

Effects of Swine Flu A (H1N1) 2009 Prevention Program in Primary School Students

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A quasi-experimental research aimed to compare knowledge, attitude, and practice perception to prevent transmission of and infection by pandemic influenza type A (H1N1) among students at Ban Ladsabua School, Amphur Yangtalad, Kalasin province. Significant differences were determined by the paired t-test. The findings revealed significant differences at $p < 0.05$ in knowledge, attitude, and practice perception for preventing transmission of and infection by this influenza. After health education, knowledge at the good level increased from 42.4% to 75.8%, attitude at the excellent level increased from 6.1% to 75.8%, and practice perception for preventing influenza type A (H1N1) transmission at the most appropriate level increased from 63.6% to 72.7%. Health education about pandemic influenza can improve knowledge, attitude, and practice. It is recommended that health professionals should focus on providing health services to support learning opportunities which can increase the level of understanding of people in communities for an appropriate method of disease transmission management.

Keywords: Swine Flu A (H1N1) 2009, knowledge, attitude, practice perception

Swine Flu A (H1N1) 2009 was caused by the influenza virus which had mutated from human, pig and bird influenza viruses. The initial outbreak of this influenza virus was found in Mexico and the United State of America and the extended to a range of countries. Transmission and infection of Swine Flu A (H1N1) 2009 in Thailand was periodic exacerbation and gradually increased during the pandemic period (Panchalee, 2009). This outbreak had negative effects on the health, economic system and society of Thailand. In the past, pandemic influenza type A (H1N1) happened 3 times in 1918, 1957, and 1968 (Hobday & Carson, 2009). Between 1918 and 1919, pandemic influenza type A (H1N1) led to a huge number of deaths, it was estimated that there were between 50-100 million deaths from pandemic influenza (Crosby, 2003; Hobday & Carson, 2009). During 2009, the Swine Flu A (H1N1) 2009 pandemic was a significant public health problem and socioeconomic problem globally. World Health Organization (WHO) reported on 2nd May 2009 that 214 countries were facing pandemic Swine Flu A (H1N1) 2009 and 18,001 people had died. Consequently, WHO launched a surveillance program, in particular, in South and South-East Asia where there were 1,787 deaths from Swine Flu A(H1N1) 2009 pandemic (WHO, 2010). During the pandemic period (from April, 2008 to 12 May, 2009) the mobility rate of Swine Flu A (H1N1) was 58.25 per 100,000 people in the Thai population and there were 225 deaths from Swine Flu A (H1N1) 2009. In Mahasarakham province the morbidity rate was 36.93 per 100,000 people in the population; and in Kalasil province the rate was 18.09 per 100,000 people in the population (Disease Control Department, 2009).

Swine Flu A (H1N1) 2009 infection and transmission is preventable, therefore, providing knowledge about the disease including causes and effects of the disease, route of infection and means of preventing transmission and infection by Swine Flu A (H1N1) 2009 is essential to protect the community and its people from pandemic Swine Flu A (H1N1) 2009. Preparing communities to gain understanding about pandemic flu is essential to support the prevention programme (Marshal, Ryan, Robertson, Street & Watson, 2009). Particularly, primary school

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students who are likely to get Swine Flu A (H1N1) 2009 infection (“Talking to Children about Swine Flu”, 2009) because students spend time in classrooms with others for at least 8 hours per day and use public facilities such as canteen and restroom with other people regularly. A lack of knowledge about Swine Flu A (H1N1) 2009 and means to prevent the disease can increase the infection rate among students. Once students are infected by Swine Flu A (H1N1) 2009, it means that the students’ communities also at high risk of H1N1 infection. The first episode of pandemic of Swine Flu A (H1N1) 2009 was in 2008, its vaccine was not well developed. Therefore, cooperation of students to protect themselves from Swine Flu A (H1N1) 2009 infection and prevent transmission of the disease to other people was necessary (Stevenson, Barrios, Cordell, Delozier, Gorman, et al., 2009).

