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ORIGINAL ARTICLE

Effects of a safe sex program for increasing health literacy intention and practice to prevent pregnancy among undergraduates in Thailand

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ABSTRACT

This quasi-experimental study aimed to determine the effects of a safe sex program for increasing health literacy, intention and practice to prevent pregnancy among undergraduates in Thailand from September 2017 to January 2018. Multistage sampling was employed resulting in 73 undergraduates (36 in the experiment and 37 in the control). Data were collected by self-administered questionnaire. The experiment included a 20-week safe sex program. Statistics used to analyze data were descriptive statistics and analytical statistics; chi-square test, Fisher's exact test, paired samples *t*-test, independent samples *t*-test, Mann-Whitney U test and generalized estimating equations. The mean difference for health literacy scores and the practice scores obtained for the experiment were significantly higher than that of the control (*p-value* = 0.002, 95% confidence interval [CI]: 3.43–15.47 and *p-value* = 0.004, 95% CI: 0.27– 1.45). However, the mean difference of scores of intentions regarding condom and Emergency contraceptive pills (ECPs) were not statistically significant between experiment and control. This study indicated that the intervention increased health literacy and practice among undergraduates. These findings may present a novel practical program to prevent teenage pregnancy in this population.

Key words: health literacy, contraception, pregnancy, adolescent's health, safe sex

INTRODUCTION

Youth is the transitional period of human life cycle from childhood to adult.[1] They experience physical, cognitive, emotional and sexual development changes[2], which lead sexual risk behavior resulting in unintended pregnancy and sexually transmitted diseases (STDs).[3] Nowadays developed and developing

countries face unintended pregnancies among youth.[4] It can be depend on individual characteristics and behaviors.[5] The major reasons of teenage pregnancy are misconceptions of sex and misusing of contraception.[6, 7]

In 2016, the birth rate was 44.8 births per 1,000 Thai women aged 15–19 years old[8]. More than half of them experienced first vaginal sexual intercourse at 17 years old, and they did not use contraception.[9] Forgetting of taking pills, insufficient time, reduced pleasure of vaginal sexual intercourse were cause of not using contraceptive.[10] In 2015, the birth rate was 66.3 per 1,000 girls aged 15–19 in Chon Buri (the highest in Thailand).[11] A study shows that the misuse of ECPs has increased. Some teenagers use the pills daily while having unprotected sex.[12]

Health literacy promotes healthy preventive behavior.[13] WHO described health literacy as "the development of the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health".[14] Developed countries people with low level of health literacy had low level of health information accessibility and health services utilization.[15] Poor health literacy associated with low socioeconomic level, which can have adverse effects on health.[16] Sex education can improve social skills and thereby lower unintended pregnancies and STDs.[17] However, in Thailand sex education focuses on anatomy—sex is still considered a taboo issue, and society and parents tend to avoid open discussions about sex.[17]

Many undergraduates' exhibit high-risk sexual behavior and low contraceptive use, leading to unintended pregnancy and few studies have used a health literacy and self-efficacy theory to improve appropriate condom and ECPs use.Therefore a safe sex program should teach preventive methods such as correct and appropriate use of condoms and ECPs. This study aims to determine the effects of a safe sex program for increasing health literacy, intention and practice to prevent pregnancy among undergraduates in Thailand.

METHODS

Study design

This study used quasi-experimental research with three assessment periods (baseline, immediate effect; weeks 8, and follow-up; week 20).

Population sample and sampling technique

The Chonburi province in Thailand is industry and tourism area. Pattaya city is the sex city in the world and it is located in the eastern part of the country. The Ministry of Public Health revealed that this province had the highest rate of teenage childbearing in Thailand.[11] The Lemeshow S's formula [18] was applied to calculate the sample size at a confidence interval (CI) of 95%. The alpha (α) of the test was 0.05 and the power was 0.80. The means difference of intention to prevent unplanned pregnancy among nursing students before and after education[19] was 3.46. Two of four government universities were selected for the study based on size, location, and high rate of teenage childbearing. One was randomly selected to be the experiment while another was the control. A distance of 16 km prevented the sharing of data between participants. Participants were enrolled by multistage sampling technique (Figure 1). Participants were randomized by proportional to size from human and social sciences faculties, and science and related science faculties. The stratified proportionate to size was employed to enroll the undergraduates from the selected

faculties and also their class year. Twenty-seven undergraduates from the human and social sciences faculties and ten undergraduates from the science and related science faculties were enrolled for both universities. Participants were Thai female undergraduates who studied in the first to fourth year of undergraduate. They were available to participate for 20 weeks, had no history of pregnancy, had a boyfriend on the date signing form of consent.

