

Assessment of Village Health Worker Training Program in Tuguegarao, Philippine

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Objectives : This study was performed to evaluate the effectiveness of 'village health worker training program' which aimed to build community participatory health promotion capacity of community leaders in villages of low developed country and to develop methods for further development of the program.

Methods : The intervention group were 134 community leaders from 25 barangays (village). Control group were 149 from 4 barangays. Intervention group participated 3-day training program. Questionnaire was developed based on 'Health Promotion Capacity Checklist' which assessed capacity in 4 feathers; 'knowledge', 'skill', 'commitment', and 'resource'. Each feather was assessed in 4 point rating scale. Capacity scores between intervention group and control group were examined to identify changes between the pre- and post-intervention periods. A qualitative evaluation of the program was conducted to assess the appropriateness of the program. The program was conducted in Tuguegarao city, Philippine in January, 2009.

Results : The result showed significant increases in the total health promotion capacity and each feather of health promotion capacities between pre and post assessment of intervention group. But there was no significant change in that of control group. Participants marked high level of satisfaction for preparedness, selection of main subjects and education method. Qualitative evaluation revealed that training program facilitated community participatory health promotion capacity of participants.

Conclusions : This study suggested that the Village health worker training program is effective for building health promotion capacity of community leaders and it can be a main method for helping low developed countries with further development.

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Key words : Village health worker, Health promotion capacity, Training program

INTRODUCTION

'Village health worker training program' is a program such that it trains local residents as health workers and deploys them to local communities with no professional health care available. Village health worker training programs have been undertaken by many organizations including WHO, governmental and non-governmental organizations in low developed countries mainly in Asia and Africa since mid 1960s. The term referring to the trainee has been differently used depending on objectives and circumstances, for example, 'village health worker', 'public health worker', 'community health worker' and 'public health aid' [1]. However, the key purpose is to promote the health status of the

local residents who hardly get proper primary health care services in a way that aids the people in need in learning first aid, family planning, nutrition and environmental improvement [2-5]. Early village health worker programs were developed mainly for low developed countries since 'Declaration of Alma-Ata' was agreed in 1978. Such programs are now extensively used across many low developed countries which manage to provide a basic national health service in order to reduce the health or economic inequalities between different regions, races and groups [6-8].

In reality, low developed countries are struggling to fight not only acute and infectious diseases arising from hygienically and economically poor environments, for example, unhygienic water system, housing and diet or

lack of medical service, but also soaring prevalence rate of chronic diseases, for example, hypertension, diabetes and cardiovascular or cerebral vascular diseases. They suffer so called 'double-burden' of disease [9] and have to take the social and economic costs arising from it. The problem is that most low developed countries suffer the uneven distribution and outflow of skilled health workers and input most of their useable resources to acute infectious disease control [10]. The international health aids from developed countries are also limited to basic health care, infectious disease control and environmental hygiene improvement. The current health strategy should be reformed such that more resources are input to general health promotion activities for local communities including chronic disease prevention and control.

Table 1. 8 key features of adult learning^a

1. Adults are involved in all stages of their learning experience
2. Participants are involved in a "purposeful exploration" of particular knowledge or skills, or in reflecting collectively on their shared experiences;
3. Learning takes place in a group setting
4. The overall learning process depends on the experiences, skills and knowledge each participant brings. These qualities will affect how new information is intended and absorbed;
5. Participants' personal qualities can provide the group with valuable learning opportunities;
6. Group members must develop ground rules to ensure respectful communication;
7. The teaching-learning process is based on a continual negotiation of goals, learning methods and evaluation strategies.
8. Adult learning can happen anywhere-not just in a university or formal training.

^a Brookfield [11]

The new public health principles put emphasis on general health promotion and disease prevention in local communities as opposed to the conventional public health system focusing on physical improvement and personal hygiene. The objective is to achieve social equality and justice by means of active interventions on the decisive factors and health promotion programs. The methodology put more emphasis on the participation and contribution of local communities rather than the responsibility of health professionals [12].