Knowledge is one of the essential components to enable disease understanding, modify attitudes and can motivate disease prevention practice. Although primary school students can access information about pandemic Swine Flu A (H1N1) 2009 via mass media, public messages are likely to make children more anxious (“Talking to Children about Swine Flu”, 2009). This anxiety leads to ineffective learning and can limit students’ understanding and form inappropriate attitudes about the disease. In addition, during the ongoing pandemic influenza in 2009, there was less focus on a preventive plan which addressed children specifically (Stevenson, et al, 2009). As the significance of knowledge and lack of specific prevention program for children, the researchers developed a plan for Swine Flu A (H1N1) 2009 which was fitted with students in the northeastern context. It was expected that this specific program for primary school students could improve the students’ ability to learn. This concurs with a study in Australia which reported that providing clarify materials about pandemic influenza increased the willingness of compliance with containment measures of pandemic influenza (Eastwood, Durrheim, Francis, d’ Espaignet, Duncan, et al., 2009). In Thailand, it is no specific health education program for Swine Flu A (H1N1) prevention for school children. Therefore, this health education program aimed to support primary school students to understand about Swine Flu A (H1N1) 2009 infection and methods to control transmission of the disease. This understanding could also help the students develop appropriate attitudes and enable students to keep using prevention of Swine Flu A (H1N1) 2009 infection and transmission practices.

Research Objectives

1. To explore knowledge, attitude and preventive practice perception of primary school students.
2. To compare knowledge, attitude and preventive practice perception regarding Swine Flu A (H1N1) 2009 infection and transmission among primary school students before and after participate in swine flu prevention program.

Methodology

Research Design

This study was a quasi-experimental research approach using one group pretest-posttest research design.

Research Setting and Sample

This study was conducted in a primary school in the Northeastern part of Thailand. Following human ethics approval, primary school students were invited to participate in this

study by purposive sampling. The participants were sixty-six students who were attending school in Ban-Lad-Sra-Bua, Tambol Yang-Ta-Lad, Kalasil Province.

Research Instruments

The research instruments in this study consisted of 1) data collecting instruments, which were demographic information sheet, questionnaires about knowledge, attitude and preventive perception of infection by and transmission of Swine Flu A (H1N1) 2009 disease; and 2) handbook which was used as an intervention instrument named "swine flu transmission and control". The detail of each instrument is described as follows:

1. Demographic information sheet developed by the researcher included age, sex, grade, students' daily income and their home location.

2. The questionnaire was developed by the researcher and the reliability of this questionnaire was 0.77. The questionnaire comprise of 3 parts as follow:

2.1 Knowledge about Swine Flu A (H1N1) 2009 questionnaire contained 20 items to determine knowledge about Swine Flu A (H1N1) 2009, transmission rout, infection symptoms, effects of the disease, treatment, and means to prevent the disease. Knowledge scoring was marked as 1 for correct and 0 for incorrect. The total score range was from 0-20. Knowledge score was divided into 3 levels as follow:

0-10 score is defined as fair knowledge

11-14 score is defined as moderate knowledge

15-20 score is defined as good knowledge

2.2 Attitude toward Swine Flu A (H1N1) 2009 questionnaire contained 12 items to determine attitude about Swine Flu A (H1N1) 2009. A three- point Likert scale was used to range the score. Item responses range from 1-3, that represented the students' positive views and negative views on the items. There were 9 positive items which were scored as 1 for disagree, 2 for agree and 3 for strongly agree with the item and 3 negative items scored as 1 for strongly agree, 2 for slightly disagree, and 3 for disagree. The total range of scores was from 12-36. The score were divided into 4 levels as follows:

12-17 score is defined as not good attitude

18-23 score is defined as moderate attitude

24-29 score is defined as good attitude

30-36 score is defined as excellent attitude

2.3 Preventive practice perception of infection by and transmission of Swine Flu A (H1N1) 2009 contained 9 items to determine participants' preventive practice perception to prevent themselves from becoming infected and also to prevent transmission of the disease to others. A three-point Likert scale was used to range the scores. Item responses ranged from 0-3 representing the students' preventive practice perception of the items, scored as 0 for no perception, 1 for occasional perception and 3 for regular perception. The total score range was from 0-18. The score was divided into 3 levels as follow:

0-6 score is defined as inappropriate for preventive practice perception

7-12 score is defined as appropriate for preventive practice perception

13-18 score is defined as very appropriate for preventive practice perception

3. The handbook of swine flu transmission and control which was developed by the researcher consisted of information about Swine Flu A (H1N1) 2009 which fitted with the social context of primary school students. For example the content was simplified which was easy for children's understanding. It included information about the cause and route of

infection and transmission, signs and symptoms of the disease, the disease treatment, and preventive practice guideline.

