

RESEARCH ARTICLE

Nurses and Television as Sources of Information Effecting Behavioral Improvement Regarding Liver Flukes in Nakhon Ratchasima Province, Thailand

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Abstract

Background: Liver fluke infection with *Opisthorchis viverrini* and its associated cholangiocarcinoma constitute a serious problem in Thailand. Healthy behavior can decrease infection, therefore, the investigation of knowledge, attitude, and practice is need required in high risk areas. **Objective:** This study aimed to investigate the behavior and perceptions regarding liver fluke. **Materials and Methods:** A cross-sectional descriptive study was conducted in Chum Phuang district of Nakhon Ratchasima province, Thailand during July to November 2015. A total 80 participants who had screened with verbal screening test, stool examination, and ultrasonography, were purposive selected and completed a pre-designed questionnaire (Kruider-Richardson-20=0.80, Cronbach's alpha coefficient=0.82 and 0.79). T-test, ANOVA, and Pearson correlation test were used for analyzed data. **Results:** The results reveal that *O. viverrini* infection was 1.25%, and 3 patients had a dilated bile ducts. The participants had a high knowledge, attitude, and practice regarding liver fluke. The education, occupation, and income, were statistical significant to attitude regarding liver fluke. Nurses and television were the main sources of information regarding liver fluke, with statistical significance (p-value <0.05). Knowledge was significantly associated with attitude and practice (p-value<0.05). **Conclusions:** Participants had good behavior regarding liver fluke. Improvement of knowledge and attitude is influenced to practical change regarding this carcinogenic fluke. In addition, nurse and television are the main information resources for key success in increasing people perception for disease prevention and control in this area.

Keywords: Nurses - television - health behavior - liver fluke - Thailand

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Introduction

Liver fluke caused by *Opisthorchis viverrini*, is a serious problem in Thailand particularly in the northeast and north region (Kaewpitoon et al., 2008b; Sitthithaworn et al., 2012; Sripa et al., 2012; Wongsaroj et al., 2014; Kaewpitoon et al., 2015). Recently, the current status of liver fluke infection in Thailand was reported, a nationwide survey prevalent was 5.1%. The highest of prevalent was found in the northeast (9.2%) and followed by the north region (5.2%). A total of 1,168 stool samples were obtained from 516 males and 652 females. Stool examination showed that 2.48% were infected with *O. viverrini* (Kaewpitoon et al., 2012c).

The experimental and epidemiological evidences

strongly indicated that *O. viverrini* infection is the etiology of cholangiocarcinoma (CCA) (Thamavit et al., 1978; IARC, 1994; Sripa et al., 2007), and CCA has been reported that Thailand is the highest incident of the world (Green et al., 1991; Sripa, et al., 2007; Kaewpitoon et al., 2008a; Shin, et al., 2010). CCA was the caused of death in Thai population and found that CCA was ranked 4 in male and 5 in female (Sripa and Pairojkul, 2008). Mortality rate of CCA in Thailand was approximately 36.48% (Sripa et al., 2012). The mortality rate of CCA in Nakhon Ratchasima province, Thailand was ranked between 13.67-16.2 (Sripa et al., 2010).

Behavior on prevention and control of liver fluke infection are essential for decreasing the liver fluke infection. Previously studied indicated that knowledge,

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attitude, and practice related to liver fluke infection in rural communities (Kaewpitoon et al., 2007). Therefore, the current status of health behavior and information resources is need required. This study aimed to investigate the knowledge, attitude, and practice regarding liver fluke, including the information resources for this disease. The result may useful for further study and planning of liver fluke prevention and control.

Materials and Methods

A cross-sectional descriptive study was approved by the human research ethics committees of Suranaree University of Technology, 2015 (EC58-48). The study was conducted in Chum Phuang district, Nakhon Ratchasima province, Thailand during July to November 2015. Chum Phuang is a district in the eastern part of Nakhon Ratchasima province, neighboring districts are (from the north clockwise) Prathai, Mueang Yang and Lam Thamenchai of Nakhon Ratchasima Province, Lam Plai Mat of Buriram province, and Huai Thalaeng and Phimai of Nakhon Ratchasima again. The district is subdivided into 9 sub-districts, and 130 villages. This district is coverage areas 540.6 km² (208.7 sq mi), and has 82,161 populations.