The participation and capacity building of communities for health promotion are the key principles that the new public health suggests so that the local residents can control over their local health problems [13] and have reasonable insight on their personal, social, economic and political capacities [12]. WHO early realized that the importance of the community participation and the capacity building for health promotion in the primary health care since Alma Ata declaration and still tries to involve as many communities as possible in many health promotion programs [14,15].

The village health worker training program involve the communities to enhance the health promotion capacity as a potential measure to stop the double burden that most low developed countries confront. The program may contribute to promote health of people in need in a way that trains them to be able to

actively promote their physical and social environments. As the theory of community capacity building points out [16-18], the program is thought to be an effective starting point to establish a consistent health promotion system such that a number of small capacity promotion activities extend over the entire society through interactions between the community members and eventually lead to improved community capacity.

The objectives of this study are to undertake the village health worker training program with the community leaders of Tuguegarao, the Philippines, to perform qualitative and quantitative evaluation of the effects of the program and ultimately to suggest ways to improve and extend the program.

SUBJECTS AND METHODS

I. Target Area and Subjects

The target area is the city of Tuguegarao and adjacent areas, the Philippines. The Philippines is classified as a low income country by the World Bank [19]. Their top 10 causes of death include both acute and chronic diseases, for example, respiratory tract infection, tuberculosis and diarrhea along with cardiovascular and cerebral vascular diseases, hypertension, diabetes and chronic respiratory tract infection [20]. Tuguegarao is located in Cagayan state, the Philippines consisting of the urban area and 49 rural areas in vicinity. The population is 130 thousands and a number of tribal village of 100 to 500 residents are scattered nearby. The main industries include corn, tobacco and rice cultivations and most of the villages do not have medical facilities. Only local residents who passed the 1-week training program work as midwives [21].

Barangay means a village in Tagalog and constitutes the smallest administrative unit of the Philippines. 25 Barangays with population more than 300 and without medical facilities and workers were selected with support from the Philippine Bible Correspondence Center (PBCC). Among the population who can read

and write in Tagalog at the ages between 15 and 55, 5 to 7 subjects were selected per Barangay as recommended by the PBCC and a total of 150 subjects were prepared. The control group was also formed by selecting 150 residents with similar conditions from the population registered in Tuguegarao church, a part of the PBCC.

148 out of 150 subjects (98.6%) participated in the village health worker training program. 134 participants passed the training program and answered the questionnaire. 149 out of 150 subjects in the control group (99.3%) completed the questionnaire.

II. Village Health Worker Training Program

The main purpose of village health worker training program is to improve physical environmental factors such as development of drinking water, latrine construction, waste disposal and also provide better understanding for determinants of health including social environmental factors. For these purposes, an adult learning workshop method based on community participation as well as capacity building was used for three days. In a control group, these training methods were not used. Basic hygiene and environment guidebook of Hesperian foundation [22], village health worker training textbook [23], healthy environment guidebook by WHO [24] and chronic disease management handbook [9] were used for the training text books. The developed textbooks and check lists were collected through advises of professionals for once as well as team meetings, and translated into Tagalog including terminology correction. For specific titles, the first was the importance of collaboration and practice for the improvement of determinants of health including physical and social environments of the community not only limited personal health habit as well as introduction education including encouragement on promoting community participation though 'a ladder of participation' [25]. The second was apprao-

ching methods by community and management guidelines as to basic environment and hygiene matters such as development of drinking water and water purity control, latrines management, waste and sewage disposal in the acute disease managements. In addition, disease tendency and actual prevention skills, environmental models of health and community collaboration for hypertension, diabetes complication, cardiovascular disease were consisted in the chronic disease management part (Appendix 1).

The training program started with lectures on specific subjects for 1-2 hours including a question and answer session followed by a 40-min discussion session according to check lists distributed ahead of this session. For the discussion session, 3-5 participants were consisted of each group. Adult learning principles were used to encourage all participants to involve and be inspired in discussion.