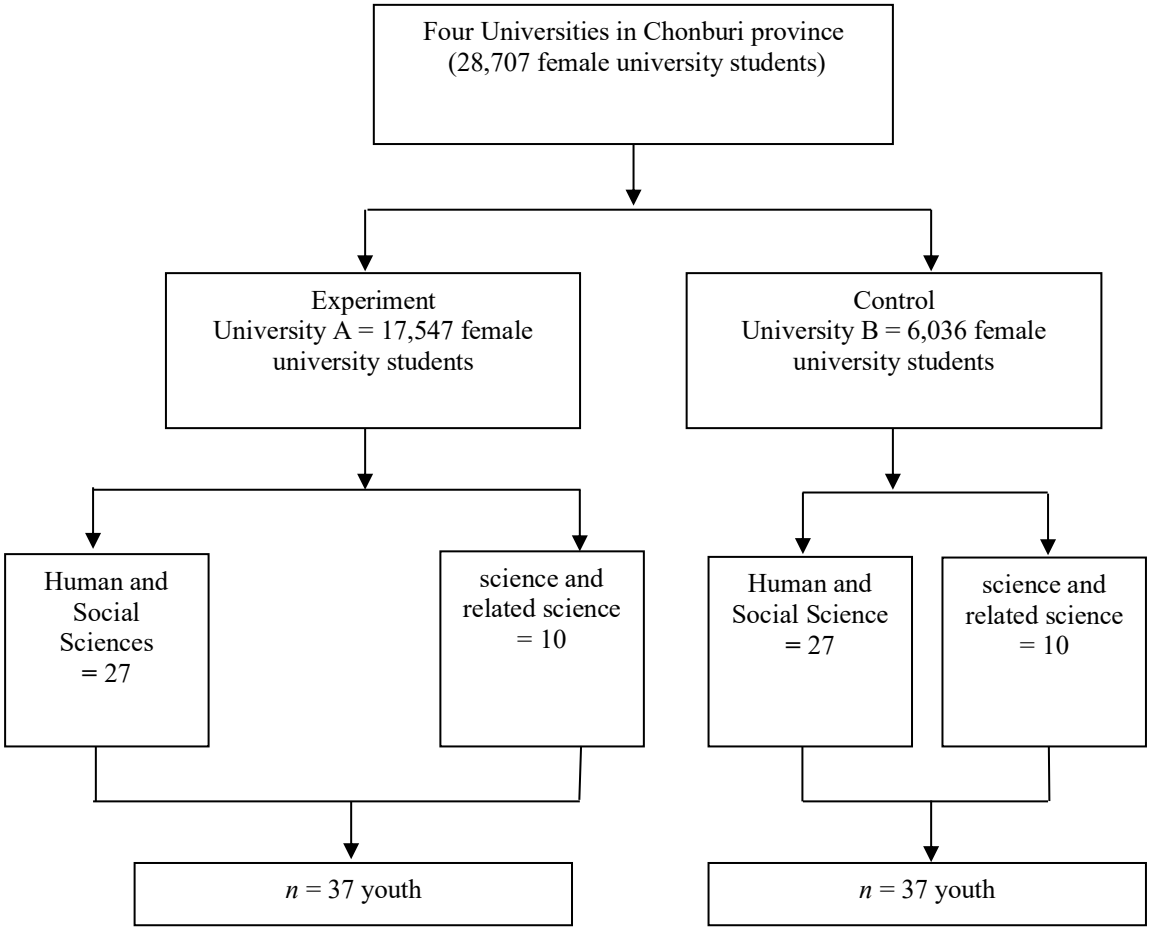

Figure 1 Sampling procedure

Study tools

A self-administered questionnaire was given to both groups at pre-test, post-test and follow-up (after the program implementation). The questionnaire included the following categories: 1) Sociodemographic characteristics (seven questions, including age, overall GPAX, parents' marital status, parents' relationship, current residence type and average income per month); 2) Sexual activities (15 questions, including relationship status, history of hug and kiss and vaginal sexual experience); 3) Knowledge of condoms and ECPs (12 questions, adapted mainly from two studies[20, 21]; 4) Attitudes toward condom and ECPs use (12 questions, adapted mainly from two studies[22, 23]; 5) Perceived self-efficacies and expectation of condom and ECPs use (12 questions, adapted mainly from: from two studies [24]; 6) Social and environmental factors (peer norms and

