

Development of the training program on retooling *barangay* health workers in Occidental Mindoro, Philippines

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Abstract. Community Health Workers (CHWs), known as *Barangay* Health Workers (BHWs) in the Philippines, are essential in connecting remote communities with healthcare services, yet they face challenges such as limited training and resources. This study developed and evaluated a comprehensive training program to enhance BHW capabilities in Occidental Mindoro, Philippines. Using a quasi-experimental, one-group pretest-post-test design with qualitative validation, BHWs were recruited through purposive sampling. A needs assessment informed the program, and pre- and post-training assessments measured changes in knowledge, skills, and attitudes. Results showed significant improvements, highlighting the value of ongoing training in boosting BHWs' effectiveness in community health. This program offers a model for strengthening healthcare delivery in underserved regions.

Keywords: *barangay* health workers, community health workers, extension, training program, project monitoring

Introduction

Community Health Workers (CHWs), also known as "Barangay Health Workers" (BHW) in the Philippines, have completed training programs with authorized government and non-government organizations. *Barangay* is the lowest political administrative unit of the Philippine government. Together with the municipal and provincial government, the barangay is considered the fundamental base of the Philippine national government (Porio & Roque-Sarmiento 2019). They voluntarily supply primary health care services to the community after being recognized by the local health board by the Department of Health (DOH). BHW are organized and recognized under Republic Act 7883: The *Barangay* Health Workers' Benefits and Incentives Act of 1995. 'The government and all its instrumentalities shall also recognize the rights of *barangay* health workers to organize themselves, to strengthen and systematize their services to their community; and to make a venue for sharing their experiences and for recommending policies and guidelines for the promotion, maintenance and advancement of their activities and services' (Republic Act No. 7883 n.d.).

Barangay Health Workers (BHWs) play a vital role in the Philippine healthcare system, bridging rural communities and formal healthcare services. Their presence is important, especially in geographically isolated and disadvantaged areas where there is limited access to health services (Mallari et al. 2020). BHWs play a pivotal role in providing health education, promoting preventive measures, facilitating maternal and childcare, assisting in immunizations, and offering immediate assistance during emergencies (Van Den Berg et al. 2012; Sy et al. 2019; Kanamori et al. 2021). This participation at the grassroots level enables BHWs to recognize health issues at their beginning, allowing for early intervention and developing positive health-seeking behaviours within communities (Yamashita et al. 2015; Inobaya et al. 2018; Reyes et al. 2023).

Despite BHW's significant role in delivering health services, different problems limit their capacity and capability (Johnson et al. 2022). Many BHWs obtain minimal training but lack the in-depth knowledge and skills needed to manage complex health conditions. Continuous training and upskilling are essential for them to keep up with changing healthcare practices (Siongco et al. 2021). Addressing these issues through comprehensive training, proper compensation, resource allocation, integrated healthcare systems, fair distribution, and enhanced data management can result in a stronger and more efficient healthcare delivery system at the grassroots level. Recognizing and empowering BHWs may substantially impact general health and well-being especially in the Philippines (Ballard et al. 2020; Dodd et al. 2021).

The study's conceptual framework is grounded in two key theories: Adult Learning Theory and Kirkpatrick's Four Levels of Training Evaluation. Adult Learning Theory posits that adults learn most effectively when they are actively engaged in the learning process, when the content is relevant to their needs, and when they can immediately apply what they've learned to their work (Merriam 2018). Kirkpatrick's model, on the other hand, offers a structured approach to evaluate training programs at four levels: reaction, learning, behaviour, and results (Kirkpatrick & Kirkpatrick 2013).

By incorporating these theories, this study aimed to develop and evaluate a comprehensive training program to enhance the knowledge, skills, and attitudes of Barangay Health Workers (BHWs) in selected municipalities of Occidental Mindoro, thereby improving their capacity to deliver effective primary healthcare services to their communities. This aim encompasses the following specific objectives: (1) identify the specific training needs of BHWs in the target area through a thorough needs assessment; (2) develop a comprehensive training curriculum aligned with the identified needs, incorporating a mix of theoretical knowledge and practical skills; (3) deliver the training program effectively, utilizing appropriate teaching methodologies and engaging BHWs in active learning; (4) assess the impact of the training program on BHWs' knowledge, skills, attitudes, and their subsequent practice.

Materials and methods

Research design

This study used a quasi-experimental, one group pretest-post-test design with a qualitative validation approach (Stroud et al. 2020). The quantitative component measured changes in knowledge, skills, and attitudes before and after training. The qualitative component gathered insights into participants' training experiences and perceptions of program effectiveness. The program has five phases: conceptualization; development; execution; and monitoring and evaluation.

