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Article

Developing and evaluating the Teen-Strong life skills programme in Southern Thailand

Treenut Pummanee [1,*], Sopen Chunuan[1], Yacob G. Tedla[2], Shutiwan Purinthrapibal[1], and Nichara Chupon[3]

[1]Faculty of Nursing, Prince of Songkla University, Hat Yai, Songkhla 90110, Thailand, [2]Division of Epidemiology, Department of Medicine, Vanderbilt University Medical Center, Nashville, TN 37203, USA and [3]Quality of Service and Academic Systems, Thepha District Public Health Office, Thepha, Songkhla 90150, Thailand

*Corresponding author. E-mail: treenutsent@gmail.com

Summary

Risk sexual behaviours are known as a threat to health and wellbeing of adolescents. Although there are standard sexual education curriculums in Thai schools, most schools use traditional teaching methods rather than participatory teaching activities. This study aimed to (i) develop 'Teen-Strong' programme by combining the concept of the World Health Organization's life skills programme with Thai sexual education curriculum and (ii) investigate the association of Teen-Strong programme with knowledge and decision-making regarding risky sexual behaviours and teenage pregnancy in Thai adolescents. The Teen-Strong programme was developed by means of experts review and cognitive interviewing process and evaluated in 66 adolescents in Grades 7–9 from six schools in southern Thailand. Twenty-six students were assigned to the experimental group (attended Teen-Strong programme and standard sexual education) and 40 to the control group (attended only the standard sexual education). A pre–post-test quasi-experimental design was used and the Teen-Strong questionnaire (TSQ) was administered to measure knowledge and decision-making at three time points: before (T1), immediately after (T2) and 1 month after (T3) attending the programme. A 2×3 mixed-design ANOVA was used to analyse the data. TSQ scores in the experimental and control groups were higher at T2 and T3 as compared with T1. Mean increase in TSQ scores at T2 and T3 compared with T1 were significantly higher in the experiment than the control group [T2 vs. T1: $t(64) = 4.07$, p-values < 0.0001; T3 vs. T1: $t(64) = 3.32$, p-values $= 0.017$]. This study showed that Teen-Strong programme could increase adolescent's knowledge and decision-making skills regarding risk sexual behaviours.

Lay Summary

Sexual practices during adolescence are shown to cause teenage pregnancy and other threats to the health and wellbeing of adolescents in Thailand. Adolescent sexual education that considers the culture and environment where adolescents grow up is essential. Although there are sexual education programmes in Thai schools, most schools use traditional teaching methods (i.e. learning through memorization) rather than participatory teaching activities (i.e. learning through activities and sharing experiences from and with peers). We developed a programme called 'Teen-Strong' by combining

participatory learning technique proposed by the World Health Organization with the Thai sexual education programme and evaluate whether this hybrid programme helped Thai adolescents in Grades 7–9 to better understand and avoid risky sexual behaviours. We found that adolescents who were involved in the Teen-Strong programme showed better knowledge and decision-making skills at avoiding risky sexual practices than adolescents who were not involved in the programme. Our findings show participatory sexual education programme could enhance adolescents' understanding of risky sexual practices and strategies to avoid these risky practices.

Key words: adolescent, life skills, programme evaluation, sexual risk, teenage pregnancy

INTRODUCTION

Sexual risk behaviours threaten adolescents' health and well-being because of negative consequences such as the risk of HIV/AIDS, other sexually transmitted diseases and problems with teenage pregnancy (Browning and Malave, 2015). For HIV/AIDS, the Thai government and National AIDS Committee have developed and approved the National AIDS Strategic Plan to end the AIDS epidemic by 2030 (National Aids Committee, 2015). However, few policies addressing the consequences of sexual risk behaviours have been implemented. Thailand has ranked second in teenage pregnancy among Southeast Asian countries in the past 10 years (United Nations Population Fund, 2014), and in 2013, 53.8 out of 1000 live births in Thailand were from teen mothers under age 20, which was 10 times higher than in Singapore. The UNICEF (2018) situation analysis of Thai adolescent pregnancy found that the reasons for teen pregnancy include a lack of knowledge about contraception, specifically a lack of negotiating power to protect their right to demand the use of contraception in girls. Also, inconvenience access to birth control and other reproductive health services and negative attitudes and behaviours of teachers, parents and service providers hinder access to adolescents' health services. The Thai Ministry of Public Health has listed teenage pregnancy as a health priority and set to cut the teenage birth ratio to 25 per 1000 live births by 2026 (UNICEF, 2018). To achieve this goal, stakeholders need to develop strategies to help prevent sexual risk behaviours that lead to teenage pregnancy in Thailand.

