Effectiveness of a Sexual Risk Behaviors Prevention Program among Early Adolescent Thai Muslim Girls: A Quasi-Experimental Study

Sirakhrin Pichaisongkram, Puangpaka Kongvattananon, Bih-Ching Shu, Chintana Wacharasin*

Abstract: Sexual risk behaviors among Muslim girls differ from those of others due to their unique cultural and lifestyle factors, including early marriages, high rates of young motherhood, some sexually transmitted diseases, and limited educational opportunities. This quasi-experimental study aimed to test the effectiveness of the Sexual Risk Behaviors Prevention Program on self-efficacy for safe sexual behaviors and sexually intimate behaviors in early adolescent Thai Muslim girls. Forty-eight girls in grades 4-6 were recruited, and their mothers or legal guardians were involved in the program. The participants were randomly assigned to an experimental group (n = 23) receiving the program and a control group (n = 24) receiving only routine sex education. Data were collected from June to November 2023 using the Self-efficacy for Safe Sexual Behaviors Questionnaire and the Adolescent Sexual Activity Index. Data were analyzed using independent t-test and one-way repeated measures ANOVA.

The results indicated that the mean self-efficacy score in the experimental group was higher than that of the control group at immediate, 12-, and 24-week follow-ups. Sexually intimate behaviors in the experimental group were lower than in the control group at 12 and 24 weeks. The results indicated that this program is useful for preventing sexual risk behaviors in early adolescent Thai Muslim girls. It could be applied to encourage Thai Muslim girls to be safe from sexual risk behaviors. However, further testing in various settings with other samples is needed before it can be widely used.

Keywords: Early adolescent, Muslim girls, Safe sex, Self-efficacy, Sexual behavior prevention, Sexually intimate behaviors, Sexual risk behaviors

Received 23 August 2024; Revised 5 November 2024; Accepted 7 November 2024

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https://doi.org/ 10.60099/prijnr.2025.27072

Introduction

Thai Muslim adolescents in Southern Thailand are at risk of sexual risk behaviors. Islam enforces strict religious practices to prevent premarital sex, including the teaching of wearing the Hijab, prohibiting relationships with boyfriends before marriage, and Muslim family law allowing parents to force girls to marry earlier.[1] Muslim girls may still face challenges in adhering to these norms.[1] However, evidence of sexual risk behaviors (SRBs) in Muslim adolescents aged between 14-19 years shows that 9% are sexually experienced, with many not using condoms (41.3%) or considering taking contraceptive pills (71.4%), with 54% having had sexual intercourse multiple times, while 17.5% have contracted sexually transmitted infections (STIs) and 14.3% have experienced multiple pregnancies.[2] This means many adolescent Thai Muslim girls were forced to marry, which affects young mothers being less likely to continue their studies.[3] One factor contributing to SRBs among Thai Muslim girls is low self-efficacy. Within Muslim culture, the traditional acceptance of male superiority and authority over women often limits the empowerment of females; therefore, Muslim females may experience diminished personal power and a reduced sense of self-efficacy.[4]

Sexual risk behaviors among Thai Muslim girls are strongly influenced by religious beliefs and culture,[4,5] which differ from those of Thai girls in general. For instance, most existing programs for adolescent girls focus on promoting safe sex, while premarital sex is prohibited in Islam. A new law permits abortion for young mothers under 12 weeks of gestation, but abortion is forbidden in Muslim culture,[3,6] making existing interventions often ineffective in addressing this issue. Various interventions have been launched to reduce SRBs in Thai girls. These include school-based programs aimed at preventing unintended pregnancies in junior high school,[7] using social media to change attitudes towards contraceptive use, family-based interventions to improve communication, enhancing social and emotional learning in high school students,[8] using computer-based to prevent SRBs in early adolescent Thai girls[9] and sexual education in elementary school.[9,10] Moreover, the Thai government launched the Act for Prevention and Solution of Adolescent Pregnancy (B.E. 2559/2016), which promotes sex education in primary and secondary schools as well as vocational schools. The Program for Appropriate Technology in Health (PATH) has been provided in some schools since 2009, focusing on preventing teenage pregnancies, reducing STIs, and promoting youth development. Despite a decrease in the proportion of adolescent pregnancies over the past five years, there has been a significant rise in STIs among teenage females. The Thai government has also initiated prevention programs targeting general Thai girls, mostly with high school students. However, these programs do not align with Muslim culture and religious beliefs, as they typically promote safe sex activities, while premarital sex is prohibited in Islam.

Therefore, existing programs are not compatible with Muslim culture. The Sexual Risk Behavior Prevention (SRBP) program was developed by the researcher to address the specific needs of Thai Muslim girls. This study aimed to determine whether the SRBP program could increase self-efficacy for safe sexual behaviors and prevent sexually intimate behaviors in early adolescent Thai Muslim girls.