Multi-stage sampling was used to select the participants in this studied. Briefly, total of 29,385 populations from 82,311 populations was selected with criteria of aged ≥30 years old. Populations were screened for CCA by using mini-verbal screening questionnaire contained the history with (1) opisthorchiasis; definitive diagnosed by medical doctor or related officers, (2) under-cooked fish consumption, (3) praziquantel used; given by medical doctor or related officers, (4) cholecystitis; definitive diagnosed by medical doctor or related officers, (5) relative family with cholangiocarcinoma, (6) naïve northeastern people, (7) agriculture, and (8) alcohol consumption. 80 participants (who had stool examination with Mini-Parasep SF concentration technique and abdomen ultrasonography), were participated and completed the pre-designed questionnaires. The questionnaire was comprised 5 domain included (1) demographic data; gender, age, education, agriculture, and income, (2) knowledge; 15 questions, (3) attitude; 20 questions, and (5) practice; 15 questions. Reliability and validity of questionnaire was analyzed, knowledge (Kruider-Richardson-20) = 0.80, attitude and practice (Cronbach's alpha coefficient) = 0.82 and 0.79, respectively.

Evaluation of knowledge level was analyzed according to Bloom (1971), answer correct=1, incorrect=0, and interpreted to high level; 11-15 points, moderate level; 6-10 points, 0-5 points; low level. Evaluation of attitude level was analyzed according to Likert (1932) with 3 choice (agree, not sure, dis-agree): positive question=3,2,1, negative question=1,2,3, and interpreted to good level; 48-60 points, moderate level; 36-47 points, and low level; 0-35 points. Evaluation of practical level was analyzed according to Best (1977) with 3 choice (frequently, sometimes, never): positive question=3,2,1, negative question=1,2,3, and interpreted to good level; 36-45 points, moderate level; 27-35 points, poor level;

Table 1. Demographic data and Knowledge, Attitude and Practice regarding liver fluke

Variables	N	Knowledge		T, F	p-value	Attitude		T, F	p-value	Practice		T, F	p-value
		Mean	S.D.			Mean	S.D.			Mean	S.D.		
Gender	Male	49	12.47	1.67	0.971	54.9	4.62	T=-1.474	0.145	39.1	3.66	T=-2.448	0.017
	Female	31	12.42	1.73		56.35	3.75			41.26	4.11		
Age	31-40 years	11	13.09	1.81	0.188	57	3.07	F=1.390	0.252	41.91	3.05	F=1.655	0.184
	41-50 years	22	12.68	1.73		55.41	4.38			39.95	3.17		
	51-60 years	31	12.42	1.54		55.84	4.54			39.97	3.56		
Education	>60 years	16	11.75	1.69		53.75	4.43			38.5	5.63		
	Primary school	55	12.05	1.64	0.001	54.44	4.49	T=-3.858	0	39.36	4.24	T=-1.958	0.054
	Secondary School and Higher	25	13.32	1.46		57.72	2.99			41.2	2.96		
Occupation	Not Agriculture	7	12.86	1.57	0.506	59.71	0.49	T=8.646	0	41.29	3.09	T=0.943	0.349
	Agriculture	73	12.41	1.7		55.05	4.33			39.81	4.02		
Income	< THB 5,000	38	12.08	1.85	0.126	54.13	5.03	F=4.163	0.019	38.82	4.4	F=3.075	0.052
	THB 5,000 - 10,000	20	13	1.41		56	3.54			40.85	2.85		
	> THB 10,000	22	12.59	1.5		57.27	2.83			41.05	3.62		

Table 2. A comparison between perceive and information resources regarding liver fluke, classified by human

