

The Comparative of Liver Fluke Prevention's Media Between Hand Book and VCD in Primary School

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Abstract: This quasi-experimental research was aimed for studying the effectiveness of a handbook and a VCD for liver fluke prevention among primary school students in 4 schools in Phu Wieng district, Khon Kaen province, Thailand. The samples were 152 subjects divided into two groups; the 1st experimental group included 82 subjects who received health education about liver fluke prevention using a handbook and the 2nd experimental group were 70 subjects who received health education about liver fluke prevention using a VCD. The data were collected by questionnaire and analyzed by the STATA program. The statistics for the descriptive data included percentage, distribution, arithmetic mean and standard deviation and comparisons between groups and within groups were made using paired sample t-test and independent sample t-test. The results showed that after implementation, both experimental groups had significantly higher mean score in three factors namely knowledge, attitude and perceived susceptibility ($p < 0.001$) while perceived benefit and perceived barrier in 1st experimental group had significantly higher mean score than before ($p < 0.001$) as well as perceived severity in 2nd group had significantly higher mean score than before ($p < 0.001$) including liver fluke prevention practice had significantly higher mean score than before ($p < 0.05$ and $p < 0.005$) in consequently 1st group and 2nd group. In addition, the difference in mean score between the 1st and 2nd experimental groups was not significant except perceived susceptibility and perceived benefit ($p < 0.001$) but both were at a high score level. Both groups of students agreed that both media handbook and VCD were useful. They needed to read and clearly understand for the handbook and needed a teacher for the VCD. The examination for parasites found that there were 18 infections including 14 for liver flukes (11.48%) and a few other parasites. This research suggests that both media were effective at behavior modification for liver fluke prevention. Therefore, they should be published and further used for liver fluke prevention.

Key words: Effectiveness, liver fluke, hand book, VCD, primary school students, Thailand

INTRODUCTION

Opisthorchis viverrini, common name Southeast Asian liver fluke is a trematode parasite that attacks the area of the bile duct. *Opisthorchis viverrini* infection predisposes for cholangiocarcinoma, a cancer of the gall bladder and/or its ducts. *Opisthorchis viverrini* is found mainly endemic in Southeast Asian countries Northeast Thailand, Laos, Vietnam and Cambodia. Currently, >600 million people are at risk of infection with these trematodes (Touch *et al.*, 2009). Infection with these food-borne parasites is prevalent in areas where uncooked cyprinoid fish are a staple of the diet. Due to poor sanitation practices and inadequate sewerage infrastructure, people infected with *O. viverrini* and *C. sinensis* pass parasite eggs in their faeces into natural water reservoirs where the parasite eggs are eaten by

intermediate host snails, for example aquatic snails of the genus *Bithynia*, the 1st intermediate host of *O. viverrini*. After hatching, free swimming parasites called cercariae are released from the infected snails. Cercariae then locate their next intermediate host, cyprinoid fishes, encyst in the fins, skin and muscles of the fish and become metacercariae. The metacercariae are infective to humans and other fish-eating mammals. *Opisthorchis viverrini* is the only liver fluke that has been proved to be associated with Cholangiocarcinoma (CCA) and cancer of the bile ducts (Touch *et al.*, 2009; Chutiwittonchai *et al.*, 2008). Cholangiocarcinoma is a cancer of the tissue of the bile duct both inside and outside the liver. Cholangiocarcinoma outside of the liver is possible along the length of the intestine. Most (>60%) are found at the bile duct outside the liver. Patients of Cholangiocarcinoma are mostly of age 45-65. The ratio of male to female is 3:1.

The symptoms of the patients who visit the doctor are in 2 main groups. Firstly, the group with yellowish body and eyes amount to 70%. The patients are yellowish and may have a high temperature with big liver and stomach. The 2nd group without a yellowish body and eyes but a record of constipation of a month or year long. Liver fluke and Cholangiocarcinoma Research Center. The main strategies for liver fluke control comprise of three interrelated approaches; namely stool examinations and treatment of positive cases with praziquantel; health education for a promotion of cooked fish consumption to prevent infection and the improvement of hygienic defecation for the interruption of disease transmission. Between 1984 and 1987, the positive rate of liver fluke infection was 63.6%. In 1988, the positive rate went down to 35.6%. Following the region wide control program started in 1989, the annual positive rates had subsequently decreased to 9.4% in the year 2001. The prevalence rate was remarkably high in the North and moderately high in the Northeast while the prevalence in the Central region was considerably low and there was no evidence of disease transmission in the South (Jongsuksuntigul and Imsomboon, 2003).

