Educating and Promoting Health - A Community-based Prevention and Control Program for Soil-Transmitted Helminth Infections in a Community in Rodriguez, Rizal

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ABSTRACT

The impact of soil-transmitted helminthiases on the overall health of an individual may lead to significant morbidity related to the number of worms harbored by the person. Light intensity infections usually present no significant effect on the individual except in times of more massive infections, in which complications may lead to impaired growth and physical development. With this, international and local health programs aim to increase the proportion of community households aware of proper helminthiases prevention and control strategies. Access to potable water, and drainage and disposal or reuse of household water, to safe and sanitary facilities, safe human excreta disposal, and proper management of solid waste appropriate information on prevention and treatment of soil-transmitted helminthiases (STH), and dissemination of key messages to promote safe water storage, hand washing, bathing practices, safe food handling, latrine use and wearing of shoes and regular deworming practices are recommended points of intervention to reduce the prevalence of helminthiases in children and other high-risk population groups. Guided with the principles of health promotion and education and the health program framework of the Department of Health (DOH) and World Health Organization (WHO), community health may be achieved equitably by leveraging accurate information, community mobilization, and sustainable health partnerships.

Key words Soil-Transmitted Helminths, Health Promotion, Health Education, Infectious Disease, Public Health

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INTRODUCTION

Soil-transmitted helminthiases (STH) including infections caused by *Ascaris lumbricoides*, *Trichuris trichiura* and intestinal hookworm remain a significant public health concern globally, especially among third world countries like the Philippines.[1] There is a high factorial risk among school-aged children that is attributed to individual factors such as poor personal hygiene and frequent exposure to outdoor

activities; behavioral factors, especially the poor health-seeking behavior of parents or guardians; environmental factors such as humidity, temperature, and cleanliness in the community; and accessibility and availability of health services.[1,2] The strategic plan of the World Health Organization (WHO) and the Integrated Helminth Control Program[3] (IHCP) of the DOH of implementing regular deworming of school-aged children, have highlighted the importance of strengthening preventive measures at the community level. One of the key preventive measures is demonstrated by the WASHED Framework of the Department of Health (DOH) by promoting good practices by educating the community of proper water, sanitation and hygiene.

In a specific community in Rodriguez Rizal, where most residents were relocated from several parts of Metro Manila, almost 30% of its population aged 10 and below are known to be vulnerable for STH infection.[4] A conclusive finding through community and risk assessment for infectious diseases has led to the creation of the community health program, health education and promotion project entitled *"Oplan BulateKNOW: Hawak kamay, hugas kamay, kapaligiran gawing dalisay upang ang bulate ay bye bye"*. It was created and conceptualized in order to address in a feasible manner the identified health problems by educating the community about the importance of proper sanitation and hygiene. The objective of the public health community program is to strengthen the implementation of community-based anti-helminth program through health education and promotion on clean water, sanitation, hygiene and deworming practices in a community in Rodriguez, Rizal.

METHODS

Infectious diseases topped morbidity cases among school-aged children in Rodriguez, Rizal according to the Municipal Health Office (MHO) health head physicians during an interview and consultation of community health indices. According to the MHO health report in 2012, gastroenteritis accounts for the majority of cases in the community which may have been caused by poor environmental indices and lack of proper education on how to prevent and respond to related infections.[4] Five problems were identified after consultation with the MHO staff and different sectors of the community. It was determined that the prevalence of acute gastroenteritis in the community of 1K Kasiglahan Village, Barangay San Jose, Rodriguez, Rizal was correlated with the unwillingness of children's parents in deworming programs of the DOH, DepEd, and the local government which may have contributed to cases of infection and reinfection of STHs in the community. Public health activities were directed on the identified community health problem by leveraging health promotion and education.

Several health promotion and education methodologies were mainstreamed in the community, namely 1) risk assessment; 2) consultative workshop; 3) information, education, communication development and distribution; 4) public health education lay forum; and 5) partnership and capacity development.

Risk Assessment

With the help of community leaders, the degree of vulnerability of the community to infectious disease was identified by conducting a risk assessment survey. This aims to assess the risk factors contributing to STHs in community members by surveying parents or guardians of children 14 years old and below. Each head of the household with school-aged children were surveyed. The survey was focused on understanding quality, quantity, accessibility and utilization of water in the community; their sanitation practices; history of helminth infection in the family; their health-seeking behavior towards STHs; and their participation in the deworming programs of the LGU, DOH and DepEd. The questions were formulated using literature reviews, epidemiological investigations, health surveillance and consultation with experts on STH epidemiological surveys.

Alongside the survey, stool examination was conducted. Each block in the community was represented by at least one school-aged child.