Literature Review and Conceptual Framework

The SRBP program integrates the self-efficacy theory and the needs of participants along with knowledge, life skills concepts, self-esteem, self-awareness, and self-control. Self-efficacy is the confidence a person has in their ability to manage and shape the situations that impact their life effectively,[11] including an individual's belief in their capacity to adopt behaviors that support sexual health and safety.[11] Self-efficacy is vital in reducing sexual risk behaviors in women.[12] It is crucial in decision-making and behavior in sexual situations,[12]

and is linked to confidence in knowledge and skills.[13,14] Self-efficacy for safe sexual behaviors develops through various factors, including comprehensive sex education,[13] access to accurate information,[10] supportive social environments,[15] communication, and negotiation skills.[13,14] It is a crucial component of decision-making and behavior in sexual situations.[14] High sexual self-efficacy is linked to a greater likelihood of practicing safe sex among adolescents,[11] believing in their actions and choices,[16] understanding contraception, preventing STIs,[9] developing communication skills for negotiating safer sex,[14] and consistent condom use.[15] Such efficacy leads to them feeling empowered to take control of their sexual health,[16] navigating challenges like social pressures,[11] communicating boundaries, and accessing resources such as contraceptives or STI testing.[11] Adolescents with high self-efficacy are more likely to maintain safe practices even when faced with obstacles or in environments where safe sex is not the norm.[17] This belief is a crucial motivator for well-being and personal achievement.[18] Self-efficacy is developed through four sources: mastery experiences (gaining confidence by overcoming challenges), vicarious experiences (learning by observing others), social persuasion (encouragement from others), and emotional states (affecting confidence in avoiding SRBs).[19]

Self-esteem and self-awareness serve as protective factors against risky behaviors in adolescent females.[20] Self-esteem refers to having a positive and realistic view of oneself, which involves evaluating one's worth.[21] Self-esteem is recognized to affect sexual risk behaviors in adolescent females; low self-esteem can lead to less confidence in refusing sexual advances and a reduced ability to say no.[14] Low self-esteem often results in doubts about one's value, making individuals more susceptible to pressure and risky sexual behaviors.[21] Conversely, adolescents with high self-esteem typically have better confidence in refusing unwanted sexual advances and are less prone to participating in risky behaviors.[21] High self-esteem is associated with greater self-confidence in setting boundaries and communicating effectively.[21] Additionally, developing self-awareness helps individuals recognize and manage challenging situations, such as high pressure from peers.[14] Increased self-awareness also aids adolescents in understanding others and developing empathy, which contributes to a better understanding of their own emotions.[22] Self-awareness helps establish effective management of negative emotions.[23] Knowledge of religious principles along with physical and psychological changes during the early adolescence stage can predict SRBs in Muslim adolescents, as well as sexual knowledge of parents.[5] Adolescent Muslims and their mothers have limited knowledge about sexually transmitted infections,[4] contraceptive use,[2] and reproductive health including technology,[4] and acceptance of premarital sex in the new generation Muslim adolescents.[14]

Self-control is the capacity to consciously adjust one's responses, such as thoughts, feelings, impulses, and behaviors,[24] to align with personal standards.[9] Developing self-control helps individuals avoid impulsive reactions and behave in a manner that is appropriate for various situations.[14] It is closely related to premarital sexual behaviors in adolescents, as high sexual self-restraint[14] can influence their decisions and actions regarding sexual activity[13,14] such as high self-efficacy for refusal of sexual needs and no power to say no.[14]

Life skills are capabilities that enable individuals to adapt and respond positively to the challenges and demands of daily life.[14] Life skills encompass cognitive thinking,[14] creative thinking, critical thinking, and problem-solving.[23] Strong life skills enhance an individual's ability to assess risks,[23] capability to deal with peer sexual harassment,[25] thinking creatively to problem-solving,[24] and develop self-awareness.[24] This helps them become more independent and capable of making well-informed decisions.[14] Higher life skills increase the effective management of negative emotions,[24] higher refusal skills and self-control.[14] Cognitive skills, such as attitude toward condom use and unsafe sex behaviors, impact one's self-efficacy and precautions.[24]

Higher cognitive skills are also associated with greater self-efficacy,[26] and a stronger ability to refuse unprotected sex and avoid risky situations.[26]

The existing program designed to prevent sexual risk behaviors in early adolescents primarily focuses on providing sex education and assessing life skills.[9] In junior and high school, a previous intervention aimed to reduce sexual risk behaviors and prevent unintended pregnancy by evaluating attitudes, normative intentions, and the quality of sexual communication between parents and their daughters.[8] The SRBP is distinct from previous interventions aimed at preventing sexual risk behavior among young adolescents. It focuses on increasing the self-efficacy of early adolescent Muslim girls through analytical thinking and problem-solving skills, helping them handle challenges effectively, and involving parents to participate. In addition, the program incorporates religious and cultural beliefs. This approach aimed to foster awareness and appreciation of how religious principles can prevent sexual risk behaviors among Muslim adolescents. The arrangement of the program objective and activities was validated by the same three experts who validated the self-efficacy questionnaire and revised as recommended before implementation.

Hypotheses

1. After receiving the SRBP program, the mean scores on self-efficacy for safe sexual behaviors in the experimental group at T1, T2, T3, and T4 would be significantly higher than baseline and then that of the control group.

2. After receiving the SRBP program, the mean score on sexually intimate behaviors in the experimental group at T1, T2, T3, and T4 would be significantly lower than the baseline and then that of the control group.