Prior to the conceptualization of the training program, a training needs assessment (TNA) with competency gap analysis was carried out to tailor-fit each module to the needs of the stakeholders (Gupta 2011). This TNA identified specific skill areas and competencies of the *barangay* health workers. The questionnaire for the training needs assessment was divided into five sections: (1) the demographic profile (2) BHW orientation and interpersonal relationship; (3) primary health care services in the community; (4) safe motherhood and women's health; and (5) child's health. *Barangay* health workers were asked to rate their competency level for each core and functional competency using a five-point Likert Scale from 5 (highly needed) to 1 (least likely needed). Further, the questionnaire included closed-ended questions to specify training needs that were not covered in the scale including preferred training, mode of delivery, and learning strategies

The development phase included developing the training design, presenting and receiving feedback on the design, developing the training materials, and finishing the training package. This also included gaining acceptance of the program, specifying tasks, estimating resource needs, developing specific plans for program activities, and establishing a mechanism for program management (Dignan & Carr 1992).

The *barangay* health workers' training was undertaken based on action plans were approved by the local officials from the municipal health units and the Extension and Technical Advisory Services of the Occidental Mindoro State College. The training was implemented bi-annually or based on the request of the municipal health units if changes were necessary. As an overview, the program included several processes: registration, pre-test, course implementation, post-test, and program evaluation.

Process monitoring and evaluation were undertaken in the early stages of a project with the primary aim of tracking the use of resources and looking at how activities and outputs were carried out. The program evaluation also utilised a participatory evaluation approach. Activities included a pre-training and post-training assessment; satisfaction and feedback evaluations after each training period; and a short follow-up interview. Participant knowledge was assessed by examining their workshop outputs (relevant to most modules) and by conducting both pre-and post-tests. Participant data was identified only by codes to match their pre-and post-test scores. It was aggregated and examined in Microsoft Excel. To analyse changes in scores from pre- to post-test, the researcher used a one-tailed paired t-test, testing the hypothesis that scores would significantly improve following the intervention. The significance level was set at 0.05 to determine if the observed increase in scores was statistically meaningful.

Data collection techniques and tools

Knowledge, skills and attitudes measured before and after training using structured assessments. Questionnaires were based on primary healthcare competencies for community health workers, with additional attitude-based questions.

Population, participants, and sampling

The study was conducted in the Municipality of Rizal, Occidental Mindoro, Philippines. BHWs involved in primary healthcare delivery within the local government health system were the participants of the program. The study targeted BHWs who had not received recent training in

core competencies to ensure they had baseline skills. A purposive sampling approach was used to select BHWs from various *barangays* within the community.

Results

The participants of the study

There were three training program batches. Batch 1, held on May 23, 2018, had 70 attendees. Batch 2 followed on April 22, 2019, with 22 participants. The most recent batch, Batch 3, took place on May 19, 2022, and drew 89 participants. In total, 223 *barangay* health workers attended the training program from different municipalities of Rizal, Occidental Mindoro.

Validation of training needs

The BHWs had high training needs on basic BHW domiciliary functions and interpersonal relationships (mean=4.27), primary health care services in the community (mean=4.49), safe motherhood and women's health (mean=4.49), and child's health (mean=4.58) (Table 1). The findings indicate that BHWs place a significant emphasis on maintaining accurate records and reports, providing crucial primary health care services, and focusing on maternal, women, and child health. Given the high average score for child health, this topic was applicable to the content of each module. This data underscores the importance of tailoring training programs to address these specific areas of importance to the BHWs and the communities they serve.

Representatives of rural health units (municipal health officer, public health nurses, rural health midwives) met with Occidental Mindoro State College – Midwifery Department faculty to discuss and validate the results of the training needs analysis and to tailor a training course based on the findings. Participants in the validation meeting expressed a preference for training that lasted two to three days and took place in the municipal hall. They also chose a staggered, modular, pedagogical structure that would allow for plenty of time for experience-sharing of the necessary skills. Preferred methods of assessment were role-playing, demonstrations, and workshops. A monitoring and evaluation tool was recommended to be included in the module. It was agreed upon at this consultative meeting that personnel would undergo training for all the priority competency areas to be covered for the engagement.

These plans outlined the goals of individual employees with respect to their learning and development, as well as corresponding activities and timelines to support the achievement of these goals. Engagement of *barangay* health workers was prioritised for two reasons: (a) they were volunteer *barangay* health workers who needed training for accreditation, and (b) accredited *barangay* health workers who need trainings for their re-accreditation.