Research Implementation

1. Preparation phase, the research proposal was submitted to and approved by the Nursing Faculty, Maharakham University. Permission was obtained from the director of the school. The researchers also met with primary school students to explain the nature of the study and study procedures.

2. Implementation phase, students participate in education aimed to facilitate gaining of knowledge, develop appropriate an attitude, and recognize essential skills to prevent Swine Flu A (H1N1) 2009 infection and transmission. Role plays, story-telling, and pictures were used to encourage children participation and concentration in the educational sessions.

3. Data collection by questionnaires to attain scores of knowledge, attitude and preventive practice perception scores.

Data Analysis

Frequency and percentage were calculated to describe the general characteristics of primary school students. Mean and standard deviations were calculated to determine the knowledge, attitude, and preventive practice perception of the students.

Paired t-test was used to compare statistical differences at $p= 0.05$ of mean scores of knowledge and attitude toward Swine Flu A (H1N1) 2009, and preventive practice perception before and after participate in educational sessions.

Results

This study was quasi-experimental research on one group pretest-posttest that examined the effects of participate in a health educational program on students' knowledge, attitude and preventive perception of Swine Flu A (H1N1) 2009. The findings from this study reveal interesting points which will be presented as follows:

1. Characteristics of the primary school students.
2. Comparisons of average scores on knowledge, attitude and preventive practice perception of Swine Flu A (H1N1) 2009.

Characteristics of Primary School Students

Fifty-five percent of participants were age between 11-12 years old. A majority of students were male (53.0%) and studying in grades 1-4 (53.0%). Most of the participants had a daily income of 40-59 baht per day (36.4%) and lived in Ban-Lad-Sra- Bua (68.2%).

Comparisons of Average Scores on Knowledge, Attitude and Preventive Perception of Swine Flu A (H1N1) 2009

The knowledge level of primary school students after participated in the swine flu health education program was higher. Before participation in the program, most of the students' knowledge was scored at the moderate level (57.6%). After participation, most of the students' knowledge was scored at the good level (75.8%) as shown in table 1.

Table 1

Comparison of Knowledge Levels before and after Attending Health Education Program

Knowledge Levels		Before		After	
		Frequency	Percentage	Frequency	Percentage
Fair	(0-10 scores)	0	0	0	0
Moderate	(11-14 scores)	38	57.6	16	24.2
Good	(15- 20 scores)	28	42.4	50	75.8

Table 2

Comparison of Attitude Levels before and after Attending Health Education Program

Attitude Levels		Before		After	
		Frequency	Percentage	Frequency	Percentage
Not good	(12-17 scores)	-	-	-	-
Moderate	(18-23 scores)	9	13.6	2	3.0
Good	(24-29 scores)	53	80.3	14	21.2
Excellent	(30-36 scores)	4	6.1	50	75.8

Attitude levels of primary school students after participation in the swine flu health education program increased. Before participation in the program, most of the students' attitude scores were at the good level (80.3%). After participation, most of the students' attitude scores were at the excellent level (75.8%) as shown in table 2.

Table 3

Comparison of Preventive Practice Perception Levels of Swine Flu A (H1N1) 2009 before and after Attending Health Education Program

Preventive Practice Perception Level		Before		After	
		Frequency	Percentage	Frequency	Percentage
Inappropriate	(0-6 scores)	2	3.0	1	1.5
Appropriate	(7-12 scores)	22	33.4	17	25.8
Very Appropriate	(13-18 scores)	42	63.6	48	72.7

Table 4

Difference of Knowledge, Attitude, and Preventive Practice Perception of Swine Flu A (H1N1) 2009 Mean before and after Health Education

Items	Before		After		t-test	p-value
	mean	S.D.	mean	S.D.		
Knowledge	14.29	1.11	15.52	1.65	-5.662	.000*
Attitude	26.47	2.64	31.20	3.11	-13.189	.000*
Preventive Practice Perception	12.79	2.59	14.35	5.45	-2.402	.019*

*Statistically significant difference p<0.05

Preventive practice perception level of primary school students after participation in the swine flu health education program increased. Before participation in the program, most of the students' preventive practice perception scores were at the very appropriate level (63.6%)

and after the participation, even more of the students' preventive practice perception scores were at the very appropriate level (72.7%) as shown in table 3.

