

# The Effects of Health Literacy Enhancing Program on STI/HIV Prevention in Vocational Students, A Quasi-Experimental Study

Suwattana Onprasonk MPH<sup>1</sup>, Kanokporn Pinitluek MPH<sup>1</sup>, Kingkan Jongjaihan Dip. NS<sup>1</sup>, Widsanugorn Onprasonk MD<sup>2</sup>

<sup>1</sup> The Office of Disease Prevention and Control 7<sup>th</sup>, Khon Kaen, Thailand

<sup>2</sup> The Huaimek Hospital, Kalasin, Thailand

**Objective:** To investigate the effects of health literacy enhancing program on STI/HIV prevention (HLP) of vocational students.

**Materials and Methods:** The present study was a quasi-experimental study conducted by using one-group pretest-posttest design. A total of 51 vocational students were selected from the 7<sup>th</sup> health region. The research instruments of the health literacy enhancing program on STI/HIV prevention were used for the data collection. The program was developed based on health literacy of Nutbeam which consisted of 6 components including: knowledge and understanding, access to information and health services, communicating skills, self-management, media literacy, decision-making skills. The data were analyzed with descriptive statistics and inferential statistics, including paired t-test which identified the mean difference between before and after the program implementation had been reported.

**Results:** The present study observed the mean score of the participant was higher after the participation in the program. The mean difference between before and after participation was 26.5 with 95% confidence interval 23.6 to 29.3 scores,  $p < 0.001$ .

**Conclusion:** The present study suggests that the HLP could improve health literacy. Therefore, this program should be provided to students or teenagers in the educational institutions.

**Keywords:** STI/HIV prevention; Health literacy; Vocational students

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The situation of sexually transmitted diseases (STDs) shows an increasing trend in Thailand, from 20.1 per 100,000 people in 2015 to 33.5 per 100,000 population in 2021, especially the 15 to 24 years age-group<sup>(1)</sup>. The increase in STDs is an indicator of unsafe sex, unwanted pregnancy, and HIV<sup>(2)</sup>. In particular, vocational students are at high risk of sexual problems, as the learning process is professional and focused on practices rather than teaching all day. Those students have more free time than the ordinary students. Because of having more leisure times after their practical classes, they are very prone to get involved

in some unusual activities which are connected with premature sexual activities as entertainment. These days, they can follow the internet to view clips of such activities<sup>(3)</sup>. The risk of sexual behavior among adolescents outlined several influencing factors on sexual behaviors and these include attitude, beliefs, and social influences. Under such circumstances, adolescents often seek access to information via the mass media and friends. The disadvantage is that the information they get may be inaccurate, and with misconceptions. Sexually suggestive messages from mass media and the consulting friends, can lead to early sexual experimentation<sup>(4-7)</sup>. Adolescents, particularly those under 16 years of age, constitute a high-risk group who are less likely to use or have access to condoms or contraceptives<sup>(8-11)</sup>. In the 7<sup>th</sup> World Health Promotion Conference, the World Health Organization (WHO) emphasized the importance of developing health literacy in this population, and defined as the intellectual and social skills needed to develop healthy lifestyles and behaviors. Motivation and competency to access services, and understanding information provided by the health services could promote and maintain one's

## Correspondence to:

Onprasonk S.

The Office of Disease Prevention and Control 7<sup>th</sup>, Khon Kaen 40000, Thailand.

Phone: +66-89-4205131

Email: [tooktagam@yahoo.com](mailto:tooktagam@yahoo.com)

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health<sup>(12)</sup>. People with low levels in health literacy are more likely to have risky behaviors, poor self-care, health problems which lead to increasing health-care costs<sup>(13-15)</sup>. From the report on the results of the survey of health literacy in Prevention of STDs of Vocational Education Students in Health District 7<sup>th</sup> found most of students had low health literacy in preventing STDs i.e., 79.5% of male students and 62.5% of female students respectively<sup>(16)</sup>. Health literacy of sexual is the ability to perceive own emotions, be aware of the importance of self-management sexually leads to strong immunity<sup>(17)</sup>.