Survey research from 1,077 persons who were interviewed and completed the questionnaires. The majority were local public health volunteers (31.37%), public health officers (18.72%), televisions (14.38%), local heads of sub-districts (12.31%), doctors and nurses (9.18%), newspaper (5.72), internet (5.37%) and others (12.95%). Found that 55.11% of the population had a good level of liver fluke knowledge concerning the mode of disease transmission and 79.72% of the population had a good level of prevention and control knowledge with regards to defecation and consumption. The attitude and practice in liver fluke prevention and control were also at a good level with a positive awareness, participation and satisfaction of 72.1 and 60.83% of the persons studied. However, improvement is required regarding personal hygiene specifically with hygienic defecation and consumption of undercooked fish. Protection is the best method, requires a low budget and is most worthwhile considering the effects which cause great suffering, financial loss and loss of people, leading to a run down of society and the country.

Education about food, knowledge and understanding in prevention are the methods to restore energy to the development of the nation. At the primary school age in particular, proper behavior may lead to strong and healthy adults which help the development of the country. Study of media is the best method to stimulate interest. From the past to the present, handbooks are considered to be good teaching media and are still very popular because they are

easy to use, convenient and can be used on every occasion. There may be limitations of electricity but books only need literacy. Another alternative is the VCD which is popular for education, easy to use can include both pictures and colors as well as sound to make them easy to understand. Media for teaching must be constructed and developed to meet the needs of the target group, particularly for liver fluke which is the most serious disease in the Northeast. Media must impress, provide knowledge and understanding, change personal concepts and correct knowledge and modify health behavior for the prevention of liver fluke especially at school age. Protection is the best method, requires a low budget and is most worthwhile considering the effects which cause great suffering, financial loss and loss of people, leading to a run down of society and the country.

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Research objectives:

- To comparative knowledge on liver fluke between students who use VCD and handbook on liver fluke prevention

- To comparative attitude toward liver fluke between students who use VCD and handbook on liver fluke prevention
- To comparative perception on liver fluke between students who use VCD and handbook on liver fluke prevention
- To comparative practice on liver fluke prevention between students who use VCD and handbook on liver fluke prevention
- To conduct educational aids on liver fluke prevention both in VCD and handbook for primary school students

MATERIALS AND METHODS

Quasi experimental research

Population: Primary school students in Phu Wieng district, Khon Kaen, Thailand.

Sample group: Primary schoolchildren in four schools, Koke Sahakorn School, Non-Sombool Prachasarn school, Ban Han school and Huay-San school. The sample had 152 subjects and was divided into two groups. The 1st group was Ban Han school and Non-Sombool Prachasarn school with 82 subjects which received the health education by using handbook for liver fluke prevention and the 2nd group was Huay-San school and Koke Sahakorn school with 70 subjects which received the health education by using VCD.

Research design: Quasi experimental research with two groups. The 1st group received the liver fluke prevention handbook and the 2nd group received the liver fluke prevention VCD. Data collection by using a questionnaire for pre- and post-test.

Research tools: Tools for data collection was quantitative questionnaire which developed by researcher based on documents and related research with 6 parts to the questionnaire as following:

Part 1: Personal data include sex, age, classroom level, school, parents' occupation, house lavatory and own shoes.

Part 2: Liver fluke knowledge include correct answer got 1 point and incorrect answer got 0 points.

Part 3: Attitude questionnaire about liver fluke prevention using Likert's rating scale by adjusting score into 3 levels.

Part 4: Questionnaire about perceived severity, perceived susceptibility, perceived benefits and perceived obstacles from liver fluke amounting to 15 questions.

Part 5: Behavioral practice about liver fluke prevention. Consists of choice questions and choosing the right answer. Correct answer got 1 point and incorrect answer got 0 points.