Curriculum-based health education approaches to promote adolescent health, underpinned by social learning theory (Bandura, 1986), which emphasizes skills-based training and interaction between participants, and 'peer-to-peer learning' including other teaching strategies (Hromek and Roffey, 2009; Herbert and Lohrmann, 2011) have been accepted worldwide as effective approaches. The World Health Organization's (WHO) life skills programme (Programme on Mental Health, World Health Organization Geneva, 1997) is an important health education programme based on social learning processes. Life skills education is designed to promote psychosocial skills and empower children and adolescents to protect their rights in risky situations (Department of Mental Health, World Health Organization, Geneva, 1999). In particular, it focuses on supporting adolescents to translate knowledge, attitudes and values into real-life abilities (e.g. what and how to behave). Furthermore, activities used in the teaching of life skills build upon participatory learning, which aims to develop adolescents' experiences by learning from other peers' experiences, and these activities can be used worldwide (Programme on Mental Health, World Health Organization, Geneva, 1997).

Since 1977, WHO's life skills programme has been used as a guide to promoting health and mental health in several countries (e.g. prevention of HIV/AIDS in Zimbabwe and Thailand, prevention of adolescent pregnancy in Mexico, child abuse prevention in the UK and prevention of substance abuse and violence in the USA) (Department of Mental Health, World Health Organization, Geneva, 1999). However, life skills programmes, like the one developed by WHO, have rarely been developed to promote and prevent sexual risk behaviours and teenage pregnancy among Thai adolescents (Boonmongkon and Thaweesit, 2009). According to a recent review of the sexual education curriculum in Thai secondary schools, most schools used traditional teaching methods (58.1%) that focus on teacher-centred approaches and an inflexible lecture style. In contrast, only 32.7% of schools included lectures and participatory learning activities, such as peer discussion, experience sharing and brain storming (Ministry of Education, 2016). Reviews of the recent health education curricular findings supported that effective health education in the classroom should be delivered by trained teachers who employ a variety of active learning strategies and dedicate time to involve students in skills practice (Herbert and Lohrmann, 2011). Furthermore, studies

have found that teachers who help students express their own ideas and encourage an open environment for peers to learn from each other achieve better outcomes than traditional teaching (Lee *et al.*, 2015; Ministry of Education, 2016).

To create a curriculum that involves active learning strategies to promote health for adolescents, it is essential to consider the culture and environment where adolescents grow up, the way adolescents think and behave, and how adolescents perceive their own behaviours (Sridawruang *et al.*, 2010; Ounjit, 2015). Most importantly, the curriculum should be designed based on the learning capacity, gender, sexual diversity, reproductive rights of adolescents (Lee *et al.*, 2015; Ministry of Education, 2016) and should be incorporated with other core subjects (Mutalip and Mohamed, 2012).

Given the applicability of WHO's life skills programme in Thailand, we developed a programme called 'Teen-Strong' utilizing WHO's life skills programme and the standard sexual education curriculum from the Thai Ministry of Education for students in Grades 7–9. We further investigated the feasibility of the Teen-Strong programme by applying the programme among Thai adolescent students aged 12–14 years. This study was designed to develop and evaluate whether Teen-Strong life skills programme increases the knowledge and decision-making skills regarding sexual risk behaviours and teenage pregnancy in Thai adolescents in Grades 7–9 at three time points: T1—before participating, T2—immediately after participating and T3—1 month after participating in the programme. We hypothesized that the experimental group (i.e. adolescents who participated in the Teen-Strong programme) would have better knowledge and decision-making skills to prevent risky sexual behaviours and teenage pregnancy compared with control group (i.e. adolescents who attended the standard sexual education curriculum).

METHODS

This study used a pre–post-test quasi-experimental design. There were two phases: (i) developing the Teen-Strong programme; and (ii) evaluating the Teen-Strong programme by implementing the programme in an experimental group.

Phase 1: Teen-Strong programme development

To develop the programme, the concept of WHO's life skills programme (Department of Mental Health, World Health Organization, Geneva, 1999) and the basic education core curriculum by the Thai Ministry of Education related to health and physical education (since 2008 to current) for Grades 7–9. Thai students were chosen as the guiding framework. Seven steps were followed to develop and assess the feasibility the Teen-Strong programme as shown in Figure 1.

Pretesting the Teen-Strong programme

In step sixth, we conducted cognitive interviews with 20 selected adolescents (aged 13–14) in Grade 8 from four different schools in southern Thailand to assess if Teen-Strong version 3 could be understood and implemented in schools. We completed implementation of Teen-Strong version 3 within 3 days and held a 1-h focus group discussion. The final step was to create the final version of the Teen-Strong programme based on the results of the cognitive interviews.