Consent forms from parents/guardians and stool samples were collected. Formalin Ethyl Acetate Concentration Technique was the method of analysis to check the presence or absence of any parasite in each participant. The program proponent forwarded a report of the stool analysis to the MHO and discussed its health recommendations.

Consultative Workshop

To increase mobilization of the community on preventive measures of STH, a consultative workshop was conducted. The 6.5-hour Consultative Workshop for Health Promotion was focused on building relationships among members and leaders of the community as well as highlighting benefits of closer collaboration and cooperation. Lecture and dialogue with community leaders, community health officers and barangay officials were conducted to discuss basic concepts of community leadership, the importance of health promotion and education and basic concepts of communicable diseases, in particular the STH.

Lectures on health promotion and concepts of communicable diseases will enkindle fundamental knowledge of the community so that people are deeply involved; hence, increasing their capacity to engage in the consultative workshop proper. Inputs of each stakeholder in the community were valuable to identify and prioritize health needs and address capacity gaps. The community leaders were tasked to identify contributing problems through the "but why" chart. They also created a complimentary chart containing proposed interventions based on inputs of initial lectures on this component.

IEC Development and Distribution

Information, education and communication (IEC) materials in Filipino language were created based on the National *Guidebook for Disease Prevention and Control Program for Soil-Transmitted Helminth Infections and Diarrheal Diseases* by the Department of Health.[3] This served as the primary reference in composing the content of IEC materials. Also, other educational materials from the WHO and Centers for Disease Control were also used to supplement the primary reference of the IECs. The creation and distribution of IEC materials in the community and health units aims to increase awareness in the prevention and control of STH in the community. The overall content of materials have considered the outcomes of risk assessment survey and consultative workshop in the community. IEC materials include the health plan logo, posters and flyers.

Before posting and distribution, the contents of IEC materials were validated by the MHO head physicians of Rodriguez, Rizal, its health officers, barangay officials and the health promotion task force in the community. The health leaders and program organizers assisted in posting and distribution of materials in the community.

Public Health Education Lay Forum

Public Health Education is a component of health education centered on improving health by developing, evaluating and implementing effective public health programs addressing inequalities in health. The target participants were children and parents or guardians. A minimum of 50 participants were enjoined to the lay forum. It was emphasized that children should be accompanied by their respective parents or guardians. Community members were invited by the project leads and assisted through initiatives of the OK KA KASIGLAHAN Health Promotion Task Force.

The lecture was intended to present information about STHs in order to increase the community knowledge on the nature of STH parasites and how preventive measures can provide effective protection from contracting the infection. It was subdivided into three – 1) STH epidemiology, nature of the parasite and its risk factors; 2) signs and symptoms among individuals infected with STH, and information on preventive and control measures for STH; and 3) the available health services for the prevention and control of STH. Lectures were discussed by a medical technologist and the barangay health worker for

nutrition. Pre- and post-tests were given before and at the end of the lecture, respectively, to measure increase in the participant's baseline knowledge on STH. Test scores were recorded using type-written names collected from the attendance sheet. Scores were totaled and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0. A paired t-test was used to determine the significant difference of test scores.

In order to emphasize experiential learning and uphold the utmost development of knowledge through skills application, the return demonstration of proper handwashing was done. The steps of proper handwashing were discussed initially with the community followed by viewing the audio-visual aid from the DOH. Six volunteer children participated in the handwashing activity. Each of them were given soap and water to demonstrate the learnt way of proper handwashing. They were guided with the DOH jingle for promoting hand sanitation. Games were prepared before and after the STHs lecture. Given that target participants of the event were both young and adult community members, a multifaceted approach in pedagogy should be considered in providing interesting topics to listeners. "Trivia Games" and "Fact or Bluff" were done in each break. Game questions were all in line to the outline of topics in the STH lay forum.

Partnership and Capacity Development

Goals of health promotion and education can be achieved by developing a strong partnership among key stakeholders and to ensure capacity building for them to take on their own roles and responsibilities in their community. This component was conceptualized due to the fact that a successful community-based health promotion requires effective community collaboration.[5] A series of meetings and dialogues were conducted with the community leaders, Homeowner's Association (HOA), Barangay officials, MHO personnel, and UST Simbahayan as they are the stakeholders in the community.

RESULTS AND DISCUSSION

Using a logical framework, program monitoring and evaluation were made by identifying objectively verifiable indicators and means of verification of each component. All components were executed according to community health plan and its objectives.

Risk Assessment

Water quality and quantity were perceived to be adequate in the community; however, they experience occasional water interruptions, especially among households situated in elevated areas.[6] Access to safe drinking water was found to be unproblematic since mineral/purified water source was readily available in their community.