III. Assessment of Village Health Worker Training Program

The effect of the training program was assessed by elevation of health promotion capacity of participants and level of satisfaction for the training program. Firstly, to evaluate participants' health promotion capacity 'knowledge', 'skill', 'commitment' and 'resource' were assessed by pre-post evaluation questionnaires in both the intervention and control groups. Only participants without educational intervention were used for the control group. From reviewing developed tools from Canada [26,27], Australia [28], the USA [29] for health promotion capacity evaluation, we select 'Health Promotion Capacity Checklist' (Checklist) [27] by Prairie Region Health Promotion Research Center, a tool for quantitative analysis of the capacity on public health promotion and then corrected according to new public health principles to develop an evaluation questionnaire. The difficulties and sensible terminology were made by once experimental test (four researchers and Philippines resident in Korea respectively).

Table 2. Characteristics of each feathers of new public health based health promotion capacity^a

Capacity Feathers	Characteristics
Knowledge	<ol style="list-style-type: none"> 1. Holistic understanding of health and its determinants 2. Understanding the fundamental principles of New Public Health 3. Understanding variety of strategies for health promotion. 4. Understanding the contexts within which different health promotion strategies are effective. 5. Familiar with the conditions, aspirations, and cultures of the population with whom I work.
Skills	<ol style="list-style-type: none"> 1. Ability to effectively plan, implement and evaluate health promotion 2. Effective communicating skills to diverse audiences with variety means. 3. Work well with others, in a range of roles and contexts. 4. Systematically gather and use evidence to guide practice. 5. Able to build the capacity of communities and organizations 6. Practice with strategic and selective attitude
Commitment	<ol style="list-style-type: none"> 1. Have energy, enthusiasm, patience and persistence in my work. 2. Value equity, justice, empowerment, participation, and respect for diversity. 3. Flexible, innovative, and willing to take thoughtful risks 4. Learn from my experiences, and from those of others. 5. Confident in my abilities, and am credible in the eyes of others. 6. Believe in and advocate for health promotion.
Resources	<ol style="list-style-type: none"> 1. Have adequate time to engage in health promotion practice. 2. Have tools to aid my practice so that I am not constantly reinventing the wheel. 3. Have the infrastructure needed to practice health promotion. 4. Have supportive managers, colleagues, and allies with whom to work and learn. 5. Access adequate financial resources for my health promotion practice.

^a Prairie Health Promotion Research Center [27]

There were four feathers of 'knowledge', 'skill', 'commitment' and 'resource' on health promotion capacity and 22 questions (Table 2). In the each feathers, it was consisted of 5 questions for 'knowledge' (Cronbach's $\alpha = 0.851$), 6 questions for 'skill' (Cronbach's $\alpha = 0.851$), 6 questions for 'commitment' (Cronbach's $\alpha = 0.867$) and 5 questions for 'resource'. All questions used four point rating scale (point 4= 'excellent', point 3= 'good', point 2= 'fair', point 1= 'bad'). The capacity was evaluated by calculating sum averages per feathers as internal consistency was confirmed for each feather. The evaluation on the program started upon the completion of the training program with separated survey questionnaire which were consisted of 3 open types of questions with five point rating scale (point 5=excellent, point 4=satisfied, point 3=fair, point 2=not satisfied, point 1=very poor). For the quantitative analysis, satisfaction measurement was questioned on the 'training program' including preparation, purpose and training procedure of this program. 'good points', 'benefits' and 'comment for the program improvement' were questioned as a part of the opened type of questions. The collected comments were ordered according to

Table 3. Demographic characteristics of subjects

Characteristics	Intervention group (n=134)	Control group (n=149)
Sex		
Male	20 (14.9)	45 (30.2)
Female	114 (85.1)	104 (69.8)
Age (yr)		
15-19	23 (17.3)	63 (42.9)
20-29	16 (12.0)	42 (28.6)
30-39	30 (22.6)	20 (13.4)
40-49	36 (27.1)	14 (9.5)
50-	28 (21.0)	8 (5.4)
Education		
Elementary school	60 (46.1)	27 (18.8)
Middle school	45 (34.6)	47 (32.6)
High school	23 (17.7)	60 (41.7)
College or University	2 (1.5)	10 (6.9)

a key word of the question and ordered based on the importance. The completed comments were finally suggested after the team meeting.

