

*Effect of health education on health perception and preventive health behavior of populations at risk of cholangiocarcinoma in Si Samran subdistrict, Porncharoen district, Bueng Kan province, Thailand.*

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**Abstract**

People in Si Samran subdistrict, Porncharoen district, Bueng Kan province lacked awareness, perception of risk and severity of cholangiocarcinoma (CCA). They still ate raw fish or other menu cooked with raw fish. Therefore, CCA prevention campaign should be done to enhance awareness and perception to reduce raw fish consuming behaviors. This study aimed to evaluate the effect of health education to populations at risk of CCA in Si Samran subdistrict by comparing health perception and preventive health behaviors before and after receiving health education. This study recruited 76 participants to attend the health education for stop eating raw fish workshop. The workshop was applied based on theory of Health Belief Model (HBM) and the activities comprised lecture of 1) signs and symptoms of CCA 2) risk factors of CCA 3) benefits of CCA prevention and group discussion about CCA preventive behaviors and barriers of behavior modification. Data were collected with questionnaire before and 3 month after workshop. Descriptive statistics were used to describe personal demographic data, level of health perception regarding CCA and level of CCA preventive behaviors. Inferential statistics (paired samples t-test) were used to compare level of health perception regarding CCA and level of CCA preventive behaviors before and after workshop. The results showed that majority of 76 participants were female (68.4%), age group 40-50 years old (51.3%), married (89.5%), finished primary school (76.3%), employed in agriculture (61.8%), and had income more than 10,000 bath/month (40.8%). Participants had higher level of 3 parts of health perception regarding CCA after workshop, including perceived susceptibility, perceived severity and perceived barriers but demonstrated lower level of many CCA preventive behaviors. Hence, health education should be focused on elimination of obstacles or barriers which obstructed the behavior modification.

**Keywords** health education, health perception, preventive health behavior, cholangiocarcinoma

## **Introduction**

Cholangiocarcinoma (CCA), also known as bile duct cancer, is one of the most cancers prevalent in northeastern region of Thailand. The incidence rate was 5 per 100,000 populations and the death toll was approximately 14,000 per year.<sup>1</sup> It has been already known that *Opisthorchis viverrini* (OV) infection is the major cause of CCA particularly in northeastern Thailand. Previous studies revealed that raw fish consuming behavior associated with OV infection leading to CCA. Thailand had the highest incidence of CCA in the world in 1988-1989.<sup>2,3</sup> The types of raw fish dish which are popular in northeastern region include, for example, raw fermented fish (Pla Ra), raw fish in spicy condiment (Koi Pla), raw spicy minced fish salad (Lahb Pla), raw pickled fish (Pla Som), raw pickled small fish (Pla Jom).<sup>4,5</sup>

Bueng Kan is one of provinces in northeastern region of Thailand that has many cases of CCA. The distribution during 2012 – 2014 was reported as follow; the incidence rates were 42.76, 40.86, 41.46 per 100,000 populations and the mortality rates were 17.92, 23.41, 19.65 per 100,000 populations respectively. Likewise, in Porncharoen district, Bueng Kan province, cases of CCA were reported as follow; the incidence rates during 2012 – 2014 were 87.70, 66.37, 82.64 per 100,000 populations and the mortality rates were 30.81, 42.67, 69.72 per 100,000 populations respectively. In addition, new cases during 2012 – 2014 were 54, 22 and 21 respectively.<sup>6</sup> This report showed that the incidence and mortality rates in Porncharoen district were higher than the rates in Bueng Kan province and new patients still occurred every year as well. Thereby, CCA accounted for the major public health problem in Porncharoen district.

Si Samran subdistrict is situated in Porncharoen district, Bueng Kan province. OV infection in this area was one of the highest prevalence in Bueng Kan province. Findings of stool examination in 2011 revealed that OV eggs were found in 10 samples from all 60 samples (16.67%). Furthermore, since the CCA ultrasonography screening campaign had been launched in 2015, populations at risk in Si Samran subdistrict were recruited for this campaign accounting for total 397 subjects. 185 showed ultrasonographic abnormalities (46.6%). Most of abnormal findings were periductal fibrosis (PDF) (120 subjects, 30.2%) and fatty liver (62 subjects, 15.6%).<sup>7</sup> OV infection evidently causes PDF that is the major risk factors leading to CCA. It has already known that raw fish consuming causes OV infection, but people in northeastern Thailand love to eat since they were young and some still continue eating until present.<sup>3</sup> The lack of awareness as well as perception of risk and severity of the disease was important factor leading to maintain risk behaviors. Therefore, the CCA prevention campaign should be done continuously to enhance awareness and perception of risk and danger of this disease in order to reduce raw fish consuming behaviors. This means that CCA in this area will likely decline in future.<sup>8</sup>

Porncharoen hospital cooperating with Si Samran subdistrict health promotion hospital conducted “Stop eating raw fish” campaign for people in Si Samran subdistrict in order to reduce risk of CCA. Populations at risk were recruited for ultrasonography screening. They had received health education before ultrasound examination. This study aimed to evaluate the effect of health education to populations at risk of CCA in Si Samran subdistrict, Porncharoen district, Bueng Kan province by comparing health perception and preventive health behaviors before and after receiving health education.