Perceive resources	n	Knowledge				Attitude				Practice			
		mean	S.D.	T	p-value	mean	S.D.	T	p-value	mean	S.D.	T	p-value
Head village													
yes	14	12.93	1.86	1.174	0.244	55.57	4.29	0.103	0.918	39.71	4.76	-0.231	0.818
no	66	12.35	1.64			55.44	4.38			39.98	3.8		
Village health volunteer													
yes	48	12.67	1.6	1.419	0.16	55.9	4.35	1.095	0.277	40.23	3.53	0.806	0.423
no	32	12.13	1.77			54.81	4.31			39.5	4.54		
Public health officer													
yes	17	12.82	1.67	1.032	0.305	56	4.47	0.573	0.568	41.29	2.39	2.189	0.034
no	63	12.35	1.69			55.32	4.33			39.57	4.22		
Neighbor													
yes	4	13.25	2.06	0.975	0.333	58.25	2.22	1.324	0.189	37.75	6.75	-1.137	0.259
no	76	12.41	1.67			55.32	4.38			40.05	3.79		
Member of sub-district administrative organization													
yes	2	14	1.41	1.325	0.189	57	1.41	0.505	0.615	43.5	3.54	1.295	0.199
no	78	12.41	1.68			55.42	4.39			39.85	3.94		
Nurse													
yes	13	13.54	1.39	2.643	0.01	57.54	2.47	2.817	0.008	42.46	1.9	4.161	0.000
no	67	12.24	1.66			55.06	4.52			39.45	4.07		
Medical doctor													
yes	10	12.9	1.85	0.903	0.369	57.2	3.36	1.361	0.178	40	2.83	0.053	0.958
no	70	12.39	1.66			55.21	4.43			39.93	4.11		

0-26 points. Descriptive and analytical statistics were used for analyzed in this study. T-test and ANOVA were used for analyze the difference between demographic data, information resources and behavior. Pearson correlation test was used for analyzed the association of knowledge, attitude, and practice.

Results

The majorities of participants were male, age between 51-60 years old, education level of primary school, agriculture, and had income <5,000 baht. The infection rate of intestinal helminthes was 4.60%, and it was classified to *Strongyloides stercoralis* 2.5%, *O. viverrini* 1.25%, Hookworm 1.25%, and *Taenia* spp (1.25%). CCA was screened, 3 patients from 80 participants had a dilated bile ducts (figure 1). The participants had a high knowledge, good attitude, and good practice regarding liver fluke.

Knowledge was statistical significant different in the educational level (T=3.307, p-value=0.001). The participants had a high knowledge, attitude, and practice regarding liver fluke (Table 1). A comparison between demographic data and behavior regarding liver fluke was analyzed and found that attitude was statistical significant to educational level (T=3.858, p-value=0.000), occupation (T=8.464, p-value=0.000), and income (T=4.163, p-value=0.019). In addition, practice was statistical significant to gender (T=-2.448, p-value=0.017) (Table 1).

A comparison between perceive and information resources regarding liver fluke, was analyzed and found that nurse had a statistical significant to knowledge (T=2.643, p-value=0.01), attitude (T=2.817, p-value=0.008), and practice (T=4.161, p-value=0.000). In addition, public