social media influence, and accessibility of contraceptives) (17 questions, adapted mainly from two studies[25, 26]; 7) Health literacy regarding condom and ECPs use (38 questions); 8) Intention on condom and ECPs use (6 questions, adapted from two studies[16, 27]; 9) Practice for condom and ECPs use (two questions, adapted mainly from one study[28]. Parts three to nine of the questionnaire used Likert scale. Five experts of adolescents and health behavior verified questionnaire validation. The IOC index value was 0.78. Questionnaire was tested for reliability among 30 under-graduates with resemble characteristics to the participants. The Kuder-Richardson 20 (KR-20)[29] was 0.71 for knowledge of condoms and ECPs. The Cronbach's alpha[30] was 0.72 for attitudes toward condoms and ECPs, 0.71 for perceived self-efficacies and expectation on condom and ECPs use, 0.70 for social and environmental factors, 0.90 for health literacy on condom and ECPs use and 0.71 for intentions to use of condoms and ECPs. These results were considered acceptable.

The twelve questions regarding knowledge of condoms and ECPs had total possible score of twelve points. The twelve attitudes questions with 5-point Likert scale had total score of forty – eight. The twelve perceived self-efficacies and expectations of condom and ECPs use questions were scored as well as attitudes questions, with a total possible score of forty – eight. The social and environmental factors had seventeen questions scoring by 5-point Likert scale, with eighty – five of total possible score. The thirty-eight questions about health literacy regarding condoms and ECPs use had a total possible score of one hundred and fifty - two scoring by 5-point Likert scale. The six questions about intentions on condoms and ECPs were scored using a 5-point Likert scale, with a total possible score of twenty – four. The practice for condom and ECPs use score was classified into two levels. A score of less than 10 was referred to as an inappropriate practice. A 10 score was referred to as appropriate practice because the youth must use condoms and not use ECPs for preventing HIV/AIDS and avoiding side effect from ECPs.

Intervention

The safe sex program was developed based on results and recommendations from phase 1, health literacy principle, and self-efficacy theory. The program consisted of seven activities and was carried out for two hours, once a week over a period of eight weeks, using applied edutainment methods. The seven activities included: 1) Introduction to the safe sex program; 2) "Knowing about condoms and ECPs"; 3) "Existing solution selection"; 4) "Communication and creating understanding"; 5) "Realizing self-values"; 6) "Life's path"; and 7) "Verifying if the information is reliable".

In the follow-up phase was post - test in the experiment and control. After the post-test, both groups received a "Handbook of Adolescent and Youth on Preventive of Unintended Pregnancy". There were three research assistants (RAs)—fourth-year undergraduates in the Public Health faculty who passed an evaluation and participated on a voluntary basis. The training course covered contraceptives, condoms and ECPs, health literacy and self-efficacy theory, teenage pregnancy, risk behavior, teaching skills, communication skills, data collection skills, and familiarization with the program. The course was administered one month before the recruitment process. After training, the researcher evaluated the assistants' performances. The assistant with the appropriate performance led the teaching program while the other two collected data.

Data collection

The program was implemented from September 2017 to January 2018 over a 20-weeks period. The safe sex program was implemented for eight weeks. A program assessment was done at the end of the intervention and 12 weeks after intervention.

Data analysis

Descriptive statistics were used to describe the frequency, percentage, mean, minimum, maximum and standard deviation was used for analysis of socio-demographic characteristics, sexual activity factors, knowledge of condoms and ECPs, attitudes toward the use of condoms and ECPs, perceived self-efficacy of contraceptive use, expectations of contraceptive use, social and environmental factors, health literacy for pregnancy prevention and intention or practice for the use of condoms and ECPs data.

Socio-demographic differences between the experiment and control were tested using a chi-square, Fisher exact tests. A comparison of health literacy, intention and practice between the two groups was done before, after, and during follow-up three months after program implementation. Normality was tested for health literacy measured at baseline, and at weeks eight and 20 using a Shapiro-Wilk test statistic. A Man-Whitney test was used to compare the score when the scores exhibited a non-normal distribution by median, and *p*-values. Independent sample t-tests were tested to compare the score when the scores were normally distributed by mean (95% confidence interval, 95% CI) and standard deviation of total scores in each subscale. Generalized Estimating Equations (GEEs) were tested to analyze the overall program between the groups because the GEEs were used for analyzing repeated data and were used for irregularly-timed by used. A Caucasian family was used for the normality outcome and Gaussian family for non-normal distribution and an identity link for the scale outcomes as link functions, and the working correlation matrix was selected to be unstructured. A mean difference with 95% CI to assess the effects of the program was used. Statistical significance was considered when the *p-value* was < 0.05.