The t-test showed statistically significant differences ($p < 0.05$) between the average scores of knowledge, attitude, and preventive practice perception from primary school students before and after participating in the health education program. The results showed that after participating in the health education program, the mean scores of knowledge, attitude, and preventive perception increased from 14.29 to 15.52, 26.47 to 31.20, and 12.79 to 14.35 respectively as shown in table 4.

Discussions

The findings indicated that students who participated in the health education program understood and were aware of Swine Flu A (H1N1) 2009, gained appropriate attitudes and perceived the means of infection prevention and how to control disease transmission.

Health professional awareness of providing useable information, which is specific to each population context, is essential to increase the compliance with containment measures during an outbreak of Swine Flu A (H1N1) 2009. During the outbreak of Swine flu A (H1N1) 2009, the information about the disease and ways of disease control was made available through the mass media. However, this availability cannot guarantee people's understanding about disease and prevention. According to Eastwood and others (2009) it was found that only 23 percent of people who participated in the survey knew about the swine flu 2009 pandemic. Marshall and others (2009) also reported that 50.2 percent of household were never informed about swine flu 2009 and they were not concern about the effects of this disease. Health professionals are one group of significant people that can educate people during infectious disease outbreaks. Encouraged people who provide health care should learn about disease and disease prevention to facilitate control of Swine Flu A (H1N1) 2009 outbreak. As a result of people's knowledge about swine flu, the findings from this study point out that a Swine Flu A (H1N1) 2009 prevention program lead by nurses could improve participants' swine flu knowledge. A number of studies report that health education led by nurses is one of the appropriate ways to encourage people to understand about health, disease and disease prevention.

Understanding ways to prevent Swine Flu A (H1N1) 2009 can also improve attitudes and reduce anxiety which would enable people to perform practical prevention practices ("Institutions Take Precautions Against Swine Flu", 2009). This concurs with the findings of this study which found that the participants' attitudes were more appropriate as a result of better knowledge about disease, and methods of transmission. These help people to develop self-care management. Therefore, it should be kept in mind that providing knowledge as a part of a support program for people to improve their attitude can encourage appropriate and effective disease prevention practice. According to Larson, Ferng, Wong-McLoughlin, Wang, Haber and Others (2010), they concluded that knowledge and attitude influenced appropriate prevention practice of respiratory infection disease and flu. These findings concur with the result of the study that participating in education programs can improve participants' knowledge and prevention appropriate perception about swine flu.

Community- based health education is an essential factor of communicable disease prevention (Gould & Drey, 2009; Mitty, 2009; Public Health Agency of Canada, 2009). In particular, pandemic disease, as the United States Department of Health and Services stated

that informing people in a community is necessary for reducing effects of pandemic communicable disease and its effects on society (American College Health Association, 2009). Thailand also addresses providing knowledge to enable people to understanding information as one of the essential strategies for Swine Flu A (H1N1) 2009 (Ministry of Public Health [MOPH]a, 2009; MOPHb, 2009) because during the outbreak, people need clarity and practical knowledge about transmission and practical prevention practice to protect themselves, families and communities. These should also encourage community participation and cooperation which may reduce morbidity and mortality rate.

Conclusions

Primary school students got significant benefits from participating in the Swine Flu A (H1N1) 2009 health education program. The aim of the program was to inform the students about the disease and means to prevent infection and transmission during the outbreak of Swine Flu A (H1N1) 2009. During the outbreak children are the most vulnerable and can be the vehicle of disease transmission to their families. Providing knowledge for children is an effective strategy to educate family, in particular, children's parents. The messages about the disease and its precaution method can be extended to wider community. It is recommended that, during the emergence of communicable disease, health professionals are one significant group of people who should provide clarity and useable information. The program is needed to address the needs of each population and should concern the social and cultural diversity which impacts on learning possibility. This health education program can prevent people from becoming infected as they have clearly understanding about and effects of diseases directly from health care providers.