For sanitation, the survey participants use level II of human household excreta; this means that households practice pour-flush latrines. The dislodging of individual septic tanks in the community depends on the initiative of each household. Disposal of solid waste materials was found to be unproblematic.

On hygiene practices and education, the community positively identified critical key times of hygienic practices. Despite participants' affirmation of proper hygiene practice, only 35% of the 81 surveyed participants practice proper handwashing with emphasis on the length of time performing handwashing. Barriers were found out that they are too busy with household chores, they just forget to wash, sometimes it is not convenient to wash due to inability to buy soap, or they have interrupted supply of water.

Inquiries about their health-seeking behavior, especially in deworming shows that within the past 6 months when the risk assessment was made, about 31 of 81 surveyed households have had history of STH among children in their family and 46 of 81 have claimed that they had STH history among members of their family other than the children. It was also determined that deworming initiatives of the DOH, DepEd and LGU, only half of the surveyed participants participate in large-scale periodic distribution of anthelminthic treatment. Consequently, about 24 of 81 (30%) claimed that they do not at all participate in the national deworming campaigns of the government. It was mentioned by the health center nurse providing community-based mass drug administration that they have observed a slight decrease in participation primarily in the community. During the interview, they emphasized the need for promotional campaigns in order to achieve full deworming coverage, especially in the community.

Table 1. Effects of Educational Lectures for Health Promotion and Concepts of Communicable Diseases on the Knowledge of Community Members using Pre- and Post-tests

	Pre-test		Post-test		*p*-value	Difference in Means
	Number of Participants	Mean Score	Number of Participants	Mean Score		(95% CI)
1. Concepts of Communicable Disease Lecture	43	7.07	43	8.79	p<0.001	1.72 (1.34 to 2.10)
2. Health Promotion Lecture	38	5.71	38	8.58	p<0.001	2.87 (2.49 to 3.25)

A total of 13 stool samples were collected from different blocks in the community. It was found out that 9 out of 14 stool samples were tested positive, 4 of the positive samples were found to have mixed infections of Ascariasis and Trichuriasis, while 5 samples were tested positive for *Ascaris* eggs. The results of fecal examination were communicated to the Rural Health Unit of Rodriguez, Rizal for treatment and recording of cases. All individuals who participated in the fecal examination were invited to the Public Health Lay Forum where a representative of Rural Health Unit discussed the availability of services against parasitic infections.

Consultative Workshop

The program lead discussed lectures on Health Promotion and Concepts of Communicable Diseases among 44 point persons in the community. Pre- and post-tests were performed before and after lectures to measure increase in their baseline knowledge for health promotion and concepts of communicable diseases. It was determined that after the tests among the community leaders, their mean test score had significantly improved ($p<0.001$). Shown in table 1, at an average, their test score in the lecture on concepts of communicable disease had increased by 1.72 points (17.2% increase in baseline knowledge) [95% CI: 1.34 to 2.10]. Meanwhile, their test score for health promotion lecture score increased by 2.87 points (28.7% increase in baseline knowledge) [95% CI: 2.49 to 3.25].

Community leaders had drafted "But Why" chart with identified issues and barriers contributing to community cases of STHs as well as their recommended solutions. Among the problems identified were lack of proper knowledge on WASH and STHs, their inability to seek medical attention, unwillingness of parents to participate in health drives in their community including deworming activities of their LGU. With guidance of the program lead and nutrition aide of the MHO, the community leaders had identified solutions that are feasible and attainable at their level.

IEC Development and Distribution

IEC materials contain the health program title and logo "OPLAN BULATE KNOW: Hawak Kamay, Hugas Kamay, Kapaligian Gawing Dalisay Upang ang Bulate ay Bye Bye" as well as highlights prevention and control of STH infections through the provision of adequate knowledge through public health education towards a positive behavioral change.

The contents of the poster and flyer were based on information and suggestion gathered from literatures, risk assessment survey, interviews and meetings. It was written in Tagalog for everyone in the community to understand the content. The logo was placed on top to highlight the project. The contents of the poster and flyer contain quick facts about STH, epidemiological triangle or mode of transmission of the three common STH of humans, signs and symptoms of infection, preventive measures mentioned in the IHCP through the WASHED framework – water, sanitation, hygiene, education and deworming, and the five easy steps of proper handwashing.

Other IECs such as notepads, calendars, shirts, mugs and foldable fans were distributed during the lay forum to strengthen information about community health programs focusing on both communicable and non-communicable diseases.