Part 6: Educational aid needed 5 questions to choose Yes or No. Consists of choice answer and choose the right one for 5 questions.

Reliability of the instrument: The test of reliability of the instrument by trying out with a sample group similar is student in Nong Pakwan primary school with 30 students and final the trust worthiness by the alpha coefficient by combach in the level of significance of the whole questionnaire was >0.75 were accepted. The test of discriminate value of knowledge by using Kuder-Richardson (KR 20) method to complete knowledge questionnaire reliability value 0.2-0.8 were accepted.

Experimentation tools: Liver fluke prevention handbook and liver fluke prevention VCD which were conducted by researcher.

Data collection:

- Getting official permission from the officer of Phu Wieng district health station, Khon kaen
- Explaining the objectives of the research and procedure to five primary schools in the high prevalence area of liver fluke by simple random sampling, one school for trying out the questionnaire, two schools of health education by using hand book on liver fluke prevention and another two schools for health education by using VCD on liver fluke prevention
- Data collecting by questionnaire for pre-test before intervention and post-test after intervention for comparison mean score and significant different test
- First group intervention by distribute hand book which were concluded by researcher during health education by in 2 schools (Huay-San school and Koke Sahakorn school; 82 students)
- Second 1st group intervention by conduction health education by using VCD in 2 schools 70 students in Ban Han school and Non-Somboon Prachasan school

Data analysis: After the researcher gathered the information, researcher will inspect the completeness and

correctness of the received questionnaires and data analysis by using STATA program for frequency distribution mean, standard deviation and paired t-test between pre test and post test including using independent t-test compare between group 1 and 2.

RESULTS

General data analysis: The sample group included 152 students and divided in two groups. The 1st group used the handbook and the 2nd group with 70 people used the VCD. It was found that the majority of samples were male. About 43 males used the handbook (52.44%) and 38 males (54.29%) used the VCD. Most of all were age 11 or 10 years old while 34 students 11 years old (41.46%) used the handbook and 22 students 11 years old (31.43%) used the VCD. The sample group had 40 students in grade 5 (48.78%) and 22 students in grade 4 (31.43%). The handbook using group was Ban Han school with 37 people (45.12%) and Non-Sombool Prachasarn school with 45 people (54.88%). The VCD using group was Koke Sahakorn school with 21 people (30%) and Huay-San school with 49 people (70%).

The handbook using group's parents majority were employees (41 people or 50%) or farmers (30 people or 36.55%). While the VCD using group's parents most likely were farmers (27 people or 38.57%) or employees (26 people or 37.14%). Most students who used the handbook had a lavatory at home (79 people or 96.34%) and other group who used the VCD had a lavatory at home (68 people or 97.14%). Most students who used the handbook had shoes (78 students or 95.12%) and VCD using group had shoes (68 people or 97.14%).

The comparison score of knowledge about liver fluke prevention between pre- and post-test for the sample group: The liver fluke prevention knowledge score between pre- and post-test for the sample group who used the handbook increased from pre-test score of 5.89 (SD: 1.85) to post-test score of 6.80 (SD: 1.44). The change in score between post- and pre-test had statistical significance ($p < 0.001$; 95% CI: 0.50-1.32). The VCD using group had average score which increased from 6.09 (SD: 1.72) for pre-test to 7.93 for post-test (SD: 1.92). There was statistical significance for the increase ($p < 0.001$; 95% CI: 1.25-2.44).

The average liver fluke prevention knowledge pre-test scores for the VCD using and handbook using group were at 6.09 (SD: 1.72) and 5.89 (SD: 1.85), respectively. The average score in the VCD using group was higher than the handbook using group by 0.195. There was no statistical difference ($p = 0.75$; 95% CI: 0.77-0.38).

Post-test, the VCD using group had an average score of 7.93 (SD: 1.92) while the handbook using group had an average score of 6.80 (SD: 1.44), higher by 1.12. However, there was no statistical difference ($p = 1.00$; 95% CI: -1.66 to -0.58).