Final version of the Teen-Strong programme

The final version of the Teen-Strong programme had eight lessons, each 50 min long, and was given over 3 days. Topics and activities were based on four strategies included in the final Teen-Strong version as shown in Table 1. The first strategy focused on increasing adolescents' knowledge of sexual risk behaviours and teenage pregnancy. The second strategy focused on enriching decision-making skills to deal with sexual incidents stressing on the most challenging sexual situations. The third strategy focused on improving adolescents' self-awareness and empathy towards themselves and peers when they face the consequences of sexual risk behaviours. The final strategy focused on enhancing creative thinking towards the consequences of sexual risk behaviours. Participatory learning and role playing based on the beliefs of Thai culture were used to deliver the programme.

Phase 2: programme evaluation

Participants and setting

Students from 14 provinces in southern Thailand from major and minor secondary schools were invited to join this study if they met the eligibility criteria: (i) their school did not have any life skills education related to HIV-AIDS and teenage pregnancy prevention from outside organizations; (ii) they were 12–14 years old and were in Grades 7–9; (iii) they were willing to take part in this study; and (iv) their school principal and parents allowed them to participate in this study. We found 80 students from six schools in four provinces matching the eligibility criteria and were willing to participate. They were assigned to either the experimental group (participated in the Teen-Strong programme as well as

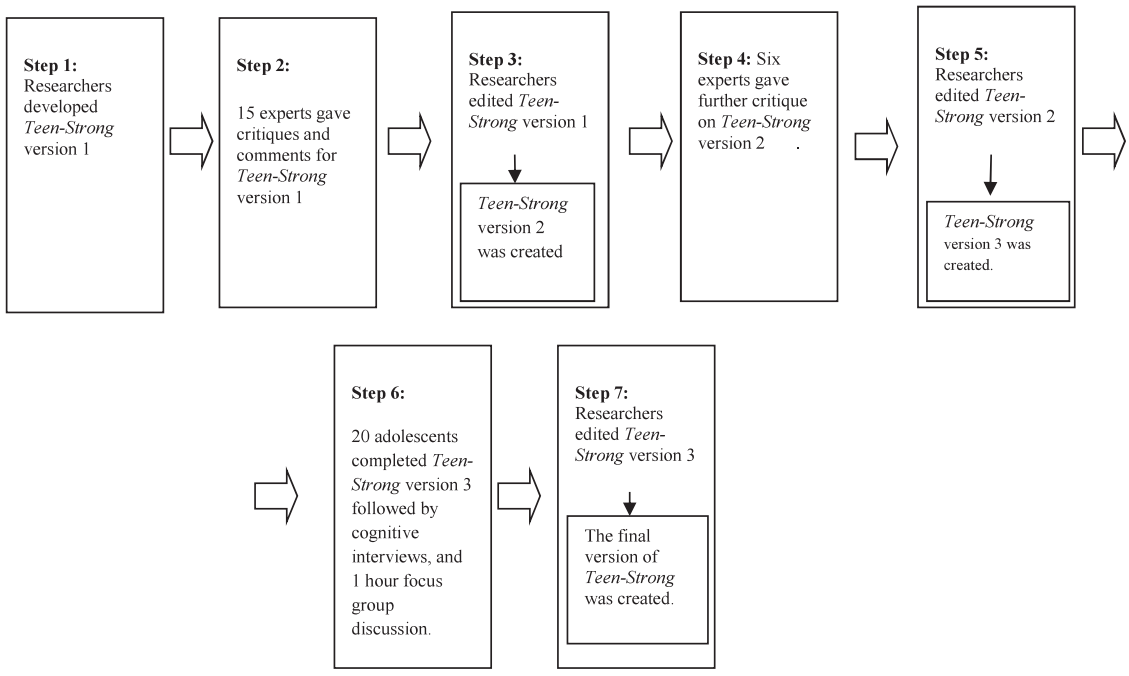

Fig. 1: Seven steps of the Teen-Strong programme development.

the standard school sexual education programme) or the control group (attended only the standard school sexual education programme) by their teachers (who had no knowledge of the intervention) in a random fashion but not strictly following true randomization. The participants in the experimental group travelled from their provinces to Songkhla province where they stayed in a hotel for 3 days to complete the Teen-Strong programme. Two volunteer teachers from each school helped take care of the students during this process. Due to personal reasons, 14 participants from the experimental group did not travel to the intervention site and this decreased the experimental sample size to 26 and the total sample size to 66. Each participant in the experimental group was compensated for their travel, hotel and meal expenses by the researchers.

Instrument

A questionnaire was used to collect data from both the experimental and control groups before (T1), immediately after (T2) and 1 month after (T3) the experimental group participated in the Teen-Strong programme.