IV. Statistical Analysis

Paired t-test was conducted to compare the pre- and post-assessments in total and by capacity feather. Dependent t-test was carried out to compare health promotion capacity in total as well as scores per session between the intervention and control group. One-way ANOVA was conducted to show capacity difference depending on general features of the participants. Multiple regression was also carried out for the influence of related variant

Table 4. Pre- to post-test changes in total capacity according to demographic factors

Variables (n)	Intervention group (n=134)			Control group (n=149)			p-value
	Pre-test (mean ±SD)	Post-test (mean ±SD)	Changes	Pre-test (mean ±SD)	Post-test (mean ±SD)	Changes	
Mean score	3.06±0.46	3.25±0.48	0.19*	3.06±0.46	3.06±0.48	0.00	0.001
Sex (43)							
Male	3.15±0.37	3.28±0.53	0.13	3.04±0.46	3.08±0.50	0.04	0.151
Female	3.04±0.48	3.26±0.46	0.22*	3.07±0.48	3.05±0.48	-0.02	0.001
Age group (43)							
15-19	2.90±0.49	3.28±0.34	0.38*	2.96±0.50	3.00±0.53	0.04	0.006
20-29	2.91±0.49	3.19±0.50	0.28	3.05±0.42	3.03±0.47	-0.02	0.264
30-39	3.15±0.51	3.27±0.48	0.12	3.32±0.44	3.18±0.42	-0.05	0.475
40-49	3.02±0.43	3.20±0.47	0.18†	3.23±0.35	3.24±0.36	0.01	0.826
50-55	3.23±0.37	3.32±0.58	0.09	3.33±0.47	3.27±0.36	-0.06	0.811
Education (43)							
Elementary school	3.02±0.43	3.26±0.54	0.24*	3.15±0.54	3.22±0.55	0.07	0.073
Middle school	3.16±0.44	3.30±0.39	0.14	3.02±0.44	3.03±0.43	0.01	0.003
High school	3.00±0.52	3.21±0.43	0.21	3.01±0.44	3.00±0.49	-0.01	0.451
College or University	3.18±0.23	3.78±0.10	0.60	3.13±0.50	3.02±0.48	-0.11	0.017

* p-value of paired t-test of comparison between pre- and post-test capacity scores <0.01, †p-value<0.05.

Table 5. Capacity changes pre- to post-test changes in total score according to demographic factors

Capacity feathers	Intervention group (n=134)			Control group (n=149)			p-value
	Pre-test (mean ±SD)	Post-test (mean ±SD)	Changes	Pre-test (mean ±SD)	Post-test (mean ±SD)	Changes	
Knowledge	3.21±0.53	3.41±0.52	0.20*	3.27±0.48	3.29±0.47	0.02	0.049
Skill	2.92±0.61	3.15±0.57	0.23*	2.82±0.67	2.78±0.65	-0.04	0.000
Commitment	3.20±0.51	3.37±0.59	0.17*	3.35±0.47	3.37±0.47	0.02	0.975
Resources	2.91±0.58	3.10±0.68	0.19*	2.79±0.67	2.80±0.71	0.01	0.001

* p-value of paired t-test of comparisons between pre- and post scores<0.001.

factors on capacity. All statistical data was obtained using SPSS ver. 17.0K (SPSS Inc., Chicago, IL, USA)