Methods

Design: This study employed a quasi-experimental design featuring a two-group, pre-posttest approach with a nonrandom control group. It included immediate post-tests and follow-ups at 12 and 24 weeks. Our reporting here followed the TREND statement, which aims to enhance the quality of reporting for non-randomized evaluations of behavioral and public health interventions.

Study Setting: This study was conducted at an elementary school using an Islamic education curriculum in the southern region of Thailand.

Sample: The participants were Thai Muslim girls. The sample size was calculated using G*Power version 3.1.9.7, with a power of .80 and 95% confidence level. The effect size from a previous study by LeCroy et al.[27] was 0.23. The required sample size was 20 participants per group, with an additional 20% added to account for dropouts,[28] resulting in a total recruitment of 48 participants, with 24 in each group. The inclusion criteria were: Muslim girls aged 10-13 years studying in grades 4-6, able to communicate in Thai, and with no impairment of cognitive function, and 4) their mothers or legal guardians who were to participate in the intervention period. Exclusion criteria were those who could not participate in all 11 program strategies.

Sampling: First, simple random sampling was used to select one school from ten elementary schools for the study. The stratified random sampling technique was then applied to select participants from each grade 4 to 6 classroom, using a table of random numbers to randomly assign the 48 participants into the experimental and control groups in **Figure 1**. To prevent contamination between the experimental group and the control group, the primary investigator (PI) made an agreement with the participants in the experimental group regarding the disclosure of information about their participation in the program so that it would not be disclosed to others.