The Teen-Strong questionnaire (TSQ), which assessed knowledge and decision-making skills for preventing sexual risk behaviours, was developed by the researchers. There were two parts of the TSQ which included 22 True or False type questions and two open-ended questions with a total score of 22. The TSQ consists of four sections. Section A has eight items about knowledge of sexual organs and development (e.g. 'The most sensitive organ that can arouse sex in males is the penis'. 'Whenever your boyfriend or girlfriend touches some part of your body such as the breast or sex organ, you can be sexually aroused'). Section B has four items about the consequences of sexual risk behaviours (e.g. 'Having sexual intercourse during menstruation can cause infection only but not pregnancy'. 'Having sexual intercourse only one time can cause pregnancy'). Section C has five items about how to prevent pregnancy (e.g. 'For emergency contraceptive medicine, you should take the first pill within 72 hours after having sexual intercourse and the second pill 12 hours after the first pill'. 'Ejaculation outside the vagina can prevent pregnancy 100 percent'). Section D has five items related to decision making for challenging sexual situations (e.g. 'The three methods to say "no" when you are asked to have sexual intercourse are repeated refusal, bargaining, and extending to another time'. 'If you are asked to have sexual intercourse, the best way is to say "no" and to leave the place'). For the purposes of this study, the higher the total score (total score of 22), the higher the knowledge and decision-making skills for preventing sexual risk behaviours. The open-ended questions were

Table 1: Overview of Teen-Strong programme activities

Component	Activities with participatory learning	Objectives
1: Walk rally	• Play games.	• Build friendships and emphasize how to work as a team.
2. Rule Game	• Set ground rules.	• Understand the rules and equality among the group member.
3. Exploring the heart questions	• Divide members into group. • Write group ideas on flip charts. 1. Can you explain the current situation of teenage pregnancy based on your idea? 2. What is the cause of teenage pregnancy? 3. What are the characteristics of people who tend to have teenage pregnancy? 4. What do teenagers do when they know that they got pregnant? 5. What do you feel about teenage pregnancy? 6. What can you do to prevent teenage pregnancy if you are a peer leader for preventing teenage pregnancy? • Present.	• Learning from peers by reading and listening without debate. • Active sharing of attitudes, creative thinking, decision making for consequences of sexual risk behaviours.
4. Let's learn about our bodies	• Divide members into same-sex group. • Each group draws a picture of the human body on their group flip chart based on their own physical sex. • Present.	• Understand anatomy and function of human sexual organs, the major areas that easily lead to sexual arousal of both sexes. • Understand how to communicate with others (both sexes) about sex organs taking into account Thai culture and gender differences.
5. Let's think	• Divide members into group. • First groups discuss 'What will happen if you have sexual intercourse while you are a student?' • Next groups discuss 'What is the cause of sexual intercourse among adolescents?' • Then ask participant to write their independent idea on individual paper. • Post each individual paper on the central flip chart, to show to others.	• Learn the consequences of sexual risk behaviours, factors that stimulate adolescents to get into sexual risk behaviours.
6. Nine Bingo!	• Give participants a bingo card generator that shows nine statements about experiences regarding sexual risk behaviours (for example 'I know about contraceptive medicine'). • Let participants to find peers who have had the same experiences as stated in a bingo card. • Those who get names of peer in a row on the bingo card win the game.	• Learn from peers' experiences. • Create assertiveness, self-esteem and sociability by sharing experiences with peers.
7. Role play	• Role play based on three situations related to the consequences of sexual risk behaviours which are integrated from knowledge from the previous activities 1–6.	• Show inter-personal skills and decision making skills to solve consequences of sexual risk behaviour.
8. Heart to heart	• Bring the flip chart answers from activity #*3* and ask participants to reconsider their answers. • Ask participant to write any changes in their attitudes toward adolescents experiencing consequences of sexual risk behaviours.	• Re-thinking answers to questions after participating in the programme. • Being self-aware and clarifying positive values towards peers and adolescents who have problems with sexual risk behaviours.

asked only to participants in the experimental group at T2 to obtain a more in-depth understanding of how they benefitted from this programme ('What have you gained by participating in the programme and what would you change after participating in this programme?')

The content validity of the TSQ was assessed by six experts. Three of the experts were nursing professors (two were familiar with developing sex education curriculum for adolescents and another was a specialist in testing research measurements). The three other experts on the panel were secondary school teachers who had worked with HIV-AIDS prevention programmers among adolescents. The panel of experts gave several suggestions and necessary corrections on the TSQ. The final TSQ was used after the experts reached consensus on the content and wording. The Cronbach's alpha value of the TSQ was 0.71 after testing the reliability among similar aged adolescents ($n = 30$) in different schools.