RESULTS

The demographic characteristics of the participants is shown in Table 3. The intervention group consists of 134 leaders from 25 barangays who signed up for the village health worker training program. The majority of the group (114 participants, 85.1%) are female. The average age is 28.9. The 40s age group includes most subjects (36 participants, 27.1%), followed by the 30s group (30 participants, 22.6%), 50s group (28 participants, 21.0%), 10s group (23 participants, 17.3%) and 20s group (16 participants, 12.0%). In terms of education, 60 participants (46.1%) completed 5-year primary courses, 45 participants (34.6%) secondary courses, 23 participants (17.7%) pre-college courses and 2 participants (1.5%) college courses.

The control group is also female dominant

(104 participants, 69.8%). The number of participants seems to be inversely proportional to the age; 10s age group involves 63 participants (42.9%) 20s group 42 participants, (28.6%), 30s group 20 participants (13.4%), 40s group 14 participants (9.5%) and 50s group 8 participants (5.4%). The pre-college level includes most participants (60, 41.7%), followed by the secondary level (47, 32.6%), primary level (27, 18.8%) and lastly college level (10, 6.9%)

The total health promotion capacity of the intervention group exhibits 0.19 points difference between the pre- (3.06±0.46) and post-assessments (3.25±0.48; p=0.000), whereas no significant difference is found between the pre- (3.06±0.46) and post-assessments (3.06±0.48) in control group. The difference in the average total between the pre- and post-assessments measures 0.13 (pre 3.15±0.37, post 3.28±0.53) in the male group (p=0.252) and 0.22 in the female group (pre 3.04±0.48, post 3.26±0.46; p=0.000) in intervention group. The male and female

groups in the control group show 0.04 point increase and 0.02 point decrease in the average total.

The test by age shows that the 15-19 age group exhibits the biggest difference 0.38 (pre 2.90±0.49, post 3.28±0.34; p=0.005), followed by the 20s age group (pre 2.91±0.49, post 3.19±0.50; p=0.113), the 30s age group (pre 3.15±0.51, post 3.27±0.48; p=0.251), the 40s group (pre 3.02±0.43, post 3.20±0.47; p=0.043) and the 50-55 group (pre 3.23±0.37, post 3.32±0.58; p=0.453). No significant difference was found by age in the control group.

The test on the average difference between the pre- and post-assessment by educational level shows that the biggest difference 0.60 (pre 3.18±0.23, post 3.78±0.10) is achieved in the college level group, but no statistical test was undertaken because the number of subjects is only 2. The second biggest difference 0.24 was found in the primary level group (pre 3.02±0.43, post 3.26±0.54; p=0.004), followed by 0.21 in the pre-college level group (pre 3.00±0.52, post 3.21±0.43; p=0.081) and 0.14 in the secondary level group (pre 3.16±0.44, post 3.30±0.39; p=0.091). No significant difference was found by education in the control group.

The test on the average difference between the pre- and post-assessment in each capacity feather suggests that the biggest difference 0.23 is obtained in ‘Skill’ capacity (pre 2.92±0.61, post 3.15±0.57; p=0.001), followed by 0.20 in ‘Knowledge’ (pre 3.21±0.53, post 3.41±0.52; p=0.02), 0.19 in ‘Resource’ (pre 2.91±0.58, post 3.10±0.68; p=0.06) and 0.17 in ‘Commitment’ (pre 2.91±0.58; post 3.10±0.68; p=0.006). No feather shows a significant difference between the pre- and post-assessments in the control group. The total capacity and the three capacity feathers other than ‘Commitment’ exhibit significant average difference between the intervention and control groups (Tables 4, 5).

The multiple regression whose dependent

variables are the average differences in the feathers between the pre- and post-assessments and independent variables are the demographic factors showed no significant correlation with any demographic factor. The multiple regression with the average differences between the intervention and control groups as the independent variables shows no significant correlation with any demographic factor ($p>0.05$).