Ethical considerations

Ethical approval was certified by Burapha University with code number: Hu 114-2560. Participants were explained about the research objectives, methods, benefits and collection process for data. Each participants signed informed consent from for this research. To protect their privacy, code names were utilized and data was kept confidential.

RESULTS

Thirty-seven undergraduates from college a made up the experiment, and 37 undergraduates from university B were the control. One undergraduate in the experiment was expelled from the university. In total, then, 73 college s were part of the final analysis. Participants in both groups were similar (Table 1).

Table 1 Demographic characteristics of intervention and comparison groups (n = 73)

Demographic characteristics	Experiment (n = 36)	Control (n = 37)	*p*-value
	Number (%)	Number (%)	
Age (years)			0.72[a]
≤ 20	20 (55.6%)	19 (51.4%)	
> 20	16 (44.4%)	18 (48.6%)	
$\bar{x}$ = 20.27, SD = 1.19, Min = 18, Max = 23			
Grade average point			0.74[a]
≤ 2.5	10 (27.8%)	9 (24.3%)	
>2.5	26 (72.2%)	28 (75.7%)	
Parents' marital status			0.74[a]
Separated	10 (27.8%)	9 (27.3%)	
Married	26 (72.2%)	28 (75.7%)	
Average income per month (baht)			0.12[a]
≤ 5,000	6 (16.7%)	12 (32.4%)	
> 5,000	30 (83.3%)	25 (67.6%)	
$\bar{x}$ = 8,336.99, SD = 5,424.95, Min = 3,000, Max = 40,000			
Current residence type			0.06[a]
Living of campus	31 (86.1%)	25 (67.6%)	
Living on campus	5 (13.9%)	12 (32.4%)	
Live with boyfriend			0.21[a]
Yes	9 (25.0%)	5 (13.5%)	
No	27 (75.0%)	32 (86.5%)	
History of hug and kiss			0.26[b]
Yes	34 (94.4%)	31 (83.8%)	
No	2 (5.6%)	6 (16.2%)	
History of vaginal sexual intercourse			0.50[a]
Yes	26 (72.2%)	24 (64.9%)	
No	10 (27.8%)	13 (35.1%)	
Alcohol consumption over the last six months			0.87[a]
Yes	15 (57.7%)	14 (58.3%)	
No	11 (42.3%)	10 (41.7%)	
Previous use of ECPs			0.40[a]
Yes	15 (57.7%)	11 (45.8%)	
No	11 (42.3%)	13 (54.2%)	
Condom use			1.00[b]
Yes	24 (92.3%)	23 (95.8%)	
No	2 (7.7%)	1 (4.2%)	
Knowledge of condom and ECPs			0.30[a]
Poor	9 (25.0%)	14 (37.8%)	
Moderate	19 (52.8%)	19 (51.4%)	
High	8 (22.2%)	4 (10.8%)	
Attitudes towards condoms and ECPs			0.35[b]
Moderate	3 (8.3%)	1 (2.7%)	
Positive	33 (91.7%)	36 (97.3%)	

Demographic characteristics	Experiment (n = 36)	Control (n = 37)	*p*-value
	Number (%)	Number (%)	
Perceived self-efficacy and expectations of condoms and ECPs			0.33[a]
Poor	8 (22.2%)	8 (21.6%)	
Moderate	13 (36.1%)	8 (21.6%)	
High	15 (41.7%)	21 (56.8%)	
Social and environmental factors			0.65[b]
Poor	1 (2.8%)	2 (5.4%)	
Moderate	33 (91.7%)	31 (83.8%)	
High	2 (5.5%)	4 (10.8%)	

A comparison of health literacy between the groups was conducted before, after, and during a follow-up three months after program implementation. The mean difference for health literacy scores for the experiment was significantly higher than the control (*p-value* = 0.002, 95% confidence interval [CI]: 3.43–15.47) after intervention. Although a mean difference was reported for intentions regarding condoms and ECPs use, this difference had no statistical significance (*p-value* = 0.111, 95% CI = -2.22–2.15). The practice scores of undergraduates who had vaginal sexual intercourse was analyzed. The mean difference of the experiment was statistically significant higher than the control (*p-value* = 0.004, 95% CI: 0.27–1.45), as shown in Table 2.