The comparison score of attitude toward liver fluke prevention between pre- and post-test in the sample group: Concerning liver fluke prevention attitude, the handbook using group had an average pre-test score of 31.85 (SD: 3.34) while post-test, they gained higher scores than pre-test at 33.22 (SD: 1.69). Comparing the score between pre- and post-test, there was a statistically significant difference ($p < 0.001$; 95% CI: 0.71-2.03).

The VCD using group gained average pre-test score of 31.77 (SD: 3.38) while their average post-test score was higher than the pre-test at 33.44 (SD: 1.72). The difference was statistically significant ($p < 0.001$; 95% CI: 0.86-2.48). Comparing the liver fluke prevention attitude between the handbook and the VCD using groups, the pre-test average scores were 31.85 (SD: 3.34) and 31.77 (SD: 3.38) for handbook and VCD using groups, respectively. The difference of 0.08 was not statistically significant ($p = 0.44$; 95% CI: -0.99 to 1.16).

Post-test, the average scores were 33.44 (SD: 1.72) and 33.22 (SD: 1.69) for the VCD and handbook using groups respectively, a difference of 0.22, which was not statistically significant ($p = 0.79$; 95% CI: -0.77 to 0.32).

The comparison of perceived severity score about liver fluke prevention between pre- and post-test in the sample group: In the handbook using group, the average perceived severity score was 9.76 (SD: 1.35) for the pre-test while the post-test average score was higher at 9.97 (SD: 0.99). There was no statistically significant difference ($p = 0.13$; 95% CI: -0.15 to 0.57).

In the VCD using group, the average pre-test score was 10.00 (SD: 1.25) while the post-test average score was higher at 12.47 (SD: 1.64). There was no statistically significant difference ($p < 0.001$; 95% CI: 2.07-2.84). A comparison of perceived severity to liver fluke prevention in the handbook using and VCD using groups was made. Pre-test, the handbook using group had an average score of 9.77 (SD: 1.35) while the VCD using group had an average score of 10.00 (SD: 1.25) which was higher by 0.23. There was no statistical significance ($p = 0.86$; 95% CI: -0.65 to 0.19).

Post-test, the handbook using group had an average score of 9.98 (SD: 0.99) while the VCD using group had an average score of 12.47 (SD: 1.64) which was higher by 2.50. There was no statistically significant difference ($p = 1.00$; 95% CI: -2.92 to -2.07).

The comparison of perceived susceptibility score of liver fluke between pre- and post-test in the sample group:

The average perceived susceptibility score for liver fluke in the handbook using group was 9.57 (SD: 2.11) for the pre-test score. Post-test, the score increased to be 10.29 (SD: 1.22). There was a statistically significant difference between pre- and post-test ($p < 0.001$; 95% CI: 0.30-1.14). In the VCD using group, the pre-test score was 10.00 (SD: 1.80). Post-test, the score decreased to be 7.54 (SD: 1.34). However, there was no statistically significant difference ($p < 0.001$; 95% CI: -2.93 to -1.99). Perceived susceptibility liver fluke was evaluated in pre- and post-test in the handbook using and VCD using groups. Pre-test, the handbook using group had an average score of 9.57 (SD: 2.11) while the VCD using group had an average score of 10.00 (SD: 1.80) which was higher by 0.43. However, there was no statistically significant difference ($p = 0.91$; 95% CI: -1.06 to 0.21).

Post-test, the handbook using group had an average score of 10.29 (SD: 1.22), while the VCD using group had an average score of 7.54 (SD: 1.34) which was higher than the handbook using group by 2.75. The difference was statistically significant ($p < 0.001$; 95% CI: 2.34-3.16).

The comparison of perceived benefit score about liver fluke prevention practice between pre- and post-test in the sample group:

Perceived benefit average score about liver fluke prevention practice in the handbook using group gave a pre-test score of 7.94 (SD: 1.39) while post-test, the score had increased to be 8.73 (SD: 0.47). There was statistical significance ($p < 0.001$; 95% CI: 0.49-1.09). In the VCD using group, the average pre-test score was 7.67 (SD: 1.47) while post-test, the score had decreased to be 8.21 (SD: 1.09). A comparison found statistical significance ($p < 0.005$; 95% CI: 0.11-0.97).