The satisfaction survey on the program participants shows high score on the program preparation including venue, textbook and schedule (4.23 ± 0.106). The participants are overall satisfied with the topics and contents of the program (4.33 ± 0.089) and the teaching methods and procedures (4.59 ± 0.065). The overall satisfaction with the training program is found to be high (4.40 ± 0.068) (Figure 1). Table 6 shows the qualitative assessment results using open-ended questions about the benefits from the program and constructive suggestions for it. Upon the question ‘what did you learn through the village health worker training program’, the majority of the participants answered that they learned the importance of the hygienic environment, knowledge and skills for maintaining the village environment clean and the necessity of physical and social collaboration to promote the health of their families and communities.

Most answered benefit of the program is that they could share useful knowledge and experiences as group discussion and presentation helped them to figure out the problems of their communities and the possible solutions. The participants also found the program useful because they learned the influential factors on both personal and community-wide health and the corresponding actions through the program.

The suggestions include updating the teaching materials to be suitable of self-study, supplying primary medicines and tools to the villages and expand the program so that more people can enroll.

Table 6. Qualitative evaluation of the village health worker training program

<p>What did you learn from the Village Health Worker Short Course?</p> <p>I learned about the characteristics of a healthy community, community health issues, protecting the water source, waste management, etc.</p> <p>I learned how to respect the environment and take care of myself, my family, my neighbor, and my community as a whole.</p> <p>I learned how to working together with the community for healthy living</p> <p>Proper hygiene and sanitation gave us more knowledge about health improvement</p> <p>I learned about proper ways to prevents diseases/illnesses.</p> <p>I learned how to make restrooms appropriately with a low cost budget.</p> <p>I learned the importance and ways of maintaining the cleanliness of the surroundings/environment for our health through awareness and discipline.</p>
<p>What was most helpful about the Village Health Worker Short Course?</p> <p>I became aware of the condition and how to solve the problems of my own villages.</p> <p>I really enjoyed when testimonies were given from the different experiences of some village health workers.</p> <p>The open forum where group discussions were made, suggestions/ideas were given, and questions were asked and answered was also very informative. Participating through the discussions made the lessons more relevant and retentive.</p> <p>I really enjoyed the way they taught us. Their teaching method was effective, fun and interesting at the same time.</p> <p>Everything that I learned in this short course was very helpful, practical, and gave me more knowledge about being a village health worker even without going to a school. I am very excited to go back and share this to my own community.</p> <p>I realized that all members of the village are God’s stewards and I was entrusted the task to take care, cultivate and preserve our environment even my own health.</p> <p>The seminar encouraged us to be involved with my own villages so I can make a Christian influence and difference to my own communities.</p>
<p>What improvements can you suggest for the Village Health Worker Short Course?</p> <p>Additional activities about health care activities.</p> <p>Provide more manuals/documents as references for future self-study.</p> <p>I am very satisfied with this short seminar so conduct more in the future</p> <p>Provide more equipment and facilities.</p> <p>An additional day or more for a practical presentation/application of the lectures</p> <p>If it is possible, please give free medicine for the health workers and health centers.</p>

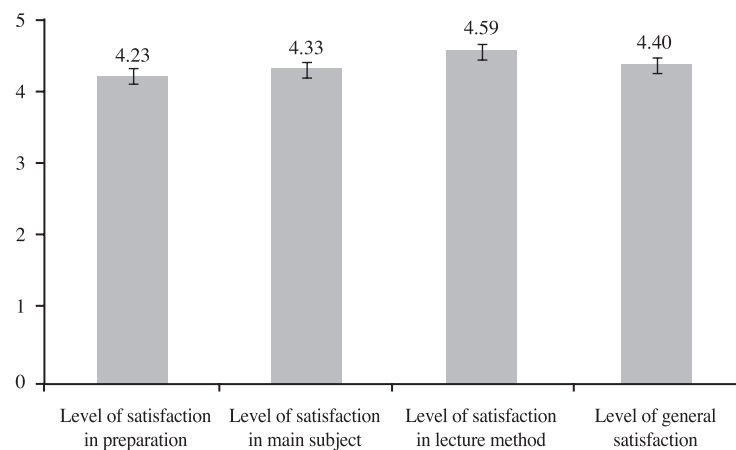


Figure 1. Level of satisfaction for preparation, selection of main subject and lecture method of village health worker training program.

