Development of a Community-Based Communication Program for Prevention and Control of Zoonotic Diseases

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Abstract

The objective of this developmental research was to develop a program for prevention and control of zoonotic disease based on the communication for development. A 5-day program was developed. The development process was divided into two phases: phase 1, a 3-day information period, and phase 2, a 2-day intervention period. There was a total of 18 participants in phase 1 including 16 faculty members from Chiang Mai University, one public health worker, and one nurse from Nong Khwai Municipal district, Hang Dong District, Chiang Mai Province, and there was a total of 30 community representatives from Nong Khwai Municipal district in phase 2. The content of the prevention and control of zoonotic disease was validated by a 5 expert panel and the scale content validity index of scale was 1. The efficiency of the publicity medias was tested through field test. Data was analyzed using description statistics. The community-based communication program for prevention and control of zoonotic disease transmission was developed. Publicity medias included posters, Lanna native songs, slogans, radio message spots, and folk songs were also developed during the study. This study indicates that the program and publicity medias are appropriated for using to prevent and control of zoonotic disease transmission in communities of Upper Northern Part of Thailand.

Keywords: Community-Based Communication Program, Prevention and Control of Zoonotic Disease Transmission.

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การพัฒนาโปรแกรมการสื่อสารโดยมีชุมชนเป็นฐานสำหรับการป้องกันและควบคุมโรคติดต่อจากสัตว์สู่คน

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บทคัดย่อ

การวิจัยเชิงพัฒนานี้มีวัตถุประสงค์เพื่อพัฒนาโปรแกรมสำหรับการป้องกันและควบคุมโรคติดต่อจากสัตว์สู่คนตามแนวคิดการสื่อสารเพื่อการพัฒนา โปรแกรมได้พัฒนานี้มีระยะเวลา 5 วัน กระบวนการพัฒนาถูกแบ่งออกเป็น 2 ขั้นตอน คือ ขั้นตอนที่ 1 เป็นระยะเวลา 3 วันสำหรับการให้ข้อมูล และขั้นตอนที่ 2 เป็นระยะเวลา 2 วันสำหรับการลงมือปฏิบัติ ในขั้นตอนที่ 1 มีผู้ให้ข้อมูลทั้งหมดจำนวน 18 ราย ซึ่งประกอบด้วยอาจารย์จากมหาวิทยาลัยเชียงใหม่จำนวน 16 ราย นักสาธารณสุข 1 ราย และพยาบาลจากเทศบาลตำบลหนองควาย 1 ราย และในขั้นตอนที่ 2 มีผู้แทนชุมชนจากเทศบาลตำบลหนองควายทั้งหมดจำนวน 30 ราย การทดสอบคุณภาพด้านความตรงของเนื้อหาเกี่ยวกับการป้องกันและควบคุมโรคติดต่อจากสัตว์สู่คนโดยผู้ทรงคุณวุฒิจำนวน 5 ท่านได้ค่าดัชนีความตรงของเนื้อหาเท่ากับ 1 การประเมินประสิทธิภาพของสื่อที่พัฒนาขึ้นแบบกลุ่มภาคสนาม วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา

โปรแกรมการสื่อสารโดยมีชุมชนเป็นฐานสำหรับการป้องกันและควบคุมโรคติดต่อจากสัตว์สู่คนได้รับการพัฒนาขึ้น สื่อที่ใช้ในประชาสัมพันธ์ที่ได้รับการพัฒนาระหว่างการวิจัยด้วยมี โปสเตอร์ เพลงพื้นเมืองล้านนา สโลแกน ข้อความโฆษณาทางวิทยุสั้นๆ และเพลงพื้นบ้าน การวิจัยชี้ให้เห็นว่าโปรแกรมและสื่อที่ใช้ในประชาสัมพันธ์นี้มีความเหมาะสมที่จะใช้ในการป้องกันและควบคุมการแพร่กระจายของโรคติดต่อจากสัตว์สู่คนได้ในชุมชนภาคเหนือตอนบนของประเทศไทย

คำสำคัญ: โปรแกรมการสื่อสารโดยมีชุมชนเป็นฐาน, การป้องกันและควบคุมโรคติดต่อจากสัตว์สู่คน