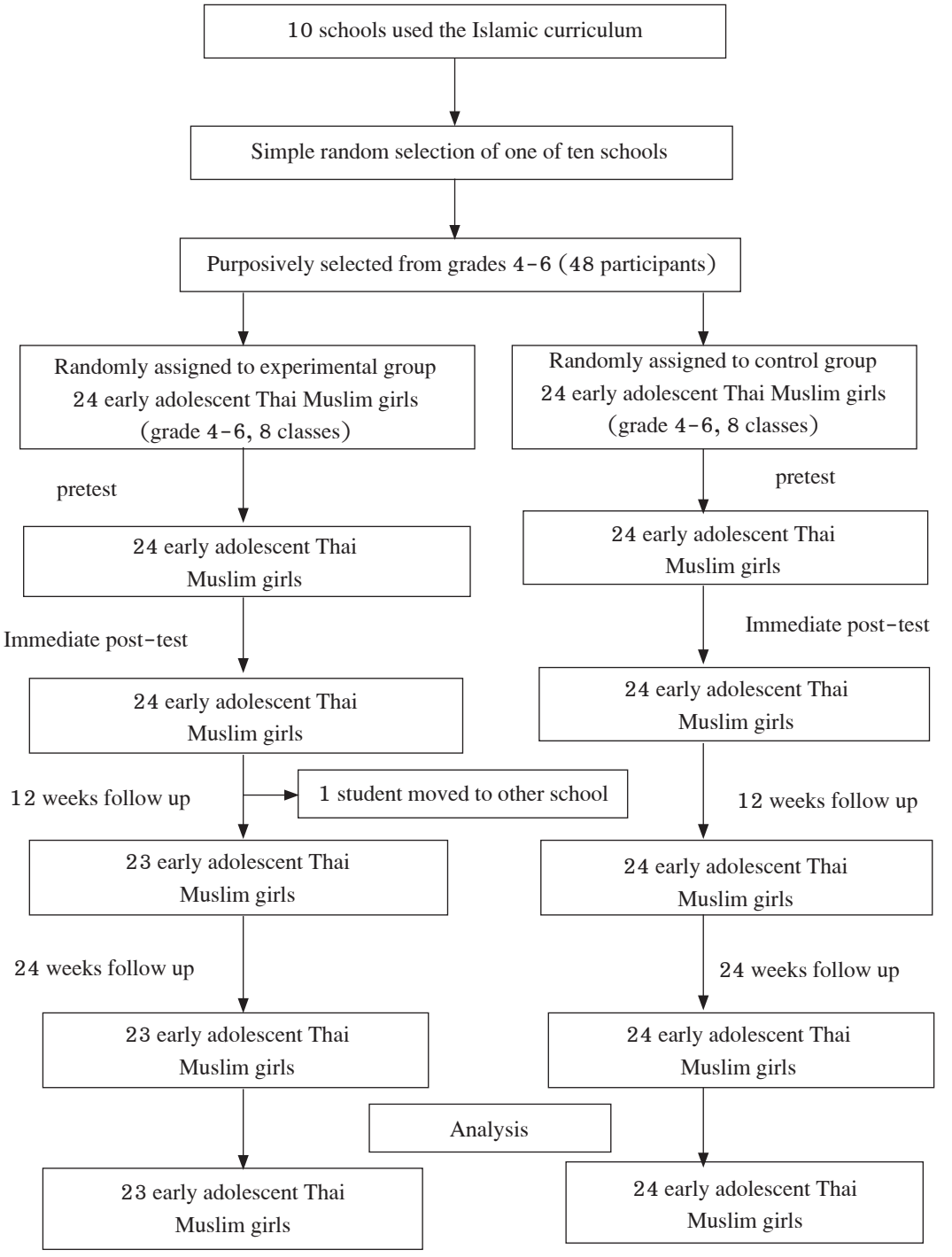

Figure 1. Flow diagram of the total participants in the study

Ethical Considerations: This study received approval from the Ethics Review Sub-Committee for Research Involving Human Subjects at Thammasat University, Thailand (COA No.139/2564; 024/2565). All participants were briefed on the study's objectives, and enrollment was contingent upon their willingness to participate before obtaining signatures from their parents or legal guardians on the informed consent forms. The girls were required to sign assent forms and complete the consent forms to be signed by their parents or legal guardians. All the participants' information was kept confidential and securely stored. This participation did not impact their grades.

Research Instruments: This study utilized three questionnaires to collect data.

A Socio-demographic Questionnaire included age, education level, menstruation, history of illness, occupation, and family leader.

The Self-efficacy for Safe Sexual Behavior (SE-SSB) *Questionnaire* was modified from the Teen Attitude Pregnancy Scale (TAPS) developed by Somer et al.[29] It contains four items, for example, resisting sex if contraceptives are unavailable, and using birth control when having sex. Each item is scored on a 5-point Likert-type scale (1 = very unsure, 2 = somewhat unsure, 3 = undecided, 4 = somewhat sure, and 5 = very sure). The total scores range from 4 to 20, with higher scores reflecting greater self-efficacy for safe sexual behaviors. The SE-SSB was back-translated from English to Thai with permission from the developer and validated by three experts, followed by a pilot test with 30 early adolescent Thai Muslim girls. The validity was 0.86, the Cronbach's alpha coefficient was 0.82, and 0.85 was reported for the main study.

The Adolescent Sexual Activity Index (ASAI) developed by Hansen et al.[30] is employed to evaluate sexually intimate behaviors over the past 30 days. It contains ten items, and the participants are asked about sexually intimate behaviors. Items ranging from spending time alone with a boy to engaging in sexual intercourse were scored as either 0 (no) or 1 (yes). Examples are hugging, holding hands, and spending time alone with men. The total scores ranged from 0 to 12; higher scores indicate higher sexual risk behaviors. This instrument was back-translated from English to Thai with permission from the developers, validated by three experts, and pre-tested on 30 early adolescent Thai Muslim girls. The validity was 0.90, with a reliability of 0.79 using the Kuder-Richardson-20 method, and 0.82 was reported for the main study.

The Sexual Risk Behaviors Preventing (SRBP) Program

This SRBP was developed from a literature review based on the self-efficacy theory, life skills, self-esteem, self-awareness, self-control concepts, and the needs of the participants. The SRBP program integrates the findings from a situational analysis. The PI conducted in-depth interviews and focus group discussions with 25 adolescent Thai Muslim females, their mothers or legal guardians, eight teachers, and eight Thai Muslim boys. Data indicated that Thai Muslim girls required skills in self-control and emotional control, including understanding how to love, refuse, and restrain, as well as knowledge of religious principles, biology, and life skills. These findings were integrated into the SRBP program, which is composed of 11 strategies: 1) increase knowledge about teen pregnancy, 2) increase knowledge about STIs, 3) increase knowledge about body changes and life skill knowledge, 4) encourage understanding of self and others and increase positive thinking 5) encourage self-esteem and self-worth, 6) encourage understanding the emotions of self and others, 7) encourage self-control and emotional control, 8) increase knowledge about religious principles, 9) encourage creative thinking and problem-solving, 10) encourage analyzing ability and appropriate decision-making, and 11) increasing analytic skills.

The SRBP program is designed to improve SE-SSB by empowering Thai Muslim girls to have the power to take care of themselves. The program objective and activities were validated by the same three experts who validated the SE-SSB and the ASAI before

implementation. The main goal of the SRBP program was to enhance girls' SE-SSB. It was a four-week program with 2 to 3 sessions per week, 45-60 minutes per session in the morning and afternoon sessions at the school meeting room. The mothers or legal guardians were involved in sessions 1-3 of the program. The details of the components and implementations are shown in **Appendix, Table A1.**

Routine Sex Education

The control group received routine sex education from an Islamic study curriculum incorporating both the national Thai curriculum and specific Islamic studies. Islamic studies comprise Quranic studies of Figh, the basic principle of Islamic law and daily rituals; Aqidah, fundamental beliefs in Islam, including the articles of faith and core theological concepts; Sirah, life and teachings of the Prophet Muhammad, which focus on the morals and ethical lessons; Arabic language: basics of the Arabic language, particularly for understanding religious texts; moral and ethical education: the curriculum emphasizes the development of good characteristics and moral and ethical education, as well as Muslim culture.

