



# The Effectiveness of Liver Fluke Prevention Behaviors Program among Ordinary People in Tao-Ngoi District, Sakon Nakhon Province, Thailand

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**Abstract** Liver fluke disease (henceforth LFD) in North-East region community remains the significant public health problem in Thailand. It is necessary to carry out disease measures to establish a good prevention practice for ordinary people to reduce the incidence of LFD and cholangiocarcinoma. This quasi-experimental research aimed to study the effectiveness of the Liver Fluke Prevention Behaviors Program (henceforth LFPBP). The study samples included 108 ordinary people from Tao-Ngoi District, Sakon Nakhon Province. The samples were randomly selected into the experimental and the control group. There were 54 people in each group equally. The experimental group received the LFPBP designed by the researcher. The questionnaire was used to collect data. Percentage, mean, standard deviation, independent t-test and paired t-test were used to analyze the data. The findings revealed that the experimental group had higher perceived susceptibility of LFD, perceived severity of the LFD, benefits of liver fluke prevention behaviours, cues to action of liver fluke prevention behaviours and self-efficacy on practising liver fluke prevention behaviours than before participating in the program. Also, it showed that the experimental group has statistical significance (.05) than those in the control group. On the other hand, after participating in the program, the subjects in the experimental group reduced the perceived barrier of the liver fluke prevention behaviours than the baseline and then those in the control group at a .05 statistical significance level. In conclusion, the Liver Fluke Prevention Behaviors Program is effective. The local organization in the North-East region, who face with LFD and the cholangiocarcinoma can implement the program in their provinces, in order to promote liver fluke prevention behaviours to the ordinary people.

**Keywords** health belief model, liver fluke disease (LFD), prevention behaviour, health program modification

## INTRODUCTION

The World Health Organization has classified Liver Fluke Disease (*Opisthorchis viverrini*) as a carcinogen causing the highest rate of cholangiocarcinoma in the world and has been an essential problem of Ministry of Public Health for more than 100 years. Cholangiocarcinoma is found predominantly in the north-eastern part of the country making Thailand still the country with the highest incidence of cholangiocarcinoma in the world. Cholangiocarcinoma is one of the leading causes of death in Thailand, 14,000 persons per year, and more than half of those numbers are the population from northeastern Thailand (Department of Disease Control, Ministry of Public Health, 2016). The information from previous disease surveillance indicated that patients suffered from

LFD were accounted for 0.40 of morbidity rate per one hundred thousand populations. Five provinces in northeastern Thailand have a high rate of live fluke incidence. The prevalence rate occurred per 100,000 people of LFD infection were from Sakon Nakhon (15.38), Khon Kaen (4.60), Sa Kaeo (0.18), Nakhon Phanom (0.14), Mukdahan (0.03), see also statistical results from Department of Disease Control, Ministry of Public Health in 2017. Recent evidence suggests that prevalence of LFD in the north-eastern part of Thailand is very high due to the long tradition of consuming fresh-water fish or improperly cooked fish (Rangsin et al., 2009).

It has previously been observed that LFD is still a significant problem which must be urgently solved. Several attempts have been made to address the problem since 1987, the LFD still exists. Probably, it can be said that the operation in previous days was passive instead of proactive to target groups in communities (Ministry of Public Health, Khon Kaen University and National Health Security Office, 2013). In this regards, initiation of the strategy for controlling eating habits of raw fresh-water and improperly cooked fish should be emphasized. For example, education to the people of a high prevalence of liver fluke infection and the long-term consequences of the disease are welcome. It should also bring about the perception of risks in having the disease, severity of the disease, benefits for practices, and barrier for practices. This will, in turn, influence behavior changing of individuals. Since belief in individuals' capability and persuasion to practices can foster people to have sustainable behaviour in preventing LFD and it is consistent with the Health Belief Model (Becker and Maiman, 1974). Therefore, this paper attempts to apply Health Belief Model (HBM) to modify people's behaviour in preventing LFD, and it can lead to problem-solving and a guideline for developing a scheme to prevent LFD sustainably. This paper begins by stating the objectives and methodology. It will then go on to results and discussion and conclusion.