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Introduction

Zoonotic diseases are diseases of animals that can be transferred to people. Many emerging diseases are classified as zoonotic diseases. Transmission of zoonotic diseases may be either direct or indirect via food, water, and environmental vectors. Approximately 75% of recently emerging infectious diseases affecting humans are diseases of animal origin. (The American Veterinary Medical Association, 2008). Examples of zoonotic diseases which have a direct transmission mechanism include rabies and anthrax; those with indirect vectors are transmitted via food, water, and the environment and include *Streptococcus suis* infection and liver fluke-associated cholangiocarcinoma (CCA). *Streptococcus suis* infection in humans and liver fluke-associated CCA are common diseases in the northern part of Thailand, including Chiang Mai Province**.** In Thailand, the case fatality rate from *S. suis* infection was 6.46 % during the period 2011-2013 (Wongkumma et al., 2014); however, a study of *S. suis* infection in humans conducted in 2010 in Phayao province in northern Thailand found a case fatality rate of 16.1% and an estimated incidence rate of 6.2 per 100,000 in the general population (Takeuchi et al., 2012). The majority (75%) of cases with *S. suis* infection were men and the highest number of cases were found in adult workers (Navacharoen et al., 2009; Wongkumma et al., 2014). The patients in pig-related occupations and those with a history of eating high-risk foods were found to have *S.suis* infection rates of 38.1% and 37.3%, respectively (Huong et al., 2014). In Thailand, important risk factors of *S.suis* infection were uncooked pork or raw pig blood consumption and exposure to contaminated pigs or pork. A well-known and popular recipe was "*larb*" or "*lu*", which consists of undercooked pork, pig blood or undercooked internal organs of pigs. (Wongkumma et al., 2014; Takeuchi et al., 2012). Also Navacharoen et al. (2009) reported that a past history of consumption of raw pork and/or pig's blood was found in 62.5 per cent of patients admitted at a tertiary care hospital in northern Thailand, whereas contact with swine products was found in 25% of those patients. For prevention and control of the disease, food safety control should be strengthened, especially for raw pork products in northern Thailand (Takeuchi et al., 2012).

Liver fluke-associated cholangiocarcinoma (CCA) disease is also common in the northern part of Thailand (Sripa & Pairojkul, 2008). Liver fluke infection, caused by *Opisthorchisviverrini (OV),* induces chronic inflammation leading to oxidative DNA damage of the infected biliary epithelium and malignant transformation (Sripa et al., 2011). The

prevalence in Thailand averaged 9.6% or a total of 6 million people in 2010 (Shin et al., 2010) and 8 million people in 2011(Sripa et al., 2011). The primary prevention of CCA in high-risk populations is based on efforts to reduce OV infection through emphasis on reduced consumption of alcohol and preserved meats, and increased consumption of dietary folate (Songserm et al., 2010).

The important risk factors of *S. suis* and liver fluke infection in Thai northern people are consumption of uncooked pork or raw pig blood and raw freshwater fish. These behavioral risk factors have to be changed, and appropriate behaviors sustainably introduced. Most can be avoided by understanding the risks, and following individual health prevention behaviors such as hand washing and appropriate hygiene, using personal protection, ensuring food safety, children and animal care, and pet healthcare (Agromisia, 2008).

The United Nations Children's Fund (UNICEF) Communication for Development (C4D) approach is one of the most effective ways of empowering improvement of health, nutrition and other key social outcomes. C4D is defined by UNICEF as a systematic, planned and evidence-based process to promote positive and measurable individual behaviors and social change (The United Nations Children's Fund [UNICEF], 2015). Sustainable and long–term behavioral and social change, based on the C4D approach, is achieved through a participatory, and human rights-based process of social transformation (Clark et al., 2015). This study was designed to develop a communication program, based on C4D to enhance the capacity for prevention and control of zoonotic disease transmission in communities in Northern Thailand. The results of this study provide a guideline or program and educational aids for enhancing the abilities of participants in C4D applications to prevent and control zoonotic disease.

Objectives

The objective of this study was to develop a program for the prevention and control of zoonotic disease transmission, based on the C4D concept.