From the literature review, found that the Office of the Vocational Education Commission (VEC) has recognized the importance of learning management of sexuality education which is of very importance for better life. The VEC has introduced sexuality education course in the curriculum of vocational schools in 2004<sup>(18)</sup>. Despite providing many practical and variety of ways to teach the students regarding sexual education at schools, teachers are still following the traditional teaching methods which are based on descriptive methods. The teaching process does not look so effective that students can develop critical thinking, good communication skills and negotiation which can be applied in their real life for safe sexual behaviors. Many educational institutions are also emphasizing on sex bans<sup>(19,20)</sup>.

Thus, the researchers are interested in the program to promote health literacy on STI/HIV prevention among vocational students. Using the concept of Nutbeam's health literacy theory<sup>(21)</sup>, applied the guidelines for the development of health literacy schools, Department of Health<sup>(22)</sup> to organize communicating activities on sexually transmitted diseases and AIDS<sup>(23)</sup>, and the UNESCO International Academic Guidelines for Sexuality Education<sup>(24)</sup> are used in learning management. To strengthen vocational students to have safe sex, delay first intercourse and have more responsibility. Therefore, the present study aimed to investigate the result of health literacy enhancing program on STI/HIV prevention (HLP) among vocational students.

## Materials and Methods

The HLP was developed based on the health literacy 6 elements of Nutbeam<sup>(21)</sup> comprised of knowledge and understanding, access to information and health services, communicating skills, self-management, media literacy, decision-making skills.

## Study design

A pretest-posttest, quasi-experimental design was conducted to examine effects of the program immediately post-interventional, and at 4 days on level of health literacy.

## Participant and study sites

In accordance to the purposive sampling and design of the present study, one vocational school in Health Region 7<sup>th</sup>. Kalasin Technical College, Kalasin Province, Thailand was designated as the study site. The required sample size was calculated according to the formula of quasi-experimental research pretest-posttest: one group<sup>(25)</sup> as follows:

$$n = \frac{(Z_{\alpha} + Z_{\beta})^2 \sigma^2}{(\mu_1 - \mu_2)^2}$$

n=number of samples

( $\mu_1 - \mu_2$ )=the mean difference between before and after interventional, based on the study of Muanphetch et al<sup>(26)</sup>

$\alpha$ =type I error at significant level=0.05, therefore  $Z_{\alpha}$ =1.96

$\beta$ =type II error at power of test=90%, therefore  $Z_{\beta}$ =1.28

$\sigma^2$ =the variance based on the study of Muanphetch et al<sup>(25)</sup>

$$n = \frac{(1.96 + 1.28)^2 12.46^2}{(157.70 - 137.00)^2} = 3.80$$

The sample size calculation for the study was 4 students, however the present study was 1 to 2 room study with a total of 30 students or more. The next step, was to random sampling of 1 classroom. The present study included all students as sample from the classroom. If the number of the students was less than 30, it required to get one more class to get the samples. A total of Fifty-one students were enrolled.

The ethical approval was obtained from the Department of Disease Control of Thailand Board (FWA 00013622). Before commencement of the intervention, written informed consents were obtained from all the participants, and a formal administrative approval sought from the school director.

## Interventional program

The developed interventional program aimed to enhance health literacy on STI/HIV prevention of vocational students. The interventional program consisted of 4 plans, and 7 activities. Key message on HLP consisted of enhancing plan on access to information and health services, knowledge and understanding, communicating skills, self-management, media literacy, and decision-making

skills. The program was carried out once a week, total 4 times, for 2 to 3 hours per day as follows:

The first time, learners were introduced to the program, and they set group norms, had a pretest, and learned about “the access to information and health services, knowledge and understanding on puberty, sex, reproductive health, and the prevention of STI/HIV infection”.

The second time, focused to enhance decision-making skills, and self-management on the prevention of STI/HIV infection. Activities included game to learn about the contraceptive methods, condom demonstration and practice, and accepted/rejected games.