Data Collection: Data were collected from June to November 2023. After the IRB approval, the SRBP program was implemented by the PI, who met with the school director and homeroom teachers to request permission for data collection. The participants were randomly assigned to the experimental and control groups. This study utilized a single-blind method, where both the participants were unaware of the group assignments. Before data collection, the parents or legal guardians were informed and provided their consent by signing, and then the participants were informed and provided an assent form. The PI measured SE-SSB and sexually intimate behaviors at baseline and collected data in the control group before starting the intervention. Then, the SRBP program was implemented for four weeks through data collection. The PI conducted sessions over 3 hours on weekends in a meeting room. The experimental group participated in the SRBP program for 4 weeks. Meanwhile, both the experimental and the control groups received sex education from the Islamic curriculum. The evaluation was conducted through a questionnaire administered four times to both groups. Two variables, SE-SSB and sexually intimate behaviors, were measured before the program, immediately, 12, and 24 weeks after the program.

Data Analysis: This was conducted using the Statistical Package for the Social Sciences (Version 26.0). Descriptive statistics were employed to outline the socio-demographic characteristics and backgrounds of the participants. Independent t-tests and chi-square statistical analyses were used to compare the differences between the two groups at baseline, and Fisher's exact test was employed. An independent t-test was employed to assess the differences in total SE-SSB scores and scores for sexually intimate behaviors between the groups, while a one-way repeated measures ANOVA was used to examine the differences within groups across measurement intervals. Shapiro-Wilk statistical test and Mauchly's Test of Sphericity indicated that the dependent variables were normal distribution, and the variance of dependent variables was equal.

Results

Participant characteristics

As shown in **Table 1**, the mean age of the participants in the experimental group was 11.69 years and 11.21 years in the control group. They studied in grades 4 to 6; the mean GPA was 3.21 in the experimental group and 3.33 in the control group. Most participants had not yet started menstruating, and only 8.30% reported a history of illness. The caregivers' occupations for both groups were private sector; the mean family income was 8,875 THB

Table 1. Socio-demographic characteristics of participants

Socio-demographic characteristics	Experimental group (n = 24)	Control group (n = 24)	Statistical value	p-value
Age (years)			6.27[a]	0.39
Mean (SD)	11.69 (0.76)	11.21 (1.10)		
Min-max	10-13	10-13		
Education				
Grade 4	6 (25.00)	6 (25.00)	3.39[a]	0.50
Grade 5	9 (37.50)	9 (37.50)		
Grade 6	9 (37.50)	9 (37.50)		
Grade point average (GPA)				
Mean (SD)	3.21 (0.28)	3.33 (0.29)	-1.53[c]	0.07
Min-max	2.55-3.70	3.00-3.86		
Menstruation				0.18[b]
Yes	8 (33.30)	6 (25.00)	-	
No	16 (66.70)	18 (75.00)		
History of illness				
Yes	2 (8.30)	-	-	0.18[b]
No	22 (91.70)	24 (100)		
Occupation of family leader				
Government officer	1 (4.24)	-	27.30[a]	0.07
Private-sector employee	19 (79.14)	15 (62.50)		
Self-employed	2 (8.31)	2 (8.35)		
Fishing	2 (8.31)	2 (8.35)		
Farming	-	5 (20.80)		
Family income				
Mean (SD)	8,875 (3284.52) THB 261.28 (97.42) USD	8,925 (3,206.68) THB 262.75 (95.12) USD	-0.05[c]	0.48
Min-max	3,000-15,000 THB 88.99-444.93 USD	3,500-5,000 THB 103.82-148.31 USD		

Note. [a] = chi-square, [b] = Fisher's exact test, [c] = t-test

(261.28 USD) in the experimental group and 8,925 THB (262.75 USD) in the control group. The two groups had no statistically significant differences in the general socio-demographic characteristics. Moreover, there were no significant differences in SE-SSB scores and scores for sexually intimate behaviors between the groups.

Effects of the SRBP program

Comparison of the mean scores for SE-SSB before and after intervention at immediate, 12, and 24 weeks

As shown in **Table 2**, the participants in the experimental group had a higher mean score on SE-SSB compared to those in the control group. The participants in the experimental group had higher mean SE-SSB scores than before starting the program and significantly higher than before receiving the program ($F = 424.64$, $p < 0.001$), as shown in **Table 4**. The experimental group exhibited higher mean scores at Times 2, 3, and 4 compared to Time 1, with significance at each measurement point (**Table 2**). **Table 3** presents the one-way repeated measures ANOVA and post-hoc analysis using the Bonferroni technique to compare the multiple mean scores of SE-SSB across different

time points. The experimental group shows an increasing trend in **Figure 2** and had higher mean scores at Times 3 and 4 compared to Time 1, with significance at each measurement point. A one-way repeated measures ANOVA, supplemented by post-hoc analysis using the Bonferroni method, was employed to compare the mean SE-SSB scores at various time points. **Table 4** demonstrates that participants in the experimental group had higher mean scores for SE-SSB compared to the control group. The interaction effect (time*group) showed a statistically significant difference at 12 and 24 weeks ($F = 19.94$, $p < 0.05$). Moreover, **Table 2** demonstrates that participants in the experimental group had higher mean scores for SE-SSB compared to their scores before starting the program. The effect size of the program on the SE-SSB variable was 0.21.