The framework of the study

A prevention and control of zoonotic disease (PCZD) program is developed, based on The United Nations Children's Fund (UNICEF) Communication for Development (UNICEF, 2015). The population are divided into 3 groups: primary, secondary, and tertiary. The people who actually perform the behavior are called the primary group. The people who influence the primary group are called the secondary group, and the people who influence the secondary group are called the tertiary group. There are six stages in C4D strategies, that is, stage 1 -provision of information; stage 2 – communication for behavioral change analysis; stage 3 – communication for behavioral change planning; stage 4 –communication instrument development; stage 5 – implementation; and stage 6 –evaluation. This PCZD program development involved stages 1 to 4, as follows:

1) Provision of information on the prevention and control of zoonotic disease transmission.

2) Communication for behavioral change analysis involved establishing priorities related to the communication issues; determining participant groups; in each participant group, assessing feasible behaviors, benefits, barriers, beliefs, group norms, and feelings related to the recommended behaviors for the prevention and control of zoonotic disease transmission among Chiang Mai Northern Thai people.

3) Communication for behavioral change planning involved conducting communication analysis and setting the specific, measurable, attainable and relevant, realistic, and time-bound (SMART) communication objectives in each participant group and establishing the monitoring and evaluation items for a PCZD by the three participant groups.

4) The communication instrument development activity included drafting, presenting, setting, and choosing communication messages by all target participants; providing creative messages to designers, composers, folk song and instrumental musicians, and advertisers, discussing the designs and messages for communication effectiveness and producing draft versions, revising those versions based on discussion, and producing the final version for production.

Research methodology

This study used a developmental research approach to develop a program related to prevention and control of zoonotic disease.

Population and sample

A total of 48 individuals, divided into two groups of 18 and 30 participants, contributed to the program development. Participants in phase1 included 18 participants of whom 16 participants were faculty members of Chiang Mai University (10, 5, and 1 from the Faculty of Nursing, Faculty of Veterinary Medicine, and Faculty of Medicine, respectively) and 2 participants were public health personnel from Nong Khwai Municipal district, Hang Dong District, Chiang Mai Province. Participants in phase 2 included 30 community representatives of Nong Khwai Municipal district. The primary group participants, who consumed uncooked pork or raw pig blood and raw fresh water fish, included 6 persons living in the community. The 18 participants in the secondary group consisted of 14 village health volunteers (core working persons), 2 butchers (slaughterers and wholesale meat vendors at the local village market), 1 teacher (who taught health subjects in the local primary school), and 1 Buddhist monk. The tertiary participants were 6 community leaders, consisting of 1 mayor, 3 councilors, 1 village headman, and 1 village health volunteer leader.

Activities for prevention and control of zoonotic disease program development

The activities for program development according to the four stages of the C4D strategies were set in 12 steps. The activities of a program were divided into two phases, phase 1 and phase 2. Phase 1 was an information period and composed of step 1 to 6. Phase 2 was an intervention period and composed of step 7 to 12.

The activities were set as follows:

Step 1: Explain methods of prevention and control of zoonotic disease transmission, and the C4D concept and process to the 18 health personnel.

Step 2: Assess the priorities related to communication issues related to the prevention and control of zoonotic disease transmission for Northern Thai people in Chiang Mai.

Step 3: Identify participant groups for the delivery.

Step 4: Draft communication messages on the subject.

Step 5: Discuss feasible behaviors, benefits, barriers, beliefs, group norms, and feelings regarding the recommended behaviors with each participant group.

Step 6: Assess communication and set SMART communication objectives in primary, secondary, and tertiary groups.

Step 7: Present the drafted messages by the participants of phase 1 to the participants of phase 2, composing of the primary, secondary and tertiary groups and let them set the priorities of the messages and choose the communication channels to convey the messages.

Step 8: Provide creative messages to designers and composers, folk song and string instrumental musicians, and advertisers.

Step 9: Discuss the designs and messages with all participants for communication effectiveness and produce the final versions for production.

Step 10: Revise the designs and messages based on feedback from step 9.

Step 11: Prepare the final version for production.

Step 12: Set monitoring and evaluation items for the guideline for the three groups participating.

The teaching instruction methods used included lectures, discussions, demonstrations, observation, presentations, community mapping, transect walks, body mapping, PowerPoint presentations, card sorting, flip charts, and field notes. The phase 2 participants provided critical feedback about the medias, which had been developed by the participants in phase 1. They also evaluated and selected appropriate communication channels.