Pre-test, the VCD using group had a higher average score at 7.94 (SD: 1.40) concerning perception about liver fluke prevention practice while the handbook using group had 7.67 (SD: 1.47), a difference of 0.43. There was no statistically significant difference ($p = 0.13$; 95% CI: -0.19 to 0.73).

Post-test, the handbook using group had an average score of 8.73 (SD: 0.47) while the VCD using group had an average score of 8.21 (SD: 1.47) which was higher than the handbook using group by 0.52. There was a statistically significant difference between pre- and post-test ($p < 0.001$; 95% CI: 0.26-0.78).

The comparison of perceived problem and barrier to liver fluke prevention between pre- and post-test in sample group: The perceived problem and barrier to liver fluke prevention average pre-test score was 9.27 (SD: 2.01)

while post-test the score had increased to be 10.04 (SD: 1.31). Comparing the score between pre- and post-test, statistical significance was found ($p < 0.001$; 95% CI: 0.36-1.17). In the VCD using group, the pre-test score was 8.97 (SD: 1.99). Post-test, the score had increased to be 9.80 (SD: 1.66). Comparing score between pre- and post-test found statistical significance ($p < 0.005$; 95% CI: 0.34-1.32). The perceived problem and barrier to liver fluke prevention between pre- and post-test in the handbook using group gave a pre-test score of 9.27 (SD: 2.01) while the VCD using group gained an average pre-test score of 8.97 (SD: 1.99) which was lower than the handbook using group by 0.43. After comparing the score, no statistically significant difference was found ($p = 0.18$; 95% CI: -0.35 to 0.94).

Post-test, the handbook using group gained an average score of 10.04 (SD: 1.31) while the VCD using group gained an average score of 9.80 (SD: 1.66) which was lower than the handbook using group by 0.24. Comparison showed no statistically significant difference ($p = 0.16$; 95% CI: -0.24 to 0.71).

The comparison of behavioral practice score in liver fluke prevention between pre- and post-test in sample group:

The behavioral practice in liver fluke prevention in the handbook using group had an average pre-test score at 23.13 (SD: 3.99) while post-test the score had increased to be 23.88 (SD: 2.63). After comparing the scores, no statistically significant difference was found ($p = 0.053$; 95% CI: -0.17 to 1.65).

In the VCD using group, the pre-test score was 22.67 (SD: 3.79). Post-test, the score had increased to be 26.29 (SD: 2.51). There was a statistically significant difference in the scores ($p < 0.005$; 95% CI: 2.58-4.65). The behavioral practice in liver fluke prevention in the handbook using group had a pre-test score of 23.13 (SD: 3.99) while in the VCD using group the average score was 22.67 (SD: 3.79) which was less than the handbook using group by 0.46. After comparing scores, no statistically significant difference was found ($p = 0.23$; 95% CI: -0.79 to 1.72).

Pre-test, the handbook using group had an average score of 23.88 (SD: 2.63) while the VCD using group had an average score of 26.29 (SD: 2.15) which was higher than the handbook using group by 0.41. After comparing the scores, no statistically significant difference was found ($p = 1.00$; 95% CI: -3.19 to -1.63).

The comparison of requirements about liver fluke prevention educational aids between pre- and post-test in the sample group:

Considering experience about receiving liver fluke prevention information, it was found that the students gained most knowledge from health personnel

teaching in schools. The handbook using group had 42 such subjects (51.22%) and the VCD using group had 40 subjects (57.14%). The handbook using group agreed that they gained more knowledge from reading handbooks with 26 subjects (31.71%) while the VCD using group agreed that they gained more knowledge from teachers at 31 subjects (44.29%). The students from the 2 sample groups were satisfied with educational aids (56 subjects or 80%). In the handbook using group 20 subjects (60.98%) and in the VCD using group 49 subjects (70%) agreed that the greatest benefit from educational aids was gained knowledge. In the handbook using group 39 subjects (47.56%) and in the VCD using group 34 subjects (48.57%) agreed that they gained knowledge about practice on liver fluke prevention.