The third time, focused on enhancing communication skills on the prevention of STI/HIV infection. Activities included role-playing exercises to practice talking about sex, refuse to have sexual intercourse, and practicing assertiveness skills.

The fourth time, focused to enhance media literacy on the prevention of STI/HIV infection. Activities included a storyboard discussion on social media, small group discussions about prevention of STI/HIV infection, and took a posttest.

### Measurement

1. The interventional program was checked and recommended from 3 experts to improve activities, objectives, use of equipment and teaching in each lesson plan, item-objective congruence (IOC) index value was 0.86.

2. Health literacy score was measured using questionnaires developed by Onprasong et al<sup>(16)</sup>. It consisted of two parts: the first part was general information [e.g., gender, marital status of parents, current residential type], and the second part consisted of health literacy. The health literacy section comprised 6 components, which were: 1) knowledge and understanding, 2) access to information, 3) communicating skills, 4) self-management, 5) media literacy, and 6) decision-making skills. The reliability of the tools was tested by analyzing the classification power between 0.24 to 0.82, the difficulty between 0.41 to 0.85, the KR-20 between 0.44 to 0.60 and the reliability (Cronbach’s alpha) was between 0.55 to 0.86<sup>(27)</sup>. Participants who answered 80% or more of questions correctly were categorized as having ‘good’ health literacy<sup>(28)</sup>.

### Data analysis

Descriptive statistical analysis assessed health literacy levels using percentage, mean ± standard

**Table 1.** The number and percentage of the informants classified by general information

General information	Frequency (n=51); n (%)
Sex	
Male	3 (5.9)
Female	46 (90.2)
LGTB	2 (3.9)
Marital status of parents	
Living together	27 (52.9)
Widow/divorce/separate	19 (37.3)
Father/mother death	5 (9.8)
Current residential type	
Stay with parents	32 (62.8)
Stay with relatives	17 (33.3)
Stay with own	2 (3.9)

deviation (SD). Inferential statistics, including paired-t test to analyze mean difference between before and after implementing the HLP scores. Statistical significance was set at  $p < 0.05$ . Data were analyzed using the Stata, version 15/IC (StataCorp LP, College Station, TX, USA).

### Results

Study participants comprised of 51 vocational students, where 3 (5.9%) were male students, 46 (90.2%) females, and 2 (3.9%) were LGTB students. Regarding parents’ marital status, a half of students’ parents were living together (52.9%). About 2/3 of youths were living with parents (62.8%) as shown in Table 1.

Results of changes in health literacy showed that mean scores before and after interventional of HLP were statistically significant ( $p < 0.001$ ) in 6 components and overall (Table 2).

### Discussion

Results from the current study observed that there is a significant difference between before and after interventional on student’s health literacy. The result of the present study was consistent with a study by Paopan et al<sup>(29)</sup> to study the effects of health education program on prevention of sexual risk behaviors among female vocational students in Bangkok. The results of the study revealed that after the experiment, the experimental group had significantly higher mean scores of knowledge, attitudes, perceived self-efficacy, outcome expectations, decision making skills, refusal skills, and preventive sexual risk behavior than before the experiment, which has been

**Table 2.** Comparison of the mean score and mean difference on health literacy before-after interventional program on STI/HIV prevention

Health literacy score	n	Mean	SD	Mean difference	95% CI	p-value
1) Access to information and health services						
Before	51	27.0	2.7	4.5	3.6 to 5.5	<0.001
After	51	31.5	1.7			
2) Knowledge and understanding						
Before	51	13.3	2.0	5.1	4.5 to 5.7	<0.001
After	51	18.4	1.1			
3) Communicating skills						
Before	51	21.4	3.2	3.7	2.8 to 4.7	<0.001
After	51	25.1	2.5			
4) Self-management						
Before	51	14.6	2.6	4.1	3.4 to 4.9	<0.001
After	51	18.8	1.0			
5) Media literacy						
Before	51	5.0	1.1	1.0	0.7 to 1.3	<0.001
After	51	6.0	0.0			
6) Decision-making skills						
Before	51	18.8	5.9	8.0	6.2 to 9.7	<0.001
After	51	26.8	2.2			
Total						
Before	51	100.1	10.3	26.5	23.6 to 29.3	<0.001
After	51	126.6	3.8			

SD=standard deviation; CI=confidence interval

statistically significance. The course on sex education, sexual health knowledge and life skills are suitable for age and current social conditions, that is necessary in educational institutions. The vocational schools' administrators must focus on a health promotion program related to sex education in school to reduce sexual risk behavior among vocational students. In addition, parents or guardians should provide support for the activities, strengthen family relationship, and advise on sexual education<sup>(30)</sup>.