Instruments

Instruments were divided into two parts: instruments for research implementation and an instrument for data collection. Instruments for research implementation included a booklet on the prevention and control on zoonotic disease transmission and a booklet on C4D. The instrument for data collection consisted of a demographic data questionnaire.

Validity of instruments

Content validity of the booklet on the prevention and control on zoonotic transmission was reviewed and validated by a panel of five experts. The content validity of the C4D booklet had been validated by UNICEF.

Data analysis

The demographic data were analyzed by using descriptive statistics.

Ethical considerations

The study was approved by the Research Ethics Review Committee of the Faculty of Nursing, Chiang Mai University (EXP: 123-2013) and health agencies involved. The

research conforms to the provisions of the Declaration of Helsinki in 1995 (as revised in Edinburgh 2000). All participations were fully informed about the objectives of the study, study procedures, reports of findings, and benefits of joining the study. They were able to withdraw from the study at any time. Confidentiality and anonymity of subjects was assured through the use of a consent form. Information obtained from subjects was used only for this study.

Results

A community-based communication program for prevention and control of zoonotic diseases or the "Don't Eat Raw Meat and Fish Guideline" was established for health personal such as physicians, nurses, public health personnel, and community health volunteers.

The "Don't Eat Raw Meat and Fish Guideline" was composed of seven activities, shown as follow:

1) The peoples, living in the community, were divided into 3 groups. The first, second, and tertiary groups. The first group was composing of peoples, who consume uncooked pork or raw pig blood and raw freshwater fish. The second group was composing of family members, neighborhood, village health volunteers, butchers, teachers, and monks. The third group was composing of mayor, village headman, and village health volunteer leaders.

2) Nurses, public health personnel, and village health personnel understood the SMART objectives: the number of cases of S. suis infection and/or CCA cases, and the number of cases consume raw meat and fish.

3) The peoples in the second and tertiary groups were provided information on prevalence and incidence, cause, signs and symptoms, and the prevention of hearing loss and CCA caused from eating raw meat and fish by nurses and/or public health personnel. The educational materials were C4D handbook, native song, string song, brochure, leaflet, and poster.

4) The tertiary group peoples supported the behavior change of the first group peoples by setting the activities in the plan or setting the policy and support the budget.

5) The peoples in the first group, who ate raw meat or raw fish or both, were provided information on prevalence and incidence, cause, signs and symptoms, and the prevention of hearing loss and CCA caused from eating raw meat and fish by the village

health personnel (the second group). The educational materials were native song, string song, brochure, leaflet, and poster. The other peoples in this group motivated, encouraged, and mental supported the first group peoples to change behavior.

6) Nurses, public health personnel, and village health personnel monitored and evaluated the activities.

7) The first group peoples maintain the new behavior and were supported by the second and tertiary group peoples.

The medias were developed, composed of healthy and disease–free human poster, leaflets on the prevention and control of hearing loss, and CCA, slogans, 2 songs: Lanna native songs (*saw*) which was folk music and popular song, and don't eat raw meat and fish message spots. Also the healthy and disease–free human poster was developed as a problem tree. Essential prevention activities for a healthy and disease-free human, shown on the poster, were

1) Use a standard slaughterhouse;

2) Buy certificated pork, chicken, beef, buffalo;

3) Separate chopping block, knife, spoon between using with meat, and vegetables and fruits;

4) Defecate in a toilet. Do not defecate in the river or canal or scatter feces;

5) Freeze raw meat not more than 1 month to killing eggs of parasite;

6) Alcohol/spirit/liquor cannot kill microorganisms;

7) Burn/bury dead animals and wash hands every time when you do it;

8) Wash hands before and after contact with sick animals/dump/blood, and when you cough or sneeze; and

9) Eat well done cooked pork, fish, shrimp, fermented fish, fermented pork, minced pork.

Slogans were composed of:

1) Far away from liver cancer, do not eat raw shrimp, raw fermented fish;

2) Raw pork, raw fish, lead to hearing loss, and liver failure;

3) Eat raw meat, delicious but get diseases;

4) Eat cooked food, no sorrow no diseases;

5) Modern temple fair, do not have raw minced pork;

6) Stop eating raw fish, long life many 10 years;

7) Love neighbor, don't persuade eat raw minced pork;

8) Take care of your liver. Stop/restrain from eating raw fish;

9) Clean hand, No disease;

10) Kill parasite/microorganisms by cooking food; and

11) Modern temple fair. Eat cooked minced pork.