Recommendations

Policy

During an emergency outbreak of a communicable disease, providing knowledge, transmission prevention and prevention practice by health professionals is needed to be addressed as essential policy which is as important as mass media campaigns. The significance of innovative programs which fit with each social context is needed to be addressed as this strategy can facilitate people to comply with containment measures.

Nursing

Nurses whose work is community-based and/or hospital-based should be aware of the significance of and regularly inform people about the emergence of communicable diseases, transmission situation and prevention guidelines. Nurses also should provide health education programs in education institutions and facilitate community health workers to provide knowledge regularly.

Nursing education

Nursing curriculums need to contain information about emergence of Swine Flu A (H1N1) 2009 management and encourage nursing students to participate in pandemic prevention management. This education preparedness should enable nursing students' awareness of emergence disease control.

Possibly of Future Research

Future research should be addressed on:

- Implementing a swine flu education program in high schools and universities in order to determine the effects of this program toward knowledge, attitudes and preventive practice perception,
- Study how communities participated in Swine Flu A (H1N1) 2009 pandemic prevention,
- Explore support and barrier factors of Swine Flu A (H1N1) 2009 prevention,
- Develop community-based programs to promote Swine Flu (H1N1) 2009 prevention.

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References

- American College Health Association. Campus response to novel influenza H1N1. *Journal of American College Health*, 58 November/December, 281-289.
- Crosby, A.W. (2003). *America's forgotten pandemic: The influenza of 1918*. (2nd ed.). Cambridge, England: Cambridge University Press.
- Disease Control Department, Ministry of Public Health. (2009). *Swine Flu A (H1N1) 2009 surveillance at May 5, 2009*. Retrieved June 20, 2011 from <http://epid.moph.go.th>
- Eastwood, K., Durrheim, D., Francis, J.L., d' Espaignet, E.T., Duncan, S.I., Slam, F., et al. (2009). Knowledge about pandemic influenza and compliance with containment measures among Australians. *Bulletin World Health Organization*, 87, 588-594.
- Gould, D. & Drey, N. (2009). Preventing the spread of acute respiratory viral infections. *Nursing Standard*, 24 (5), 44-49.
- Hobday, R.A., & Cason J.W. (2009). The open-air treatment of pandemic influenza. *American Journal of Public Health*, (suppl.2), 236-242.
- Larson, E.L., Ferng, Y., Wong-McLoughlin, J., Wang, S., Haber, M., & Moss, S.S. (2010). Impact of non-pharmaceutical interventions on URIs and influenza in crowded, urban households. *Public Health Report*, 125 (2), 178-191.
- Marshall, H., Ryan, P., Robertson D., Street J., & Watson, M. (2009). Pandemic influenza and community preparedness. *American Journal of Public Health*, 99 (S2), 365-371.
- Ministry of Public Health. (2009a). *Situation, policy, mission, and guideline of prevention and control of Swine Flu A (H1N1) 2009*. Retrieved June 20, 2011 from http://beid.ddc.moph.go.th/th/index.php?option=com_content&task=view&id355408
- Ministry of Public Health. (2009b). *Policy and practice guideline for H1N12009 vaccination which informed by WHO experts*. Retrieved June 20, 2011 from http://beid.ddc.moph.go.th/th/index.php?option=com_content&task=view&id
- Mitty, E. (2009). Infection control practices in assisted living communities. *Geriatric Nursing*, 30(6), 417-423. *Institutions take precautions against swine flu*. (2009). Wiley periodicals, inc, A Wiley Company: DOI 10, 1002/tsr
- Panchalee (2009, July 22). *Situation of swine flu (H1N1) 2009*. Message post to <http://panchalee.wordpress.com>
- Public Health Agency of Canada. (2009). H1N1 infection prevention and control measures. *Alta RN*, 65 (8), 26-27.
- Stevenson, E., Barrios, L., Cordell, R. Delozier, D. Gorman, S. Koenig, L.J., et al. (2009). Pandemic influenza planning: Addressing the needs of children. *American Journal of Public Health*, 99 (S2), 255-260.

Talking to children about swine flu (H1N1). (2009). *The Brown University Child and Adolescent Behavior Letter*. Wiley Periodicals: A Wiley Company.

WHO. (2010). *Pandemic (H1N1) 2009-update 99; 2010*. Retrieved June 20, 2011 from http://www.who.int/esr/don/2010_05_07/en/index.html