Learning objectives and module development

The priority competency areas for training were the competencies in which gaps between the expected and perceived level of performance for technical staff across all salary grades were highest: maintaining records and making reports; sanitation and hygiene; child's nutrition; expanded program on immunization; and growth monitoring and promotion. These were the bases for the selection and development of modules, which were formulated from October 2017 to December 2017, and validated in another consultative meeting in March 2018 in the Municipal Health Office and Mayor's Office of Rizal, Occidental Mindoro, Philippines.

After determining that there was a legitimate training need, the next step was to state exactly what the training was to accomplish. The stakeholders set the learning objective and stated that "at the end of the training, *barangay* health workers will have acquired the knowledge, skills, and attitudes necessary to effectively provide primary healthcare services, promote community health, and assist in health education activities within their respective *barangays*".

Training implementation

The implementation phase was initiated following approval from local officials. The project team, in collaboration with the municipal health office, strategically grouped modules that were perceived to have logical connections or were built upon each other in terms of competencies. In other words, one competency within a particular area was considered a prerequisite for mastering another. This resulted in five module groups: (1) The BHW and the community; (2) BHW and family health care; (3) BHW and common illnesses in the community; (4) BHW and first aid; and (5) proper measurement of vital signs. To cater to the diverse linguistic needs of the trainees, the training modules were presented in both Filipino (*Tagalog*) and English.

Table 1. Training needs of the *barangay* health workers

Areas of training and development	Mean
<i>I. BHW orientation and interpersonal relationship</i>	
Inputting data into written records	4.46
Establishing a relationship with patients	4.41
Communicating with patients face-to-face	4.32
Working as a member of a team	4.32
Undertaking health promotion and prevention activities	4.30
Giving information to patients and/or carers	4.27
Making appropriate patient referrals	4.25
Prioritizing your work according to patient's needs	4.22
Categorizing for admission and termination	4.18
Evaluating patients' psychological and social needs	4.18
Developing joint work arrangements with others	4.18
Taking technical treatment procedures	4.10
Weighted Mean	4.27
<i>II. Primary health care services in the community</i>	
Maintaining records and making reports	4.66
First aid	4.55
Assisting in health centre activities	4.52
Assessment of Vital signs (BP, T, P, R)	4.50
Anthropometric measurement (height, weight, MUAC)	4.49
Collecting vital statistics	4.40
Equipment sterilization	4.30
Weighted Mean	4.49
<i>III. Safe motherhood and women's health</i>	
Care during pregnancy	4.56
Family planning	4.51
Care during post-partum	4.41
Sexually transmitted diseases	4.32
Adolescent fertility	4.29
Healthy lifestyle	4.29
Weighted Mean	4.40
<i>IV. Child's health</i>	
Sanitation and hygiene	4.64
Nutrition for children	4.63
Expanded program on immunization	4.58
Growth monitoring and promotion	4.56
Integrated management of childhood illnesses	4.55
Control of diarrheal disease	4.51
Weighted Mean	4.58

*The higher the mean score, the higher the training needs.

With a total training duration of 28 hours, the training modules for *Barangay* Health Workers (BHWs) covered a wide range of essential topics and objectives aimed at equipping them with the knowledge and skills needed for effective community healthcare. From understanding their roles and responsibilities to addressing common illnesses and providing vital health services, the modules employed a variety of teaching strategies, including active lectures, role-playing, practical demonstrations, and interactive workshops. These diverse approaches aimed to ensure that BHWs not only grasped theoretical concepts but also able to address community health needs. They can effectively identify health priorities, mobilize communities, and provide essential health services. By applying the knowledge and skills gained from the training, BHWs can significantly improve the health and well-being of the community.

The training was held bi-annually or based on requests from municipal health units if adjustments were necessary. The program activities during this phase typically followed a structured process that included registration, pre-test assessments, course delivery, post-test assessments, and program evaluation. While the project team began with a standard training module, the training sessions were still tailored to suit the specific composition of the training participants. The project team made these determinations on the first day of training, and in some cases, a day prior. If

the training team assessed that participant had more experience in a certain area or received feedback that they already possessed certain skills learned in related training sessions conducted between the Training Needs Assessment (TNA) and the current activity, some sessions outlined in the module were omitted. Each daily session followed a structured format, commencing with setting expectations in the morning. The main program included various activities specific to each module. Finally, the day concluded with participants completing an evaluation form to assess the content and organization of the workshop.