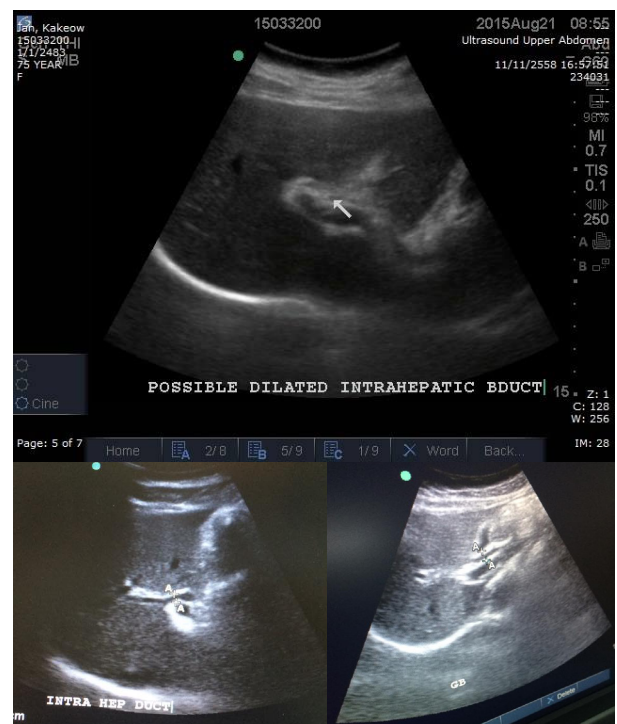


Figure 1. Bile Ducts with Dilation in 3 Patients from Chum Phuang district, Nakhon Ratchasima province, Thailand

health officer had a statistical significant to practice (T=2.189, p-value=0.034). Meanwhile, medical doctor, member of sub-district administrative organization, and neighbor, had not statistical significant to knowledge, attitude, and practice (Table 2). Television was a statistical significant to knowledge (T=2.377, p-value=0.02), attitude (T=3.167, p-value=0.002), and practice

Table 3. A Comparison Between Perceive and Information Resources Regarding Liver Fluke, Classified by Media

Perceive resources	n	Knowledge				Attitude				Practice			
		mean	S.D.	T	P-value	mean	S.D.	T	P-value	mean	S.D.	T	P-value
Village news station													
yes	28	12.18	1.47	-1.059	0.293	54.82	5.19	-0.885	0.381	40.14	4.08	0.339	0.736
no	52	12.6	1.79			55.81	3.82			39.83	3.92		
Pamphlet													
yes	15	13.73	1.16	3.502	0.001	58.4	1.88	4.903	0	41.67	2.79	1.909	0.06
no	65	12.15	1.65			54.78	4.47			39.54	4.09		
Poster													
yes	3	14	1.73	1.643	0.104	59.67	0.58	7.322	0	42.67	1.15	1.222	0.226
no	77	12.39	1.66			55.3	4.34			39.83	3.99		
Television													
yes	35	12.94	1.73	2.377	0.02	57.03	2.94	3.167	0.002	41.06	2.61	2.445	0.017
no	45	12.07	1.56			54.24	4.87			39.07	4.59		
Newspaper													
yes	8	13.5	1.51	1.89	0.062	59.38	0.74	7.535	0	42.25	2.87	1.766	0.081
no	72	12.33	1.67			55.03	4.36			39.68	3.99		
Internet													
yes	3	13.67	1.53	1.281	0.204	59.67	0.58	7.332	0	43	1	1.374	0.173
no	77	12.4	1.68			55.3	4.34			39.82	3.98		

Table 4. Correlation between Knowledge, Attitude and Practice Regarding Liver Flukes

Variables	Knowledge	Attitude	Practice
Knowledge	-	0.377**	0.261*
Attitude		-	0.554**
Practice			-

*Correlation is significant at the 0.05 level (2-tailed); **Correlation is significant at the 0.01 level (2-tailed).

($T=2.445$, $p\text{-value}=0.017$). Pamphlet was a statistical significant to knowledge ($T=3.502$, $p\text{-value}=0.001$) and attitude ($T=4.903$, $p\text{-value}=0.000$). In addition, the internet ($T=7.322$, $p\text{-value}=0.000$) and poster ($T=7.322$, $p\text{-value}=0.000$) were a statistical significant to attitude. Meanwhile, village news station and newspaper were not statistical significant to knowledge, attitude, and practice (Table 3).

A correlation between knowledge, attitude, and practice was analyzed and found that knowledge was statistical significant associated to attitude ($r=0.377$, $p\text{-value}<0.05$) and practice ($r=0.261$, $p\text{-value}<0.05$). In addition, attitude was statistical significant associated to practice ($r=0.554$, $p\text{-value}<0.01$) (Table 4).