## **OBJECTIVES**

This study, therefore, set out to assess the effect of LFPBP with the application of Health Belief Model to modify people's behaviour in preventing LFD in Tao-Ngoi District, Sakon Nakhon Province, Thailand.

## **METHODOLOGY**

### **Research Design**

This study is a quasi-experimental research design. There were two groups of the sample; an experimental group and a comparison group (pre-test and post-test). The population in the research is ordinary people aged between 20 to 60 years who have their names in house registration and live in Tao-Ngoi District, Sakon Nakhon Province. The sample size is determined by calculation to make a comparison of the difference in means of two groups of the independent population (Jirakun, 2004). References are made to the study result of an application of the health belief model with the integration of participatory learning process for behavioural modification to prevent LFD (Chanthakhuembong, Songkasri & Rattanasang, 2014). There are 54 persons in each sample group from 2 villages of Tao-Ngoi District, Sakon Nakhon Province. The criteria selected of the sample are (1) being a large size village, (2) a village share similar aspects of social, economic, and context, and (3) good collaboration of community leaders. Simple random sampling is used to find out a village in the experimental group and a village in the comparison group. By using a random sampling method, I can select the sample who join the program throughout the research voluntarily.

### **Research Instruments**

There are two parts of instruments; instrument used in an experiment and instrument used for data collection according to the following details:

**Part 1:** The instrument used in an experiment is the LFPBP with the application of the health belief model that the researcher is developed. Village Health Volunteers (VHVs) are assigned to manage the learning process for people through the integration of home visit activity; 2 times for every two weeks. The 1st activity is “Fear with liver fluke”, and the 2nd activity is “You can visit them.” Emphasis is placed on giving news, knowledge sharing with people, presentation of the model, follow-up and evaluation with the use of flip charts and people’s manual on LFD prevention.

**Part 2:** Questionnaire was designed to measure the participants' attitudes towards the effect of LFPBP and comprised of eight parts. Questions in the first part concern general information of the sample, while the questions in part two and three asked participants to rate perceived susceptibility of LFD and severity of the LFD. The third and fourth part of the questionnaire asked participants to rate the perceived benefits of liver fluke prevention behaviours and the perceived barrier of the liver fluke prevention behaviours. The rest of the questionnaire (part 6-8), participants were asked to respond cues to action of liver fluke prevention behaviours, self-efficacy on practising liver fluke prevention behaviours, and liver fluke prevention behaviours. Inter-rater reliability was also employed by five experts. The reliability of the questionnaires was .889 which considered acceptable.

### **Ethical Approval**

Ethical approval was obtained from the Human Research Ethics Committee, Boromarajonani College of Nursing Changwat Nonthaburi, Nonthaburi, Thailand. (COA No. 5/2557 (2014) approved dated 2014/May/30).

### **Data Analysis**

Descriptive statistics; frequency; percentage; means, and standard deviation, is used for data analysis of the sample and inferential statistics; Paired t-test and Independent t-test, is used to compare means.

## **RESULTS AND DISCUSSION**

The data analysis indicated that the sample was divided into 54 persons for an experimental group, and 54 persons for a comparison group. All of them were between 46-60 years of age; female; married; with primary school education level; and they were farmers. Most of them had a history of stool examination for finding LFD.

According to the experimental group's post-test results, we can see that the mean scores by the components of the Health Belief Model; perceived susceptibility, perceived severity, perceived benefits, cues to action, and self-efficacy was higher than the pre-test with a statistical significance ( $p < .001$ ). It also indicated that perceived barrier was lower than the pre-test with a statistical significance ( $p < .001$ ). Meanwhile, prevention behaviours were higher than the pre-test with a statistical significance ( $p < .001$ ). Concerning the comparison group, a factor difference between the pre-test and post-test was self-efficacy (see Table 1). The results obtained from the analysis of components of the Health Belief Model and liver fluke prevention behaviours of the two groups of participants showed no difference. Interestingly, factors in the Health Belief Model and liver fluke prevention behaviours of the experimental group was observed to be better than the comparison group with a statistical significance ( $p < .001$ ) (see also Table 2).