## ***Materials and Methods***

This study was a quasi-experimental research; one group pre-test and post-test design was applied in Si Samran subdistrict, Porncharoen district, Bueng Kan province, Northeastern region of Thailand during the period November, 2016 – March, 2017.

### ***Population and sample***

The study populations were people who live in Si Samran subdistrict and had risks of CCA screened by using CASCAP (Cholangiocarcinoma Screening and Care Program) CCA screening criteria as follow<sup>9</sup>; they are typical northeast Thai aged of 40 years and over with any one or more of the following; 1) ever been infected by liver fluke or 2) ever been treated with praziquantel or 3) ever consumed raw freshwater fish with scales or 4) have family history with CCA. A total of populations were 1,495. This study recruited only 76 participants by purposive sampling technique to enroll ultrasound screening for CCA and attend health education for stop eating raw fish workshop. These 76 participants were the pilot group of the program aimed to gain accurate perception regarding CCA, modify behaviors, and then disseminate correct knowledge to other people in their communities.

### ***Data collection***

All target participants had attended health education workshop, after that, they underwent ultrasound examination for CCA screening by trained physician. The health education workshop was applied based on theory of Health Belief Model (HBM). The main constructs of the HBM comprise: 1) perceived threat, which consists of A) perceived susceptibility: a person's subjective perception of the risk of acquiring a disease and B) perceived severity: a person's feelings about the seriousness of contracting a disease; 2) perceived benefits: a person's perception of the effectiveness of various actions available to reduce the threat of a disease; 3) perceived barriers: a person's belief about the potential negative aspects of taking a particular health action; and 4) cue to action: internal or external cues that determine a person's readiness for action and trigger the decision-making process.<sup>10</sup> In this workshop, 4 constructs were selected for training including perceived susceptibility, perceived severity, perceived benefits, and perceived barriers.

The workshop activities comprised lecture of 1) signs and symptoms of CCA 2) risk factors of CCA 3) benefits of CCA prevention and group discussion about CCA preventive behaviors and barriers of behavior modification.

This study was implemented for 3 months. Pre-and post-test were measured. Data were collected with questionnaire consisted of 3 parts: 1) personal demographic data 2) perceived susceptibility, perceived severity, perceived benefits, and perceived barriers 3) CCA preventive behaviors. The instrument in this study was adopted from Sangprach's questionnaire<sup>11</sup> which had been already tested for reliability. (Overall Cronbach's alpha coefficient = 0.89) Participants had to answer questionnaire before attending the workshop and 3 month after that they had to do it again to evaluate the improvement.

### *Data analysis*

Descriptive statistics were used to describe personal demographic data, level of health perception regarding CCA and level of CCA preventive behaviors with frequency, percentage, mean and standard deviation. Inferential statistics (paired samples t-test) were used to compare level of health perception regarding CCA and level of CCA preventive behaviors before and after attending the workshop. All test statistics were one-tailed at p-value < 0.05.

### *Results*

#### *Personal demographic data*

A total of 76 participants, majority were female (68.4%), age group 40-50 years old (51.3%), married (89.5%), finished primary school (76.3%), employed in agriculture (61.8%), and had income more than 10,000 bath/month (40.8%). (Table 1)

**Table 1:** Personal demographic characteristic of participants

Characteristic (n=76)	Number	Percentage
<i>Gender</i>		
Male	24	31.6
Female	52	68.4
<i>Age (years old)</i>		
40 - 50	39	51.3
51 - 60	29	38.2
61 - 70	8	10.5
<i>Marital status</i>		
Single	1	1.3
Married	68	89.5
Widowed	4	5.3
Divorced or Separated	3	3.9
<i>Education</i>		
No school	2	2.6
Primary school	58	76.4
Secondary school	13	17.1
Diploma	2	2.6
Bachelor degree	1	1.3
<i>Occupation</i>		
No employment	3	3.9
Agriculture	47	61.9
Government service	2	2.6
Commercial work	10	13.2
General labor	14	18.4
<i>Income (Baht/month)</i>		

Characteristic (n=76)	Number	Percentage
< 3,000	22	29.0
3,001 – 5,000	8	10.5
5,001 – 10,000	15	19.7
> 10,000	31	40.8

*Level of health perception regarding CCA among participants before and after attending workshop*

Participants had higher level of all parts of health perception regarding CCA after attending workshop compared with before attending. Perceived susceptibility, perceived severity and perceived barriers were the parts that showed higher scores with statistical significance at 0.05 level. (Table 2)

**Table 2:** Comparison of health perception regarding CCA among 76 participants before and after attending health education workshop