Training output

Three training courses were conducted from May 2018 to May 2022 and were attended by 223 participants. Other trainings implemented included a portion of the modules requested by the stakeholders. Other activities were conducted through short webinars. This flexibility allowed for a tailored learning experience based on the skills and competencies already possessed by the participants. Sessions that were deemed redundant or unnecessary due to participants' prior knowledge were skipped, optimizing the use of training time and resources.

Furthermore, the daily structure of the training sessions, which began with expectations setting and concluded with participant evaluations, emphasized the importance of a well-organized and participant-centred approach. This approach ensures that the training content aligns with the expectations and needs of the professional audience, ultimately contributing to a more effective and efficient training program. In summary, this adaptable and participant-focused training approach underscores the project team's commitment to providing a customized and impactful learning experience for the target audience, enhancing the overall quality of the training output.

Training evaluation

Table 2 contains the mean scores with standard deviations for various parameters evaluated across three different training batches and an overall average. The results indicate that, on average, participants across all batches found the training to be highly effective, with the overall satisfaction rating being 4.69 ± 0.12 , demonstrating a very satisfactory response. Notably, participants rated the knowledgeable trainer very satisfactory, with a score of 4.85 ± 0.11 , indicating a strong perception of the trainer's expertise. Additionally, the attainment of objectives received a very satisfactory score of 4.85 ± 0.14 , suggesting that participants felt they achieved the intended learning outcomes. The quality and relevance of the training materials were also well-received, with a very satisfactory score of 4.79 ± 0.18 . While some parameters like content organization and timeliness of the training received slightly lower scores, overall, the training was considered highly satisfactory, meeting or exceeding participants' expectations in all key aspects.

Table 2. Ratings for evaluation of each batch of training

Parameters	Mean (SD)			
	Batch 1	Batch 2	Batch 3	Overall
Training expectations	4.71 ± 0.46	4.55 ± 0.80	4.51 ± 0.59	4.59 ± 0.11
Application of learned knowledge	4.87 ± 0.34	4.77 ± 0.53	4.57 ± 0.54	4.74 ± 0.15
Clarity of objectives	4.60 ± 0.56	4.86 ± 0.47	4.34 ± 0.98	4.60 ± 0.26
Content organization	4.62 ± 0.52	4.73 ± 0.55	4.51 ± 0.81	4.62 ± 0.11
Relevance of materials	4.40 ± 0.61	4.68 ± 0.89	4.57 ± 0.56	4.55 ± 0.14
Knowledgeable trainer	4.97 ± 0.18	4.82 ± 0.59	4.76 ± 0.45	4.85 ± 0.11
Attainment of objectives	4.92 ± 0.27	4.95 ± 0.21	4.69 ± 0.49	4.85 ± 0.14
Participation, and interaction	4.68 ± 0.47	4.77 ± 0.43	4.57 ± 0.54	4.67 ± 0.10
Adequacy of time for discussion	4.79 ± 0.41	4.91 ± 0.29	4.45 ± 0.81	4.72 ± 0.24
Timeliness of the training	4.73 ± 0.45	4.82 ± 0.40	4.56 ± 0.54	4.70 ± 0.13
Food served	4.71 ± 0.46	4.86 ± 0.35	4.48 ± 0.68	4.68 ± 0.19
Appropriateness of the venue	4.30 ± 0.61	4.86 ± 0.47	4.70 ± 0.49	4.62 ± 0.29
Quality and relevance	4.71 ± 0.46	5.00 ± 0.00	4.67 ± 0.80	4.79 ± 0.18
Overall	4.70 ± 0.30	4.81 ± 0.41	4.57 ± 0.59	4.69 ± 0.12

Scale: 1.00-1.79 Very Dissatisfactory; 1.80-2.59 Dissatisfactory; 2.60-3.39 Moderate; 3.40-4.19 Satisfactory; 4.20-5.00 Very satisfactory

Evaluation of learning

The findings of pre-test and post-test scores for three different training batches, along with the associated p-values are presented in Table 3. In Batch 1 (n=70), participants' mean pre-test score was 8.36 ± 1.73 , which significantly improved to 12.03 ± 1.83 in the post-test (p-value <0.001). Similarly, in Batch 2 (n=22), the mean pre-test score was 7.50 ± 1.41 , and it significantly increased to 12.73 ± 1.78 in the post-test (p-value <0.001). Batch 3 (n=89) had a larger number of test items (25), and participants exhibited a mean pre-test score of $23.46 \pm$

1.87, which also significantly improved to 24.24 ± 0.88 in the post-test (p -value <0.001). These results indicate that the training had a significant positive effect on participants' knowledge and understanding across all three batches, with substantial improvements demonstrated by the statistically significant p -values.