Data analysis

A 2 × 3 mixed-design ANOVA was employed to compare the means of the TSQ scores over time [i.e. before (T1), immediately after (T2) and 1 month after (T3) completing the Teen-Strong programme] within the different groups as well as to compare the TSQ score between experimental and control groups during the different time points. In addition, an interaction of group by time was used to assess if the change in the means of the TSQ score over time (T1 vs. T2 and T1 vs. T3) was different between the adolescents in the experimental and control groups. Tukey's HSD *post hoc* test was used to explore differences between multiple group means and identify which particular differences between pairs of means were significant. A two-tailed p-value < 0.05 was considered statistically significant. All analyses were performed using Stata 14 (StataCorp, 2015). The responses to the open-ended questions were summarized and grouped into themes using thematic analysis procedures suggested by Braun and Clarke (2006). The process started with repeated reading to build familiarity with the text data, generate initial codes, search for themes based on the initial coding, review the themes and then define and naming themes before final reporting. Four investigators made a consensus discussion to identify and confirm critical themes.

RESULTS

Quantitative results

The participants had a mean age of 13.7 (SD = 0.74) years, 57.6% were female and 42.4% were males (Table 2). About 66% of the participants were Buddhist, parents of most participants (84.25%) were married and lived together and most participants lived in families with a medium socioeconomic status based on their parents' monthly salaries. There was no difference in socio-demographic characteristics between the experimental and the control groups (p-values > 0.05 in all).

An 2 × 3 ANOVA table (Table 3) indicates that there was a significant difference across the three time points [$F(2, 66) = 52.2$, p-values < 0.01], a significant difference between the two intervention groups [$F(1, 66) = 20.3$, p-values < 0.01] and significant interaction between time and intervention groups [$F(3, 66) = 8.4$, p-values < 0.01] in the mean TSQ score. Tukey's post hoc test (Table 4) showed that there were significant differences in the mean score of TSQ in experimental groups between T1 (M = 6.81, SD = 3.72) and T2 (M = 15.58, SD = 2.02) [t (25) = 8.19, p-values < 0.001), and between T1 (M = 6.81, SD = 3.72) and T3 (M = 14.65, SD = 3.07) [t (25) = 7.33, p-values < 0.001]. We also found a significant difference in mean TSQ score in control groups between T1 (M = 7.25, SD = 4.74) and T2 (M = 10.43, SD = 4.53) [t (39) = 3.68, p-values < 0.001] and between T1 (M = 7.25, SD = 4.74) and T3 (M = 11.78, SD = 3.56) [t (39) = 5.24, p-values < 0.001]. The TSQ means in T2 and T3 were higher than in T1 for both experimental and control groups (Figure 2). However, there was a significant interaction between group and time indicating that the change in the mean TSQ score between T2 and T1 was significantly higher in the experimental group than in the control group [(change in the mean in experimental group = 8.77, SE = 1.07) vs. (change in the mean in control group = 3.18, SE = 0.86); t (64) = 4.07, p-values < 0.001]. Similarly, the mean change between T3 and T1 was significantly higher in the experimental group than the control group [(change in the mean in experimental group = 7.3, SE = 1.07) vs. (change in the mean in control group = 4.53, SE = 0.86); t (64) = 2.42, p-values = 0.017]. In addition, the Cohen's d effect sizes (Cohen, 1992) for the difference in TSQ means between T1 and T2 and between T1 and T3 within the experimental group (2.93 and 2.30) were larger than the control group (0.69 and 1.81), respectively.

Tukey's HSD post hoc test (Table 5 and Figure 2) also indicated that there was no significant difference in TSQ means between the experimental (M = 6.81, SD = 3.72) and the control groups (M = 7.25, SD = 4.74) before starting the Teen-Strong at baseline T1 [t (64) = –0.45, p-values = 0.65]. However, after the experimental group attended the Teen-Strong programme, we found that the TSQ means in the experimental group (M = 15.58, SD = 2.02) were statistically significantly higher than the TSQ means in the control group (M = 10.43, SD = 4.54) at T2 [t (64) = 5.30, p-values <

Table 2: Participant demographic characteristics

Variables	Experimental group ($n = 26$)		Control group ($n = 40$)		T-test or chi-square score (p-value)
	Mean (SD)/frequency	Per cent	Mean (SD)/frequency	Per cent	
1. Age	13.69 (0.74)		13.80 (0.72)		–0.59 (0.55)
2.Sex					
Male	11	42.3	17	42.5	0.00 (0.99)
Female	15	57.7	23	57.5	
3. Religious affiliation					
Buddhism	18	69.2	25	62.5	0.31 (0.058)
Muslim	8	30.8	15	37.5	
4. Parents marital status					
Married	23	88.5	32	80.0	3.8 (0.43)
Separate	0	0	2	5.0	
One of parent passed away	1	3.8	0	0	
Both parents passed away	1	3.8	2	5.0	
Divorce	1	3.8	4	10.0	
5. Salary of youth per month	1389.61 (1006.85)		1410.57 (700.33)		–0.099 (0.92)

Table 3: Repeated measure ANOVA contrasting difference in the Teen-Strong questionnaire (TSQ) scores across factors of group and time

Source	SS	*df*	MS	F	Sig
Group	302.5	1	302.5	20.3	0.0000
Time	1554.2	2	777.1	52.2	0.0000
Group#Time	249.5	3	124.7	8.4	0.0003
Model	1941.6	5	388.3	26.1	0.0000

Number of observations = 66; Adj $R^2 = 0.39$.