Level of health perception regarding CCA	Health education workshop				t	sig (1-tailed)
	Before		After			
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		
Perceived susceptibility	3.58	0.74	3.80	0.46	-2.11	0.019*
Perceived severity	3.85	0.71	4.11	0.55	-2.35	0.011*
Perceived benefits	3.90	0.65	3.93	0.33	-0.34	0.369
Perceived barriers	2.34	1.04	2.63	0.98	-1.69	0.048*

*Level of CCA preventive behaviors among participants before and after attending workshop*

Participants had lower level of overall CCA preventive behaviors after attending workshop compared with before attending with no statistical significance. However, the behavior “You always eat cooked freshwater fish”, “You always eat cooked food” and “You have received hepatitis B vaccination” level were lower after attending workshop with statistical significance at 0.05 level. Whereas, the behavior “You do not eat moldy food” level was higher after attending workshop with statistical significance at 0.05 level. (Table 3)

**Table 3:** Comparison of CCA preventive behaviors among 76 participants before and after attending health education workshop

Level of CCA preventive behaviors	Health education workshop				t	sig (1-tailed)
	Before		After			
	$\bar{x}$	S.D.	$\bar{x}$	S.D.		
You always eat cooked freshwater fish.	4.22	0.87	3.86	0.93	2.54	0.001*
You always eat cooked food.	4.17	0.89	3.92	0.81	1.68	0.049*
You do not eat moldy food.	3.49	1.67	3.99	0.79	-2.30	0.012*
You do not drink alcohol.	3.54	1.54	3.70	0.97	-0.71	0.240
You do not eat raw fermented fish, raw pickled small fish.	3.32	1.32	3.51	0.99	-1.06	0.146
You do not eat raw sore pork, raw sausage.	3.53	1.47	3.42	0.91	0.52	0.302
You have received hepatitis B vaccination.	3.36	1.59	2.36	1.43	4.29	< 0.001*
You always eat vegetables and fruits.	4.14	1.04	4.01	0.70	0.96	0.170
You do not eat food cooked with raw fermented fish.	3.39	1.37	3.37	0.91	0.15	0.443
<b>Overall CCA preventive behaviors.</b>	<b>3.68</b>	<b>0.85</b>	<b>3.57</b>	<b>0.71</b>	0.92	0.181

### Discussion

From the health education workshop results, we found that participants had higher level of all parts of health perception regarding CCA particularly perceived susceptibility, perceived severity, perceived barriers that were statistically significant. This finding was similar to the studies by Phatisena et al.<sup>12</sup> and Thongnamuang.<sup>13</sup> Both studies applied HBM through health education program and their findings showed higher level of perceived susceptibility, perceived severity, perceived benefits and perceived barriers after joining the program. Therefore, health education campaign should be promoted among people in order to prevent CCA.<sup>14,15</sup> However, perceived barriers seemed to be greater after workshop. It might indicate that participants were still not confident to modify their own behaviors because of various obstacles in their communities such as; participants could not refuse eating raw food when they participated in merit rituals or other traditional events. Sometimes, they had to eat raw food because they respected and should be courteous to host or other people to maintain friendship. In addition, unavailable healthcare services might be the perceived barrier that caused lower level of hepatitis B vaccination behavior.

Most of CCA preventive behaviors were lower after attending workshop, except the behavior “You do not drink alcohol”, “You do not eat raw fermented fish, raw pickled small fish”, especially, the behavior “You do not eat moldy food” that showed higher with statistical significance. These unimproved behaviors might be due to the participants had higher perceived barriers that mentioned above. Nevertheless, the findings presented that the participants decrease eating moldy food after workshop. It might be due to such behavior can be modified more easily than others. Participants

were able to refuse eating moldy food when they went to the party with their friends but could not refuse eating raw food due to maintain friendship. The findings were not consistent with many studies that demonstrated better behaviors after attending health education program.<sup>12,13,15</sup> The result of non-improved behaviors required further investigation to elucidate our findings.

### ***Conclusion***

Participants showed higher level of 3 parts of health perception regarding CCA after workshop, including perceived susceptibility, perceived severity and perceived barriers but demonstrated lower level of many CCA preventive behaviors. However, the behaviors should be measured periodically in order to follow the change. The recommendation for CCA preventive behavior improvement is that health education should be focused on elimination of obstacles or barriers in the community which obstructed the behavior modification. It also should be implemented more than one time to the same participants in order to maintain good practices.

### ***Competing interest***

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

#### **Practice Points**

- People in Si Samran subdistrict still ate raw fish or other menu cooked with raw fish. CCA prevention campaign or workshop should be done to enhance awareness and perception to reduce raw fish consuming behaviors.
- Participants had higher level of 3 parts of health perception regarding CCA after health education workshop, including perceived susceptibility, perceived severity and perceived barriers but demonstrated lower level of many CCA preventive behaviors.
- Health education should be focused on elimination of barriers in the community which obstructed the behavior modification.

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