DISCUSSION

A number of studies previously reported the effects of short-term health training programs on the knowledge, attitude and practice of the participants. The 5-day training program tested in a Vietnamese village was found to be significant in improving the health and hygiene related knowledge and skills of the community leaders in comparison with the control group

[30]. Gilberte et al. [31] suggested that the level of knowledge, attitude and practice for skin cancer prevention were actually enhanced by the short-term program, which was demonstrated by the follow-up assessment 5 months after the intervention. Nishiuchi et al. [32] evaluated the variations in the knowledge and practice of the managers as a result of the 1-day training for stress relief by means of the pre-, post- and 5 month follow-up assessments.

Nonake et al. [33] tested the effects of the 1-day Malaria prevention program on the trainees' knowledge, attitude and practice. Those studies demonstrated the positive effects of short-term educational program. Following the results of the previous studies, this study is aimed at developing a short-term village health worker training program suitable for the regional circumstances of low developed countries, operating it and assessing the influential factors. The results suggest that the village health worker training program tested in this study is effective to some extent and may provide preliminary data for the development of new approaches to improving the health standard of local residents of low developed countries.

The comparison between the pre- and post-assessments showed that the participants exhibit significant increases in both sum and individual capacities in all feathers. It was also found that the control group is significantly distinguished from the intervention group in all capacity feathers except 'Commitment'. It is thought that such improvements largely have to do with the newly designed participant-driven program based on the 'Adult learning principles' [30], avoiding inefficient and unidirectional teaching methods. In fact, the open-ended survey on the benefits from the tested village health worker training program confirmed that the majority of the participants found it interesting to participate in such discussion-based program. On the basis of the new public health approach to the program topics, the program covered a number of urgent health issues that the local communities have to deal with, for example, the top 10 causes of death in the Philippines, emphasized the importance of hygiene in human life and suggested possible preventions and protective measures, which presumably motivated the participants a lot. The clue to the little difference between the intervention and control groups in 'Commitment' capacity may be found in the previous studies. According to the

studies, short-term training and education programs resulted in the growth of knowledge and skills for disease prevention and health care and relatively simple protective measures against specific diseases such as malaria [33] and skin cancer [31] were well observed. Even in those studies, however, no or little improvement was achieved in activities requiring extensive reform, for example, water quality improvement [34] and workplace improvement [32]. The small difference between the pre- and post-assessments in 'Commitment' capacity in this study can be viewed in this respect.

The main contribution of this study is that the conventional training program has been extended to tackle the health problem in hand that most low developed countries are seriously suffering based on the new public health principles. The proposed program was designed such that it helps both health promotion and disease prevention. The post-assessment on the participants exhibited significant improvement in all assessment feathers except 'Commitment' compared to the pre-assessment. The validity of this program was supported by the open-ended survey on the benefits from the tested village health worker training program showing high scores across many decisive factors from personal and environmental aspects to social and cultural levels.

As the participants' health promotion capacity is found to be significantly enhanced and no outstanding difficulty is observed with respect to operating the program, the subject selection based on the previous study [35] is thought to be suitable for this study. The demographical analysis shows that the difference in health promotion capacity between the pre- and post-assessments becomes clearer as the education level and age goes down. This finding is not consistent with the Hien et al.'s study [30] showing that higher health promotion capacity is achieved by well-educated classes such as teachers, local

activists and officials. One possible argument is that the difference in education levels does not appear to be predominant because the studied area is geographically isolated and therefore the education quality and period still remain low. The possibility of translation error with respect to the assessment tool may not be ruled out. Further works are to be done to investigate the validity of the assessment tool.