Discussion

Human is living together as family or community. A community is a social unit of any size that shares common values, or that is situated in a given geographical area e.g. a village or town. Human communities may share intent, belief, resources, preferences, needs, and risks in common, affecting the identity of the participants and their degree of cohesiveness . We are all part of a family, a neighborhood, a community, and a society. Each of these units has a direct or indirect influence on us. Up to these influencing relationships, the peoples in a community are divided into 3 groups: primary, secondary, and tertiary groups (Scandlen, 2009). The primary group is a group of persons who behave. The secondary group is a group of persons who influence the primary group. The tertiary group is a group of persons who influence the secondary group. For behavior change of individuals, communication uses multiple channels as appropriate with individuals of groups to inform, motivate, problem solve or plan, in order to promote and sustain behavior change. It focuses on knowledge, attitudes, and practices directly linked to a program's goals (Scandlen, 2009).

Because of the significant impacts of *S. suis* and liver fluke infection on health, the PCZD progrm or the **"**Don't Eat Raw Meat and Fish Guideline**"** was developed by a group of people living in Nong Khwai Municipal district, Hang Dong District, Chiang Mai Province. This group of people included individuals who consumed uncooked pork or raw pig blood and raw freshwater fish, village health volunteers, butchers, teachers, a monk, a mayor, councilors, a village headman, and village health volunteer leaders. Communication channels and media as Lanna native songs (*saw*) which is folk music, popular song (Don't Eat Raw) and message spots, slogans, healthy and disease –free human poster, and leaflets were developed and evaluated by that group. The Lanna native songs were developed by a folk artist, and the message spots and popular song were developed by the Chiang Mai junior musicians. The PCZD **(**Don't Eat Raw Meat and Fish**)** program and the publicity medias should be accepted by the Northern Thai people, particularly the people in the Chiang Mai province.

Saw is one of words of songs in Northern part of Thailand, which sing for enjoyableness, entertainment, providing knowledge, and thought including philosophy, moral, and telling regarding custom. It is always used with music, that musical instruments are composed of bamboo flute, and stringed instrument such as seung, and salaw (Thongkum, Inthanivet, & Panapongpaisarn, 2014). This song is originating among the people of the Northern part of Thailand, called Lanna. This music has been transmitted and evolved by a process of oral transmission or performed by custom over a long period of time through families and other small social groups (Thongkum, Inthanivet, & Panapongpaisarn, 2014). Because people can remember 10 % of what they read (ACRLog, 2014), slogan, merely possesses a supportive role, is helpful to understand. A slogan is a word or phrase that is easy to remember and is used by a group or business to attract attention (Sanburanuruk, 2007). A slogan usually has the attributes of being memorable, very concise and appealing to the audience. (Lim & Kwok, 2015). A slogan can be a few simple words used to form a phrase that can be used in a repetitive manner, and it can have a musical tone to it or be written as a song. Slogans are used to convey a message for raising the audience's awareness (David, 2011) and attention, and influencing the audience's thoughts and behaviors (Ke & Wang, 2013). Slogans can also provide information to the audiences about the benefits or advantages on good consumption practice (David, 2011).

Therefore, the success outcomes of public education for behavior change should be used multiple channel communication that appropriate for the people in community. The people also participate all process and make decision to develop these educational aids/materials.

Recommendations

1. Nurses, nutritionist, and public health personnel use this program for nutrition promotion, which as it uses appropriate communication channels and materials to change behavior, e.g., A-V aids, booklets, and media.
2. Nurse educators can apply this communication for behavior change guideline and materials to improve teaching and learning for nursing students.
3. The results could provide valuable information to public health nurses, community leaders, and community policy makers in that communication guideline and materials

are should put in the community planning for control and prevention of zoonotic disease transmission.

4. The effectiveness of this “Don’t Eat Raw Meat and Fish Program” on fish and meat consumption should be evaluated in other groups of people living in Northern Thai villages.

Conclusion

The results of this study provided guidelines and educational materials for public health activities, training, and workshop, where participants may further enhance the application of C4D for the control and prevention of zoonotic diseases.

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