Results of parasite diagnosis: Result of parasite diagnosis found that 18 students (11.84%) had parasites. The types of parasite mostly found were liver flukes, strongiloids and hookworms in that order.

DISCUSSION

After implementation found that knowledge, attitude, perception higher mean score significantly different than before both group 1 and 2 was probably due to handbook and VCD provide knowledge on cause, symptom, how to prevent liver fluke including the picture of liver fluke prevention made increasing knowledge, attitude, perception and practice as well as student had on opportunity to ask question and express opinion about liver fluke prevention. In addition, the difference in mean score between the group 1 and 2 after implementation was not significantly except perceived susceptibility which group 1 who using hand book because students need to read clearly for understanding and took more time. While the group 2 who use VCD made them enjoy and arousing including stimulus them fear form parasite pictures and lead to good attitude and behavior. However, the students of both groups agree that both of medias were useful. The students had changed behavior for liver like prevention significantly mean score than before in both groups. While group 2 was significant at $p < 0.005$ and group 1 was significant at $p < 0.05$ but no significant between group 1 and 2.

Therefore, it can be founded that health education by VCD made more attractive because it has a colorful movement and made excitement as well. This research relevant other study which found that VCD for demonstration of nasogastric intubation made medical students were able to self-improve their procedural skills of nasogastric intubation after viewing the VCD.

Application of this method to other basic procedures may be useful (Sookpotarom *et al.*, 2007). On the other hand, handbook is effective media provide information to enhancing the teaching and learning experience of students. It would contribute to providing a skill (Nabwera *et al.*, 2008) and relevant with the study of cystic fibrosis handbook for teachers study found that after study handbook increase teachers' knowledge of cystic fibrosis and support communication among nurses, parents and teachers (Ryan and Williams, 1996). Therefore, both of media would be distribute for liver fluke prevention further. In addition, stool examination found that students (11.84%) had parasites. The types of parasite mostly found were liver flukes, strongiloids and hookworms. Relevant study by Warunee *et al.* (2007).

About 12.6% of students were infected with one or more of 10 intestinal parasite species. In these infected subjects, 214 (11.1%) were single infections where as 28 (1.5%) were mix infections. The most frequent parasite was *Blastocystis hominis* (6.2%). Other parasites were *Giardia lamblia* (1.7%), *Entamoeba coli* (1.5%), *Endolimax nana* (1.0%), *Entamoeba histolytica* (0.3%), Hookworm (0.3%), *Trichuris trichiura* (<0.1%), *Taenia sp.* (<0.1%), *Strongyloides stercoralis* (<0.1%) and liver fluke or small intestinal fluke (*Opisthorchis* eggs) (<0.1%). (Warunee *et al.*, 2007).

CONCLUSION

The comparison of the effectiveness of health education aids for liver fluke prevention behavior between handbook and VCD in primary school students was quasi-experimental research. The research was a comparative study of educational aids by VCD and handbook in 4 primary schools in Phu Wieng district, Khon Kaen amounting to 152 students, divided into two groups. The 1st group was Ban Han school and Non-sombool Prachasarn school which received health education by handbook about liver fluke prevention and the 2nd group was Huay-san school and Koke Sahakorn school with 70 subjects which received a health education VCD. Data collection was by questionnaire between pre- and post-test. The results showed that after implementation both experimental groups had significant higher mean score than before. On the other hand, no difference between group 1 and 2 but both of groups were the same high score level.

RECOMMENDATIONS

The health education by using hand book for liver prevention should distribute to students and took to their home for considering whenever, they have available time

and should available these in library also. The health education by using VCD need more available VCD player and need teachers' helping. The examination for parasites found that there were 18 infections including 14 for liver fluke (11.48) and a few other parasites. It s very important and necessary to continue increasing knowledge, attitude and perception for all students lead to change their prevention behavior parallel of medicine curative as well as good hygiene:

- There should be a research study with interventions about liver fluke prevention in schools
- There should be development in schools about how to diagnose liver flukes by students
- A variety of stimulating educational aids should be developed
- There should increase concern among student and communities and stake holders on liver fluke prevention
- There should be promotion and cooperation about liver fluke prevention by changing habits of eating and daily life

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