision of Bloom's Taxonomy:An Overview. Theory into practice. 2002;41(4):212-218.
14. Lambrinou E; Sourtzi P, Kalokerinou A and Lemonidou C. Reliability and validity of the Greek version of Kogan's Old People Scale. J clinical nursing. 2005;14(10): 1241-1247.
15. Hope KW. Nurses' attitudes towards older people: a comparison between nurses working in acute medical and acute care of elderly patient settings. J Advanced Nursing. 1994;20(4):605-12.
16. Judy E and Patrick D. Developing the volunteer motivation inventory to assess the underlying motivational drives of volunteers in Western Australia: Australia: CLAN WA Inc; 2004.

17. Nicholas GC, John E, Ruth A and Aiju M. Job satisfaction of nurse aides in nursing homes: Intent to leave and turnover. The Gerontologist. 2007;47(2):193-204.
18. Nopporn R, Jutatip S and Boonyong K. Performance of village health volunteers on tubeculosis prevention in Mahachanachai district, Yasothon province, Thailand. J Pub. Health Dev. 2010; 8(3):253-64.
19. Ruiz T and Ferreira VM. Community health workers' attitudes and beliefs toward the elderly. Rev Saude Publica. 2012;46(5):843-9.
20. Saji SG, Satyanarayan M and Ashis D. Assessing community health workers' performance motivation: a mixed-methods approach on India's Accredited Social Health Activists (ASHA) programme. BMJ Open. 2012;27;2(5).
21. Sevnaz S, Aliye M, Nil T, Fisun S and Fehmi A. Attitude toward the elderly among the health care providers: Reliability and validity of Turkish version of the UCLA Geriatrics Attitudes (UCLA-GA) scale. Arch Gerontol Geriatr. 2012; 55(1):205-9.
22. Nomjit N and Anpatcha S. Improving Accessibility to Medical Services for Persons with Disabilities in Thailand. J APDR. 2012;23:34-47.
23. Bethesda M. Family care giving in the U.S.: Finding from a National Survey U.S. Census Breau. Washington, DC: National Alliance for Care Giving and The American Association of Retired Person; 1997.
24. Okanurak K. Village Malaria Volunteer in Thailand: An anthropological Approach. San Francisco: Graduate Division of the University of California; 1986.
25. Sranacharoenpong K and Hanning RM. Diabetes prevention education program for community health care workers in Thailand. J Community Health. 2012;37(3):610-8.
26. Sranacharoenpong K, Hanning RM, Sirichakwal PP and Chichang U. Process and outcome evaluation of a diabetes prevention education program for community healthcare workers in Thailand. Educ Health. 2009;22(3):335.
27. Millette V and Gagne M. Designing volunteers' tasks to maximize motivation, satisfaction and performance: The impact of job characteristic on volunteer engagement. Springer Sc. 2008;32(1): 11-22.
28. Ferreira M, Proenca T and Proenca JF. Motivations Which Influence Volunteers' Satisfaction. In: International Conference of the International Society for Third Sector Research. Siena, Italy: 2012.
29. Cnaan RA, Cascio TA. Performance and commitment: Issues in management of volunteers in human services organizations. J Soc Serv Res. 1998;24(3-4):1-37.