0.001]. Likewise, the TSQ means in the experimental group (M = 14.65, SD = 3.07) were statistically significantly higher than the TSQ means in the control group (M = 11.78, SD = 3.56) at T3 [t (64) = 2.96, p-values = 0.003]. Cohen's d effect size for the difference in TSQ means between experimental and control groups were 0.10, 1.47 and 0.86 for T1, T2 and T3, respectively.

Qualitative results

We found two themes from the response of the open-ended questions 'What have you gained by participating in the programme and what would you change after participating in this programme?'

1. Enhanced skills and knowledge and self-efficacy to prevent sexual risk problems and teenage pregnancy

After completing the programme, participants reported they were satisfied with the programme and the programme helped them increase their knowledge and understanding of effective skills on preventing sexual risk problems and teenage pregnancy. Participants also reported that they would implement the skills and knowledge to help themselves and friends avoid sexual risk problems and teenage pregnancy. Participants felt their self-efficacy was enhanced and felt more empowered to ask about sex and sexual problems to others such as friends, researchers and teachers. Finally, participants stated that they felt more confident to share their knowledge with friends in school and to be a liaison between friends who needed help with sexual risk problems and teachers in school based on lessons learned from the programme.

> 'I have learned and became aware of the negative consequences of sex at a younger age'.
>
> ST2
>
> 'I learned more about risk sexual behaviors, and this made me to be thoughtful about not getting pregnant while I am a school-age girl'.
>
> ST10
>
> 'I felt more confident and believe that I can be a guide to my friends at preventing teenage pregnancy'.
>
> ST7
>
> 'This program enhanced my existing knowledge from my sex education classes to a higher level'.
>
> ST5

2. Change in attitudes towards pregnant girls

Participants reported they changed their attitudes towards pregnant girls from seeing them as bad girls who

Table 4: *Post hoc* analysis of repeated measure ANOVA comparing the Teen-Strong questionnaire (TSQ) scores between different time points

Time	Experimental group ($n = 26$)				Control group ($n = 40$)				Difference in difference between experimental and control over time (d)	
	Mean (SD)	Mean difference (SE)	t-test (p-value)	Cohen's d Effect size	Mean (SD)	Mean difference (SE)	t-test (p-value)	Cohen's d Effect size	d (SE)	t-test (p-value)
T1: Before Teen-Strong	6.81 (3.72)				7.25 (4.74)					
vs.		8.77 (1.07)	8.19 (0.0000)			3.18 (0.86)	3.68 (0.0000)	0.69	5.59 (1.38)	4.07 (0.0000)
T2: Immediately after Teen-Strong	15.58 (2.02)			2.93	10.43 (4.53)					
T1: Before Teen-Strong	6.81 (3.72)				7.25 (4.74)					
vs.		7.85 (1.07)	7.33 (0.0000)	2.30		4.53 (0.86)	5.24 (0.0000)	1.81	3.32 (1.38)	2.42 (0.017)
T3: after 1 month Teen-Strong	14.65(3.07)				11.78 (3.56)					

SD: standard deviation; SE: standard error.

disappointed and embarrassed their families to being friends who needed help. Some participants reported that they changed their opinions about the cause of teenage pregnancy from a strong desire for sex to a lack of skills and knowledge to refuse and avoid sex. Participants stated that the programme helped them understand that a girl who gets pregnant should not be blamed, rather should be supported and helped.

Before participating in this programme:

> 'I felt pity for parents of school-age girls who get pregnant. These girls need to repent for their mistakes'.
>
> ST5
>
> 'She has promiscuous behavior to the extent that she does not know who the father of her unborn child is'.
>
> ST18
>
> 'We warned her (not to do that), but she didn't listen'.
>
> ST12

After finishing the programme:

> 'I felt sorry for school-age girls who get pregnant. I want to support them rather than judging them'.
>
> ST10
>
> '(We) should give her the opportunity to explain everything to their parents, including us. (We) can help them as a counselor'.
>
> ST20

DISCUSSION

In this study, we found that the Teen-Strong programme, which was developed by combining the concept of WHO's life skills learning programme and the standard sexual education curriculum, could enhance knowledge and decision-making skills for preventing sexual risk behaviours and teenage pregnancy in Thai adolescents if it is added to the standard sexual education curriculum.