Discussion

Liver fluke infection caused by *O. viverrini* remains a major public health problem in many parts of Southeast Asia including Thailand, Lao PDR, Vietnam and Cambodia (IARC, 1994; Sripa et al., 2010). Infection is acquired by ingestion of undercooked cyprinoid's fish harboring infective metacercariae (Kaewkes 2003). Liver fluke is endemic among human populations in northeast and north Thailand, where the most common raw fish "Koi pla" is frequently consumed (Sadun 1955; Harinasuta and

Vajrasthira 1960; Wykoff et al., 1965; Preuksaraj et al., 1982). Recent study, we found that *O. viverrini* infection was 1.25%, this result is lower than the previously survey in 2012. A total of 1,168 stool samples from Nakhon Ratchasima, Thailand were examined found that 2.48% were infected with *O. viverrini* and the infection rate was 2.78% in Chum Phuang district (Kaewpitoon et al., 2012c). The high mortality rate of CCA was reported in the northeast areas where found frequently of *O. viverrini* infection (Sripa et al., 2010). Mortality rate of liver cancer and *O. viverrini* infection rate in different regions of Thailand has been reported and found that Nakhon Ratchasima province has 13.67-16.2 per 100,000 populations. Recent study shows that 3 patients from 80 participants had a dilated bile ducts, this finding indicates that CCA is still a problem in this area.

Improvement of health behavior regarding liver fluke prevention and control is need required. Here we investigated the behavior of rural people and found that the majorities of participants were male, age between 51-60 years old, education level of primary school, agriculture, and had income <5,000 baht. This recent results is similar to that several approaches for reducing opisthorchiasis-linked CCA. All participants were 30-69 years of age. Of all the participants, more than 60% had regularly participated in activities to prevent CCA following health official advice. Age and health behavior to prevent CCA were factors associated with community participation for CCA ($p<0.001$) (Songserm et al., 2015). Our finding indicates that knowledge was statistic significant different in educational level, occupation, and income to attitude regarding liver fluke. Furthermore, gender was statistical significant to practice. This is similarly to that previously studied in Ubonratchathani province found that knowledge, attitude, and practice related to their demographic data particularly gender,

education, and occupation (Kaewpitoon et al., 2007). Therefore, improvement of behavior regarding liver fluke, should be approaches in the group of male, age >40 years old, agriculture, and lowest income. A perceive of liver fluke severities, transmission, sign and symptom, related diseases, diagnosis, treatment, prevention and control, is a key for success to decrease the infection in risk areas. Other finding suggested that through participating in health education program. Participants learned the life cycle of liver fluke. They talked about this within their families, and communicated as well as cooperated with others to strengthen a network of a club concentrating on not eating raw fish. The communities and the Sub-district Administrative Organization supported the project. It is advisable to improve the behavior of participants in villages so that they became aware how to prevent and control liver fluke infection and therefore the development of CCA (Wongba et al., 2011). Recent study indicates that participant had a high perceive of information about this disease (73.75%). The main resources were nurse and television particularly nurse had a statistical significant to improve people knowledge, attitude, and practice regarding liver fluke, followed by public health officer who can improve the practicum of people. Therefore, cooperation between nurse and public health officer are useful for increase the healthy practicum regarding liver fluke prevention and control. Furthermore, television was the main information resources regarding liver fluke, followed by pamphlet, internet, and poster. Therefore, further health education should be promoted via television. Periodic researches like knowledge, attitude, and practice studies can contribute to the understanding alluded to above. KAP studies are highly focused evaluations that estimate changes in human knowledge, attitude and practices in response to specific intervention, demonstration, education or circumstances (Shah et al., 2011). Here we present a correlation between knowledge, attitude, and practice was reveals that knowledge was statistical significant associated to attitude and practice, and attitude was statistical significant associated to practice. From this data indicates that decrease the liver fluke infection in this area should be health education approaches improve people knowledge and attitude that may affect to increase good practice of them.

In conclusion, the behavioral rate of liver fluke of participants was relatively high, and the formation rates of health behaviors and right attitude were relatively high. In addition, nurse and television are the main resources for a key success to increase people perceive of disease prevention and control in this area.

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