Public Health Education Lay Forum

The initial target was 50 participants, but 70 had signed up to the lay forum comprising children

Table 2. Effect of Educational Lectures for Soil-transmitted Helminthiases on the Knowledge of Community Members using Pre- and Post-tests

	Pre-test		Post-test		*p*-value	Difference in Means
	Number of Participants	Mean Score	Number of Participants	Mean Score		(95% CI)
Soil-transmitted Helminthiases 3-Part Lecture	47	5.74	47	8.64	$p<0.001$	2.89 (2.46 to 3.33)

accompanied by their parents or guardians. The lay forum was subdivided into three components: 1) STH epidemiology, nature of the parasite and its risk factors; 2) signs and symptoms among individuals infected with STH, and information on preventive and control measures for STH; and 3) on available health services for prevention and control of STH. Lectures were discussed by a medical technologist and by the barangay health worker for nutrition.

Pre-tests and post-tests were given before and at the end of the lecture, respectively, to measure the increase in participant's baseline knowledge on STH. Shown in table 2, the mean test score of participants had significantly improved ($p<0.001$) from 5.74/10 (57.4%) to 8.64/10 (86.4%). At an average, their test score increased by 2.89 points (28.9% increase in baseline knowledge) [95% CI: 2.46 to 3.33]. The participants had actively participated in the return demonstration of handwashing, lecture activities and games. It was evident that after the lecture on STHs, the participants gained knowledge on the preventive and control measures, and health services.

Partnership and Capacity Development

Through an initial meeting with key stakeholders in the community, partner organizations and the municipality of Rodriguez, Rizal, a framework of health promotion was created. As part of the community Joint Action Plan, the functional organization was identified and their specific roles and responsibilities to ensure sustainability of the health programs provided in their community. The program leads and stakeholders came across several permutations in order to lay down the roles and responsibilities of each component. A careful analysis was done to come up with a strategic direction and to ensure equal distribution of tasks based on their capacities and workload. The task force swore their roles and responsibilities in the partnership to members of their community, program leads, to the barangay captain and its barangay committee chair for health. The task force participated in a consultative workshop and assisted in logistics of the lay forum.

SUMMARY AND CONCLUSION

The public health program through the project: "Oplan BulateKNOW: Hawak kamay, hugas kamay, kapaligiran gawing dalisay upang ang bulate ay bye bye" showed how health promotion and education helped in providing the community proper information and skills in preventing STHs. The results of the consultative workshop, public health education lay forum and distribution of IECs showed how their baseline knowledge on STHs have improved. The program was also promising when the community positively responded in establishing a strengthened implementation of the community-based anti-helminth program through health education and promotion emphasizing on clean water, sanitation, hygiene and deworming practices in the community within the 6-week project timeline. Risk factors to STHs were assessed through surveys and interviews within the community. Awareness of the community regarding prevention and control of STHs were increased through the use of IECs. The

mobilization within the community was achieved through formed partnerships among stakeholders and health units. Lastly, baseline knowledge of the community on prevention and control of STHs were achieved through the public health education lay forum. With help of the WHO guiding principles on health education and promotion such as empowerment, community participation, collaboration, sustainability and adapting to local conditions and context, all objectives of the health program were achieved.

Public Health Application

Interventions in public health will be efficient when social and environmental concepts are comprehensively understood. From risk assessments, surveys, constant communication with key stakeholders, first-hand observation and community immersion, one will deeply understand the needs of a community. These approaches were based on the core principle of health promotion and education by utilizing interventions at different levels which may influence perspectives on health at the individual, organizational, community and societal levels. When applied at the community level, this may aid in addressing inequalities by enabling people to have adequate knowledge of maintaining their health and ways to prevent and control diseases. By educating the community about the impact of STH to the well-being of an individual, they gained consciousness to prevent and properly respond to it. They also gained information on how to improve their health behaviors through the public health lay forum, focused group discussions and educational materials. Future public health programs may apply these concepts by highlighting community participation, multiple approaches to reach the community, capacity building and ensuring engagement with several stakeholders such as the LGU, health units, private organizations and community leaders. Moreover, systematic program planning should be followed from community assessments and implementation to program monitoring and evaluation.

RECOMMENDATION

For future public health application, it is recommended to do quantitative statistical sampling, especially on conducting the survey and stool analysis to obtain significant yield of results. An adequate logistics and time allotment for risk assessment survey will cover a large scale of participants as well as the number of IECs produced and distributed in the community. People participation is the key to success in any public health endeavor and sustainability of the project. Strengthened community participation is therefore recommended to ensure success and sustainability of the community project. For more effective community mobilization, it requires combination or integration with an interpersonal communication strategy to sustain and encourage positive behavior. Trainings, therefore, should be done among community leaders for an adequate foundation of interpersonal communication strategy. Lastly, future public health implementors may conduct extensive monitoring and evaluation by assessing each stage of the capstone from planning, situational analysis, community intervention, implementation, training of implementors, to post-program evaluation.

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