This study revealed that adolescents who completed the Teen-Strong programme in addition to the standard sexual education curriculum had higher TSQ scores immediately after receiving the programme indicating higher knowledge and better decision-making skills for preventing sexual risk behaviours. In addition, 1 month after taking the programme, adolescents still had memorized and recalled the lessons learned and achieved significant higher TSQ score. These findings support the idea that using a participatory learning with variety

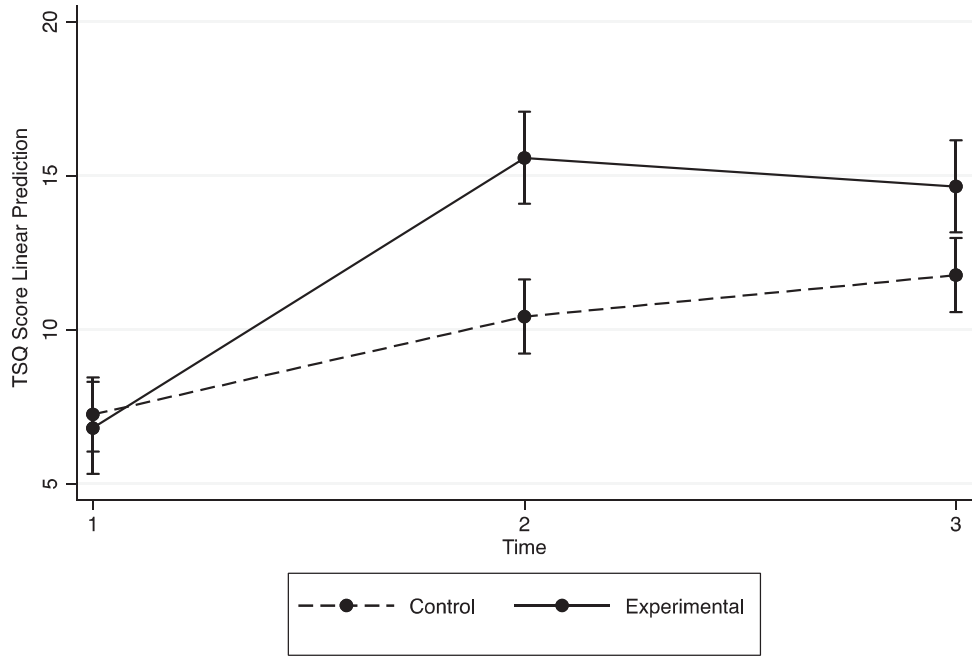

Fig. 2: Teen-Strong questionnaire (TSQ) score in experimental and control group across time.

of learning methods such as working as group, brainstorm, games and role plays as guided by the learning model of WHO's life skills programme may increase knowledge and decision-making skills in preventing sexual risk behaviours and teenage pregnancy. Our findings are similar to the findings from previous studies. A study from South Korea (Lee and Lee, 2019) applied eight-session learner-centred principles among 68 elementary grade students and showed that sexuality knowledge and interpersonal skills of adolescents improved after than before taking the programme, although the improvement was not statistically significant. Similarly, a meta-analysis (Sun *et al.*, 2018) of 15 studies from western countries reported that majority of the articles found improvements in sexual health knowledge (13 of 14) and attitudes (11 of 15) after intervention indicating that sexual education with participatory learning could enhance knowledge and attitudes at preventing sexual risk behaviours than traditional classroom teaching.

Similar to the experimental group, the findings within the control group showed that adolescents who received only the standard sexual education curriculum from school also had higher TSQ scores at both T2 and T3 compared with T1; however, the magnitude of increase in TSQ score in the control group were lesser than the experimental group. It is quite likely that the increase in TSQ scores at both T2 and T3 in the control group could be due to the exposure to the usual standard sexual education curriculum in their classes. It is likely that the control group may have learnt lessons in school which helped them to gain knowledge at preventing risky sexual behaviours. Furthermore, they also may gain knowledge and skills from other factors such as medias and peers who were involved in the experimental group, specifically at T3. However, the change observed in the control group may not be enough to prevent risky sexual behaviours because teenage pregnancy in Thailand continued to increase over the past years (Sukrat *et al.*, 2020), suggesting that additional interventions, such as the Teen-Strong programme, are needed to slow the rate of teenage pregnancy in Thailand.