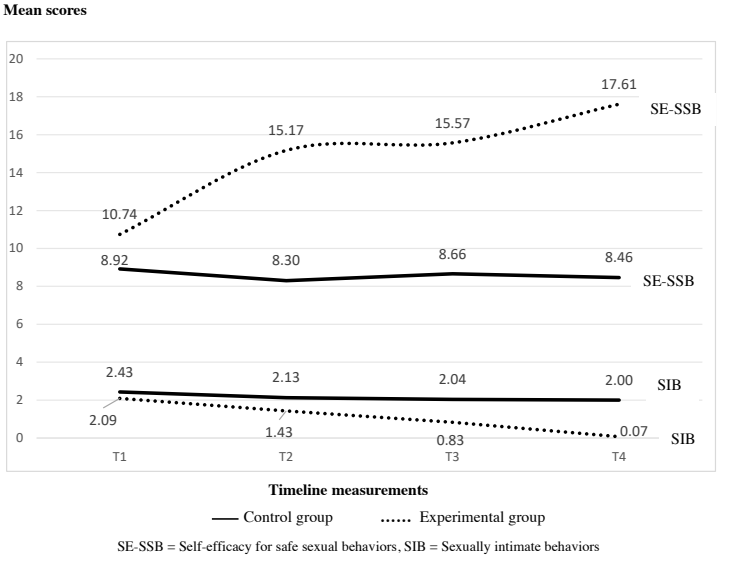

Figure 2. Timeline measurements of outcomes

Table 2. Comparison of the mean SE-SSB scores and sexually intimate behaviors scores before and after intervention at each time point

Outcome variables	Experimental group (n = 23) M (SD)	Control group (n = 24) M (SD)	SE	p-value
Self-efficacy for safe sexual behavior scores				
Time 1 (Baseline)	10.74 (3.16)	8.92 (3.03)	0.49	0.09
Time 2 (Immediately)	15.17 (7.41)	8.30 (3.27)	1.79	0.03
Time 3 (12 weeks)	15.57 (7.66)	8.61 (3.59)	1.72	0.01
Time 4 (24 weeks)	17.61 (5.09)	8.46 (3.64)	1.13	< 0.001
Sexually intimate behavior scores				
Time 1 (Baseline)	2.09 (1.24)	2.43 (1.62)	0.31	1.00
Time 2 (Immediately)	1.43 (.95)	2.13 (1.10)	0.28	0.64
Time 3 (12 weeks)	0.83 (0.77)	2.04 (0.97)	0.31	0.02
Time 4 (24 weeks)	0.07 (0.47)	2.00 (0.95)	0.21	< 0.001

Table 3. Pairwise comparisons using Bonferroni of the mean difference in total scores between each pair of time differences in the experimental and control groups (n = 23, 24)

Variable	Time	Mean difference	Std error	p-value
SE-SSB scores	Experimental group			
	T1 vs T2	4.44	1.47	0.180
	T1 vs T3	4.83	1.05	0.004
	T1 vs T4	6.87	1.28	< 0.001
	Control group			
	T1 vs T2	0.78	0.40	1.00
	T1 vs T3	0.48	0.44	1.00
	T1 vs T4	0.48	0.46	1.00
Sexually intimate behaviors scores	Experimental group			
	T1 vs T2	0.65	0.33	1.00
	T1 vs T3	1.26	0.33	0.02
	T1 vs T4	1.39	0.27	0.001
	Control group			
	T1 vs T2	0.35	0.31	1.00
	T1 vs T3	0.04	0.22	1.00
	T1 vs T4	0.09	0.33	1.00

Note. SE-SSB = self-efficacy for safe sexual behavior

Table 4. One-way repeated measures ANOVA of SE-SSB scores and sexually intimate behaviors scores

Source of variance	Type III sum of square	df	Mean square	F	p-value
SE-SSB Scores					
Within group					
Time	2307.21	2.45	942.54	17.04	< 0.001
Group*Time	833.86	1	833.86	19.94	< 0.001
Error	2978.91	53.85	55.31		
Between groups					
Group	25239.27	1	25239.27	424.64	< 0.001
Error	1307.61	22	59.44		
Sexually intimate behavior Scores					
Within group					
Time	67.28	3.43	19.61	9.54	< 0.001
Group*Time	28.23	1	28.23	18.57	< 0.001
Error	155.22	75.49	2.06		
Between groups					
Group	536.85	1	535.85	285.23	< 0.001
Error	46.65	22	2.08		

Note. SE-SSB = self-efficacy for safe sexual behavior

Comparison of the mean scores for sexually intimate behaviors before and after the intervention at each time point

As shown in **Table 2**, the participants in the experimental group had a lower mean score for sexually intimate behaviors compared to the participants in the control group. The participants in the experimental group had lower mean sexually intimate behavior scores than before starting the program and significantly lower than before receiving the program ($F = 285.23$, $p < 0.001$) (**Table 4**). The experimental group showed a decreasing trend in **Figure 2** and recorded lower mean scores at Times 2, 3, and 4 compared to Time 1, with significance at each measurement point (**Table 3**). **Table 3** presents the one-way repeated measures ANOVA and post-hoc analysis utilizing the Bonferroni technique to compare the multiple mean scores for sexually intimate behaviors across different time points. As indicated in **Table 2**, the participants in the experimental group had a lower mean score for sexually intimate behaviors compared to those in the control group, and their scores were significantly lower than before receiving the program. The participants in the experimental group had lower mean scores for sexually intimate behaviors compared to their scores before starting the program. Additionally, the experimental group had lower mean scores at Times 3 and 4 than at Time 1, with significance at each measurement. A one-way repeated measures ANOVA, accompanied by post-hoc analysis using the Bonferroni method, was utilized to compare the average sexually intimate behaviors scores at various time points. As shown in **Table 2**, the mean of sexually intimate behaviors scores in the experimental group at Times 3 and 4 were lower than at Time 1.