This program can increase the level of health literacy on STI/HIV prevention. It has organized activities to create a variety of health learning opportunities, appropriate with the lifestyle of adolescents, emphasizing participation in thinking, doing, expressing opinions in activity group, discussion after receiving enhance knowledge, access to services, critical listening to media communicating, transfer of knowledge, experience, self-management skills, rejection skills, decision-making skills, to increase health literacy, affect the change in sexual behavior in the right way. This is consistent with the research by Laura et al<sup>(31)</sup>, which synthesized the

literature and Meta-analysis on technology-based sexual health interventions among youth. After 15 years of 16 retrospective studies, it was found that interventions were more effective than control programs at improving sexual health knowledge, condom use, abstinence, safer-sex attitudes, and safer sexual activity. The study by Mason-Jones et al<sup>(32)</sup> found that schools may be proper place to provide health services to adolescents which include contraceptive choices as well as condoms, and involve them in the design of services. Incentive-based interventions focus on keeping young people in school may reduce adolescent pregnancy. This corresponded to the study of Phattharakul and Praman<sup>(33)</sup>, which found students should be examining students' fundamental information and providing a participation workshop and learning activities according to students' interests and needs were found to be the appropriate knowledge management approaches to solve problems of students' risky sexual behaviors because these approaches enhance students' awareness of harmful impacts of risky sexual behaviors which resulted in ending or decreasing these risky behaviors.

Students should participate in analytical thinking and express their opinions, reflecting their experiences according to their perception to obtain information about the sexual risk behaviors of the students which are intimate and real, matching the interests, and needs of them. In addition, organizing a student-centered learning process will enable learners to have good learning and to work with others, unity, courage to express opinions. A study on the effect of a sexual health promotion program on pregnancy prevention of teenage in Saraburi Municipal<sup>(34)</sup>, found that the sexual health promotion program in the present study was effective for enhancing knowledge and attitude towards pregnancy prevention among early teenagers. A study of the effects of promoting proper sexual behaviors by positive youth development program among early adolescents, Mueang District, Chon Buri Province<sup>(35)</sup>, found that the program can promote sexual health behaviors among students, consisting of life goals, connectedness, self-confidence, character, compassion, and competence. A study of Rattananam et al<sup>(36)</sup> reported that safe-sex promoting program could enhance knowledge, perceived susceptibility, and perceive severity toward STD and unwanted pregnancy prevention among female adolescents.

The present study had several limitations. Firstly, the assessment of the immediate effects of the training was done without assessing its effect on the end. As for further study, it is suggested to follow-up the present study participants in order to evaluate the long-term effect to the change in behaviors of STI/HIV prevention. Second, the study lacked a control group. Third, the outcome of the current study was the change in health literacy scores, which represented the protection level of STI/HIV-not the change in behavior itself. Lastly, cognitive generated by the program might not be sustainable, which should be trained to maintain the learnings and evaluate further.

## Conclusion

The HLP creates a variety of learning opportunities that are appropriate and relevant to the youth lifestyle. It is also able to enhance health literacy to affect sexually risky behavior modification more than usual education.

## What is already known on this topic?

People with low levels of health literacy are more likely to have risky behaviors, poor self-care, and health problems.

## What this study adds?

Benefit of this study is to know the level of health literacy in prevention of sexually transmitted diseases and sexual experience of Vocational students. The information can be used to develop the health literacy enhancing program on STI/HIV prevention.

## Conflicts of interest

The authors declare no conflict of interest.

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