Furthermore, this study revealed adolescents' attitude, self-awareness and empathy towards themselves and peers about risky sexual behaviours and teenage pregnancy have been changed in a positive way after taking this programme. The two themes from the open-ended questionnaire asked at T2 to the experimental group revealed enhanced knowledge and self-efficacy to prevent sexual risk problems and positive attitude change towards pregnant adolescents. Most female and male participants reported that they were happy working with other peers and the programme activities were fun. These results are supported by previous studies and encouraging adolescents to have more open discussion and freedom to express opinions and peer-to-peer

Table 5: Tukey's HSD *post hoc* tests of mixed design ANOVA comparing Teen-Strong questionnaire (TSQ) scores between experimental and control groups

Time	Group	Mean (SD)	Mean difference (SE)	t-test (*p*-value)	Cohen's d Effect size
At T1: before Teen-Strong	Experimental group	6.81 (3.72)	–0.44 (0.97)	–0.45 (0.65)	0.10
	Control group	7.25 (4.74)			
At T2: immediately after Teen-Strong	Experimental group	15.58 (2.02)	5.15 (0.97)	5.30 (0.0000)	1.47
	Control group	10.43 (4.54)			
At T3: 1 month after Teen-Strong	Experimental group	14.65 (3.07)	2.89 (0.97)	2.96 (0.003)	0.86
	Control group	11.78 (3.56)			

SD: standard deviation; SE: standard error.
Experimental group $n = 26$, Control group $n = 40$.

discussion was effective in altering risk behaviours, attitudes and knowledge related to sexual risk behaviours (Ashdown *et al.*, 2015; Lee *et al.*, 2015). Although this programme was given over short period of time (only 3 days), it changed participants view about young girls who get pregnant from 'bad girls' to 'girls who need help'.

Strengths and weakness of the study

Major strength of this study is the development and implementation of a new Teen-Strong programme, which was developed by combining two different programmes: the participatory learning from WHO's life skills programme and the standard sexual health education curriculum of the Thai Ministry of Education. The process of developing the Teen-Strong programme was sensitive to the Thai culture and adolescents' learning ability. This process was facilitated by inviting experts who work with the promotion of adolescent's health (e.g. nurses) and experts who work with curriculum development (e.g. professors and teachers) to refine the programme. The content of the Teen-Strong programme can go along with the lessons of the standard sexual education curriculum, and teachers can implement it during their class teaching.

Our study has some limitations. First, our study outcome was cognitive change (i.e. change in adolescent's knowledge and decision-making skills regarding risk sexual behaviours) 1 month after the programme. Cognitive changes may not necessarily lead to behavioural changes. Additionally, change needs to last longer than 1 month to be effective at reducing risk sexual behaviours. Future study should investigate the effectiveness of the Teen-Strong programme using longer follow-up time and assessing adolescent's behavioural changes. Second, we could not prevent the experimental group from sharing the content of the Teen-Strong programme with the control group at T3, and this might have underestimated the difference between the two groups about their knowledge and decision-making skills in preventing risky sexual behaviours and teenage pregnancy as time passes. Furthermore, the experimental group experienced both the Teen-Strong programme and the standard sexual education curriculum. Thus, we cannot tease out if the cognitive improvements were due to more time in a sexual education programme or the specific components of the Teen-Strong programme. Finally, since this was a small study and implemented in six schools, this study's findings may not be widely generalizable. The Teen-Strong programme should be replicated using a larger sample size and a randomized control trial design to better understand the programme's effect on preventing sexual risk behaviours and teenage pregnancy among Thai adolescents.

Recommendations

This study demonstrated that the Teen-Strong programme, developed by combining participatory and active learning based on WHO's life skills programme, when added to the standard sexual education curriculum could boost adolescents' knowledge, decision making skills and attitude regarding sexual risk behaviours and teenage pregnancy more than only the traditional school's sexual education curriculum. The participatory and active learning methods such as games, brainstorms and role play and participatory learning could encourage and stimulate adolescents to participating, sharing and learning from peers. Thus, health care providers, teachers and researchers who engage in adolescent's sexual health can add the Teen-Strong programme with the traditional sexual education curriculum to enhance knowledge and decision skills of Thai adolescents. This programme can be implemented within Thai secondary schools because it was uniquely adapted to the Thai culture, adolescents' capacity, and core content that teachers are familiar with and understand. However, teachers need to get trained with the Teen-Strong programme techniques so that they can be competent to teach and lead the activities of this programme in their schools.

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CONFLICT OF INTEREST STATEMENT

The authors declare no potential conflicts of interest.

ETHICAL APPROVAL

This study was approved by the Institutional Review Board from the Faculty of Nursing, Prince of Songkla University in Thailand (No. MOE.604.2/155). Permission was obtained from each school principal where the students were recruited. We sent informed consent forms to the parents of students who met the inclusion criteria. Then, the student's parent and the student signed the consent form before participation in the study.

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