The results indicated that the experimental group had lower mean scores at Times 3 and 4 than at Times 1 and 2, with significance at each measurement. The mean score for Time 3 was statistically and significantly different from Time 1, and Time 4 was statistically and significantly different from Time 1 (**Table 3**). **Table 4** indicates that participants in the experimental group had lower mean scores for sexually intimate behaviors compared to the control group. The interaction effect (time*group) showed a statistically significant difference at Time 3 (12 weeks) and Time 4 (24 weeks) ($F = 18.57$, $p < 0.05$). Moreover, **Table 2** indicates that participants in the experimental group had lower mean sexually intimate behaviors scores compared to before starting the program. The effect size of the program on self-efficacy for sexually intimate behaviors was 0.67.

Discussion

The findings of this study indicate that the SRBP program effectively enhances SE-SSB and decreases sexually intimate behaviors among early adolescent Thai Muslim girls. The program's key components consisted of practicing skills such as encouraging creative thinking and problem-solving, critical thinking, decision-making, self-control, emotional regulation, self-esteem building, and self-awareness raising, allowing individuals to address everyday life's demands and challenges effectively. The program also focuses on clarifying and analyzing values, promoting communication skills such as active listening, fostering empathy, practicing assertiveness, negotiation, and managing emotions and stress.

Furthermore, this program promotes sexual education and knowledge of Islamic principles. It incorporates various activities, such as animations, videos, lesson plans, games, drawing, group discussions, and presentations. The expected outcomes include the prevention of sexual risk behaviors and an increase in positive attitudes towards puberty changes and condom use. Follow-up at 12 weeks suggests that these improvements align with findings from previous studies.[8] Enhancing knowledge about sexual education, puberty-related changes, teenage pregnancy, STIs, and life skills in Muslim girls and their mothers or guardians in three sessions of the program. In a Muslim

context, mothers play a primary role in educating their daughters about sexual issues.[31] Therefore, increasing the knowledge of Muslim mothers significantly contributes to the effectiveness of preventing sexual risk behaviors.[32] Furthermore, religious principles were established as part of the program. Previous studies found that increasing sexual education knowledge was associated with higher SE-SSB in adolescent females,[14] and life skills knowledge such as refusal skills, negotiating, emotional regulation, and self-control increase SE-SSB in adolescent females[33] and increased ability to ask partners to use a condom.[11,34] Knowledge is crucial for developing critical thinking, which helps adolescents choose accurate information and analyze it effectively. High critical thinking skills are associated with critically evaluating facts, choosing appropriate solutions, and increasing confidence.[34] This leads to greater independence in thinking and reduces dependence on others.[33] This finding is related to a study by Ferrand et al.,[33] which reported that increasing knowledge enhanced self-efficacy and assertiveness in adolescent females.

In elementary students, knowledge is a fundamental part of cognitive thinking. The situation analysis found that early adolescent Thai Muslim girls require evasion and survival skills, as well as propriety. Therefore, this developed program involves life skills competence and includes effective creative thinking, critical thinking, and problem-solving skills as an essential strategy for early adolescent girls. Life skills were practiced through group discussions, sharing experiences with peers, presentations, and reflection through drawing pictures, animation, short movies, and video clips. Our findings support those of Tesema et al.,[35] who described that developing life skills helps adolescents exercise more reason and intentionally make choices about sexuality, which will result in increased self-efficacy in sexual behaviors. Critical thinking is also related to emotional intelligence and creative thinking, especially in elementary students, which is further associated with a study by MacCann et al.,[36] finding that critical thinking enabled emotional control in elementary students. It can be concluded, therefore, that the program supports self-efficacy in adolescents.

In addition, this program also encouraged all participants to recognize their emotions and manage to control them through games, self-reflection, group discussion, and drawing activities. Working in groups allowed peer support, which can help normalize responsible sexual behavior and contribute to increased self-efficacy.[35] The effectiveness of self-regulation and emotional control have been shown in various studies, such as studies on reducing stress, which influences decision-making ability in problem-solving.[23] Self-regulation and emotional control also significantly impact self-efficacy for safer sexuality in adolescent females[35,38] Perceived behavior control was the strongest predictor of contraceptive use.[37] Emotional control in managing anxiety and fear is related to sexual health issues. For example, adolescents may experience anxiety about discussing safer sex with a partner, be afraid of contracting STIs, or be concerned about unintended pregnancy. Emotional control enables them to address these fears and anxieties more effectively, which boosts their self-efficacy in taking proactive measures to protect their sexual health. The SRBP program encouraged the participants to practice safe sex practices, which was related to a study by Kisaakye et al.,[11] who found that promoting safe sex practices can prevent new cases of HIV and other STIs. Self-efficacy in condom use refers to confidence or ability in condom use, such as in situations involving drunkenness and partner pressure.[39]