The most striking result to emerge from the data is that liver fluke prevention program with the application of the Health Belief Model was effective. In the post-test, the results of the respondents in the experimental group related to the components of the Health Belief Model and liver fluke prevention behaviours is significant at the  $p < .001$  level higher levels of the comparison group.

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**Table 1 Comparison of means of variables in the experimental and comparison groups before and after the operation by LFPBP**

Variables	Experimental Group )n=54(						Comparison Group )n=54(					
	Before		After		t	P value	Before		After		t	P value
	Mean	S.D.	Mean	S.D.			Mean	S.D.	Mean	S.D.		
perceived susceptibility	61.82	3.94	67.58	4.90	10.763	<.001	61.73	5.59	61.39	5.26	0.534	.597
perceived severity	23.29	2.85	25.25	3.38	5.980	<.001	22.92	2.52	23.07	2.73	0.558	.578
Perceived benefits	28.52	2.88	30.38	3.13	5.347	<.001	27.92	2.99	28.28	2.85	1.119	.265
perceived barrier	25.00	4.54	23.57	4.75	2.640	<.001	25.43	4.20	25.14	4.80	0.607	.545
cues to action	29.89	3.51	32.24	3.65	5.606	<.001	29.85	3.09	29.82	3.52	0.067	.947
self-efficacy	34.22	5.13	41.13	4.90	12.217	<.001	34.33	5.80	31.63	4.66	3.734	<.001
prevention behaviors	36.32	6.77	44.99	4.42	12.776	<.001	35.25	6.82	36.08	6.14	1.333	.185

**Table 2 Comparison of means of variables before and after the operation under LFPBP between the experimental and comparison groups**

Variables	Before the experimentation )n=108(					After the experimentation )n=108(						
	Experimental		Control		t	P value	Experimental		Control		t	P value
	Mean	S.D.	Mean	S.D.			Mean	S.D.	Mean	S.D.		
perceived susceptibility	61.82	3.94	61.73	5.59	0.147	.833	67.58	4.90	61.39	5.26	9.443	<.001
perceived severity	23.29	2.85	22.92	2.52	0.792	.429	25.25	3.38	23.07	2.73	5.754	<.001
Perceived benefits	28.52	2.88	27.92	2.99	1.561	.120	30.38	3.13	28.28	2.85	5.418	<.001
perceived barrier	25.00	4.54	25.43	4.20	0.752	.453	23.57	4.75	25.14	4.80	2.556	.011
cues to action	29.89	3.51	29.85	3.09	0.098	.922	32.24	3.65	29.82	3.52	5.225	<.001
self-efficacy	34.22	5.13	34.33	5.80	0.165	.869	41.13	4.90	31.63	4.66	15.377	<.001
prevention behaviors	36.32	6.77	35.25	6.82	1.226	.221	44.99	4.42	36.08	6.14	12.900	<.001

This study is aligned with the study of Health Belief Model from Becker and Maiman (1974). They stated that preventive health behaviour was not expressed until a person believed that disease was so severe and could destroy or do harm to health. Then, that person would decide to have better behaviour to prevent disease. In the meantime, how a person would choose to practice depended on the readiness of body and mind as well as a belief that would be useful or barrier for the practice. In terms of methods, it must be something that they believe they would give them the

most benefit and had the least barrier including persuasion for practice. Bandura (1986) suggested that the way individuals believed in their capability, which meant the way that individuals decide their capability to manage and take action to reach their set goals, and it would drive them to express the desired behaviour. The current study found that there were changes in intrapersonal factors according to the six components of Health Belief Model with different methods through individuals who are close to people and be able to share the same context can drive people to behave and modify their desired behaviour to prevent LFD accordingly.

## CONCLUSION

This study has shown that behavioural modification in preventing LFD by developing LFPBP with the application of the Health Belief Model enables people to modify their desired behaviour in preventing liver fluke. The results of this study indicate that related public health agencies in areas where LFD is a problem should take such program into practice by integrating with the routine work of agencies and applying to fit with the context of people and society for sustainability accordingly.

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