Table 2 Comparison of the health literacy scores, intention scores and practice scores between the experiment and comparison group before and after the intervention

Time	Experiment (*n* = 36)		Control (*n* = 37)		Mean difference	95% CI		*p*-value
	Mean	SD	Mean	SD		Lower	Upper	
Health literacy scores								
Overall	105.29	-	102.47	-	9.45	3.43	15.47	0.002[c]
Baseline	96.89	15.49	107.65	16.22	-10.76	-18.17	-3.35	<0.001[a]
Week 8	91.50	14.51	101.78	15.54	-10.28	-17.31	-3.26	<0.001[a]
Week 20	130.50[d]	22.00[e]	97.97	18.83		-	-	<0.001[b]
Intention scores								
Overall	19.43	-	18.24	-	0.96	–0.22	2.15	0.111[c]
Baseline	17.39	3.60	20.00[d]	7.00[e]		-	-	0.038[b]
Week 8	21.00[d]	6.00[e]	19.00[d]	7.00[e]		-	-	0.043[b]
Week 20	20.50[d]	4.00[e]	16.89	4.20		-	-	<0.001[b]
Practice scores								
Overall	8.63[c]	-	7.89[c]	-	0.86	0.27	1.45	0.004[c]
Baseline	8.50[d]	4[e]	8.50[d]	3[e]		-	-	0.653[b]
Week 8	9.00[d]	1[e]	8.00[d]	3[e]		-	-	<0.001[b]
Week 20	9.00[d]	2[e]	7.88	1.36		-	-	0.025[b]

[a] Independent samples test, [b] Mann-Whitney U test, [c] Generalized Estimating Equations, [d] Median, [e] Interquartile range

DISCUSSION

The participants in the experiment became more health literate and showed better use of condoms and ECPs following intervention.

1. Comparison of health literacy scores between the experiment and the control before and after intervention, and at 3rd three month follow-up after implementation of the safe sex program.

The mean health literacy scores in the experiment were statistically significant higher than in the control. The experiment completed the safe sex program, which included all the components of health literacy [31]. The participants increased their health literacy levels through various learning methods and was also found in a study in Thailand, especially the live-modeling technique. Observational learning promoted health literacy [32]. Overall, adolescents found the safe sex program, which applied the emotional-arousal principle in conjunction with edutainment, to be interesting and engaging. The program prepared the participants for learning. Adolescents are sensitive, thus appropriate method should be obtain to abstain from unplanned negative events [33-35].

2. Comparison of intention and practice scores between intervention and comparison groups before and after intervention, and at three month follow-up after implementation of the safe sex program.

Results showed that there was no significant difference in the intention scores between the experiment and the control. The short-duration implementation of program was the most important factor affecting intention to change amongst participants. Program length was limited by the undergraduates' timetables. This study was designed to last only eight weeks to make it fit a normal schedule. Ending period of semester was an obstacle to extend intervention period. To boost at semester termination is suggested, social media and online communication can support undergraduates in maintaining their practice[36].

The practice scores were only analyzed for participants who had partaken in sexual intercourse. Results revealed a significant difference between the groups. Research assistants (RAs) were a crucial component in the success of the results. They were recruited from among the fourth-year undergraduates, and they were trained about content of preventive pregnancy and communication skill of safe sex [37]. Since RAs similar peer-led sex educator on teenage and reproductive health, they worked well with undergraduates; this was further facilitated by the fact that RAs were close in age to participants and faced similar life situations. The participants' intentions and behaviors concerning condom and ECPs use improved with RA involvement[38-40]. However, previous study presented about the ineffective of peer-led education to change teenager behaviors [41].

CONCLUSION

The safe sex program was designed to promote appropriate condom and ECPs use by increasing undergraduates' health literacy on unintended pregnancy using peer-led education. The similar ages and life situations of RAs and participants led to an increase in the validity of the information. The program increased participants' health literacy and improved their practice of condom and ECPs use.

LIMITATIONS AND RECOMMENDATIONS

Industrial and tourism were context in this study; to generalize the research results, it is necessary to be aware of these

contexts. Therefore, new intervention should be constructed and tested the effectiveness of improvement about the intention of using condoms and ECPs properly to prevent unintended pregnancies among undergraduates in order to appropriate to each context. Although the study result showed that living off campus may affect unintended pregnancies, more qualitative research is required to substantiate these facts.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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