A significant difference was found in 'Commitment' on average between the pre and post assessment of the intervention group, but the comparison between the intervention and control groups shows no significant difference. The 'Commitment' is evaluated by the activeness, attitude and practice towards the tested program. In fact, the portion of urban residents in the control group is greater than that in the intervention group and the demographic fact of the control group features lower ages and higher education levels, which may lead to higher 'Commitment' levels. In addition to that, the control group involves twice as many male participants as the intervention group. Taking the male dominant culture of the local village into consideration, the higher number of male participants should have affected the 'Commitment' capacity. Most importantly, 'Commitment' aspects cannot be dramatically improved by a short-term program and therefore the single dimensional assessment method used in this study is not practical enough. Although a significant difference was found in the intervention group, the result should be further validated by a series of follow-up assessments, i.e. time-series assessment.

The results of this study should not be interpreted as a generalized result valid in any low developed countries since the data was obtained from a limited local area of the Philippines. As far as the participants are concerned, the intervention and control groups are not from the same area in the presence of non-uniformity in the demography, e.g. gender, age, education level, etc, which may affect the

results to some extent. In terms of methodology, the results are not 100 % free from the risk of bias arising from the methodological errors because no preliminary study was taken to prove the validity of the four feathers examined in this study. Another limitation is that the efficiency of the proposed program cannot simply be compared with that of the conventional approaches in a way that compares the difference in the basic capacities between the intervention and control groups. However, this study suggests an initial approach to avoiding the repeated problems arising from the typical diseases such that a new village health worker training program is introduced and the consequent improvement in the health promotion capacity is qualitatively assessed. This study can be used as a preliminary work for establishing the guideline as to the requests for international health aid. Further works are needed to validate the assessment tool, establish the manual for selecting subjects and develop a follow-up assessment protocol.

The main contribution of this study is that it is an initial attempt to develop a short-term village health worker training program applicable to low developed countries based on the new public health principles and assess the health promotion capacity of the participants extensively. The scope of the previous studies regarding village health workers was limited to the development and monitoring of training programs. Both qualitative and quantitative results of this study suggest that the proposed village health worker training program tested in Tuguegarao, the Philippines has positive effects on the health promotion capacity. It is rather premature to conclude that the findings presented in this study can be universally valid in the whole Philippines or other low developed countries. Further works are to be extensively undertaken across a greater number of subjects and countries and the validity, reliability and demographic dependency of the program will be further investigate. A better

understanding of the results may provide efficient guideline upon request of economic aid for low developed countries.

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Appendix 1. Timetable of village health worker training program

Time	Schedule	Remark
1st day (10:00-15:00, Tue., Jan. 27, 2009)		
Session I	Orientation and pre-test Lecture 1. Roles of village health workers Discussion 1. How can be a good VHW? Presentation time 1	Questionnaire
Session II	Lecture 2. Understanding of new public health principles Discussion 2. Application of NPH principles in our barangay Presentation time 2	Checklist
2nd day (9:00-17:00, Wed., Jan. 28, 2009)		
Session III	Lecture 3. Management of acute disease 'Water source development and protection' Discussion 3. Make our water supply healthier Presentation time 3	Checklist
Session IV	Lecture 4. Management of acute disease 'Water treatment and waste dispose' Discussion 4. Let' s make a clean & healthy barangay Presentation time 4	Checklist
Session V	Lecture 5. Management of chronic disease 'Prevalence pattern of chronic disease in Philippine' Discussion 5. How to reduce prevalence pattern of chronic disease Presentation time 5	
3rd day (9:00-14:00, Thr., Jan. 29, 2009)		
Session VI	Lecture 6. Understanding of determinants of health and socio ecological model of health Summing up presentation Closing remark Post-test Graduation ceremony	Questionnaire