Table 3. Pre- and post-test scores for each trained batch.

Batch	Test items	Pre-test scores	Post-test scores	p-value
		mean (SD)	mean (SD)	
Batch 1 (n = 70)	15	8.36 ± 1.73	12.03 ± 1.83	<0.001
Batch 2 (n=22)	15	7.50 ± 1.41	12.73 ± 1.78	<0.001
Batch 3 (n=89)	25	23.46 ± 1.87	24.24 ± 0.88	<0.001

Discussion

This project has demonstrated the effectiveness of professional health educators in the target community. The lecturers and trainers were able to provide the *barangay* health workers with knowledge and support so that they felt prepared to assume leadership roles and skills in conducting health services within their community. This was reflected in their training evaluation and their pre-and post-test which are indications of the success of the training program.

The *barangay* health workers gained their knowledge, skills and attitudes through pre-service education, in-service training and work experience. Ongoing training in an appropriate training environment may motivate, *barangay* health workers to serve their local communities (Glanz et al. 2008; Javanparast et al. 2018; O'Donovan et al. 2018). The environment, trainer's knowledge, relationship, and rules of the training were important in the acquisition of knowledge. Training in the locality of the *barangay* health workers builds strong relationships and closer supervision and assessment (Javanparast et al. 2012).

The project demonstrated a favourable improvement of the *barangay* health worker's understanding suggesting the training was effective. This demonstrates that *barangay* health workers can be trained effectively for maternal and child health, primary healthcare, and basic assessment skills necessary for prevention and management of community health. The knowledge and skills set of *barangay* health workers improved in the post-test for all batches of training. Training sessions adapted to the needs of the community and delivered in the local language were significant to the activity. Since assessment and prevention includes basic knowledge and skills (i.e. taking blood pressure, pulse rate monitoring, respiratory rate monitoring, temperature taking, height, and weight, performing of basic life support), responding to the training needs of the community and collaborating with them was an essential component to deliver the training to *barangay* health workers. The result of this study corroborates the findings of (Kalluru et al. 2023) which state that there is a need for standardized training to ensure that community health workers have the fundamental knowledge and skills to meet the needs of the community and to function as the front line of health promotion and advocacy, especially for marginalized populations.

Notwithstanding the baseline knowledge and skills of the trained *barangay* health workers, most of the post-training knowledge scores were high. While the focus of this paper was knowledge change, results from various studies have demonstrated the effectiveness of training for *barangay* health workers. The training on determinants of health including social factors was effective in improving village health worker's understanding (Kim et al. 2009). Nonaka et al. (2008) proved the effects of the Malaria prevention program on the trainee's knowledge, attitude, and practice. In addition, Community Health Workers can be trained effectively for cardiovascular disease prevention and management (Abdel-All et al. 2017). Furthermore, a basic life support seminar proved its effectiveness in increasing the level of knowledge among the BHWs, which showed an evident difference in scores from low level to high level (Monsale et al. 2019). Those studies demonstrated the positive effects of educational and training programs. The results suggest that the *barangay* health worker training program tested in this study was effective and may provide preliminary data for the development of new approaches and areas of improvement for future programs.

Regardless of the trainings received by the *barangay* health workers, it appears that *barangay* health workers in low-middle-income countries can effectively support various primary healthcare programs targeting non-communicable diseases (Jeet et al. 2018). *Barangay* health workers present a promising opportunity to improve the equity of access to primary health care for communities that experience disadvantage and marginalization, improve education and community development, and help address the challenges of a lack of qualified workers, rising healthcare demand, and the burden of chronic and complex health conditions. These challenges

can be met with a stronger evidence base and thoughtful policy development (Javanparast et al. 2012). Community Health Workers can be crucial in enhancing health systems to deliver comprehensive, egalitarian, and people-centred care that is both culturally acceptable and financially feasible (World Health Organization 2008).

Conclusion

The training program demonstrated a responsive and participant-centric approach to community health development. By tailoring training sessions to match the unique composition and prior knowledge of the participants, the project team ensured that the learning experience was both efficient and effective. This adaptive approach allowed for the optimisation of training resources while addressing the specific needs of the stakeholders. Moreover, the structured daily format, which included expectation setting and participant feedback, underscored the commitment to delivering a well-organised and participant-centred program.

Ultimately, this approach not only enhances the quality of the training output but also highlights the importance of flexibility and responsiveness in designing training programs for diverse and dynamic professional audiences. By recognizing the individual strengths and knowledge gaps within the group, organisations can create training experiences that are more engaging, relevant, and impactful, ultimately contributing to the growth and development of their workforce.

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