To summarize, the SRBP program is expected to prevent sexual risk behaviors in early adolescent Thai Muslim girls by increasing SE-SSB when engaging in sexual risk behaviors. On the one hand, it can be said that this program aims to increase SE-SSB in adolescent Thai Muslim girls by establishing self-esteem and confidence among the girls in confronting peer or partner pressure, promoting competency in problem-solving among Thai Muslim adolescent girls who are confronted with dangerous situations and faced with suffering the consequences of these situations.

Limitations

Early adolescent girls in elementary school might have limited cognitive abilities to grasp the complexity of sexual risks and their implications. It is important to communicate these concepts effectively without overwhelming them. In addition, this study was a short-term program that really needs longer-term follow-up to test its effectiveness.

Conclusion and Implications for Nursing Practice and Research

This study showed that an SRBP program increased SE-SSB and reduced sexually intimate behaviors among Thai Muslim adolescent girls. Thus, the SRBP program should be added to elementary schools' curricula in the context of Islamic healthcare providers who work closely with the community, such as community nurses, family nurses, or family health teams, who can use the SRBP program. However, special training on the following skills includes communicating with adolescents, building self-awareness and self-esteem, building cognitive skills, building critical thinking, and Islamic principles. Additionally, the follow-up of an effective program should extend over the long term, and the program should be tested among other participants and settings.

Acknowledgments

We express our sincere gratitude to all participants and also the Ministry of Higher Education, Science, Research and Innovation for the scholarship that funded this research.

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Appendix

Table A1. The SRBP program

Week/Strategy/Time	Objectives	Activities
Preparation: Week 1 Pre-test: 30 minutes	- To establish the study's purpose and significance during baseline measurements	Participants were introduced to the program; Baseline assessment of the independent variables
Week 1 **Strategy 1:** Increase Knowledge of Teenage Pregnancy (45-60 minutes)	- To promote awareness of teenage pregnancy - To establish analytical thinking concerning the causes of problems with guidance for prevention	Watching a short movie: "Teenage Pregnancy"; Discussion and analysis of the causes, risks, and effects of pregnancy during the school years; Presentation with pictures and sharing ideas; Reflect on the causes, impacts and prevention of teenage pregnancy
Strategy 2: Increase Knowledge of STIs (45-60 minutes)	- To increase knowledge and share experiences about STIs - To apply the knowledge in daily life	Watching the video clip: "Sexual Risk Behaviors"; Discuss, brainstorm, and answer questions, then place the answers in STI sheets; Playing the game "Who's Infected?" Reflection on how STIs are transmitted: having sex when you are not yet the right age.
Strategy 3: Increase Knowledge of Body Changes and Life Skills Knowledge (45-60 minutes)	- To establish a good attitude about biological changes - To increase knowledge about puberty changes and provide guidance on how to deal with them	Watching animation: "Teaching My Daughter"; Discuss changes during adolescence, including physiological, psychological, and socio-psychological effects; Sharing ideas by using puberty change cards
Week 2 **Strategy 4:** Encourage Understanding of Self and Others, Increase Positive Thinking (45-60 minutes)	- To promote staying mindful and learning about self and others - To promote self-awareness	Practicing with observation of breathing, awareness of each body part, using physical senses, and observing the sensations Reviewing thoughts, feelings, and emotions of both satisfaction and dissatisfaction; Encouraging mutual understanding and good relationships; Reflecting on and managing positive and negative feelings
Strategy 5: Encourage Self-Esteem and Self- Worth (45-60 minutes)	- To learn the differences between people and their strong and weak points - To explore personal strengths and weaknesses and the need to promote self-worth	Practicing seeking self, identifying good parts, and considering parts needing improvement through drawing pictures; Discussion about drawings of good parts and parts needing improvement Reflecting on the benefits of the activities

Table A1. The SRBP program (Cont.)

Week/Strategy/Time	Objectives	Activities
Week 3 **Strategy 6:** Encourage Understanding of Others' Emotions of Self and Others (45-60 minutes)	- To notice the feelings arising within one's heart when personal emotions are felt	Encourage impressions and feelings through drawing Discussion and sharing of experiences about positive and negative emotions
Strategy 7: Encourage Self-Control and Emotional Control (45-60 minutes)	- To understand personal emotions and feelings when confronted with difficult situations - To increase knowledge about self-control - To establish self-control ability and relaxation	The participants were asked, "What are the emotions of general people? How does expressing our emotions affect us and others? Discussion about experiences with anger, causes, effects, and management; Practicing reflection of own emotions and control by using an emotional ticker record; Reflection on causes, tickers, and impact on relationships through "My Balloon Game"
Strategy 8: Increase Knowledge about Religious Principles (45-60 minutes)	- To promote awareness and recognize the importance of traditional principles - To increase the knowledge of Islamic principles	Watching the animation "Teaching My Daughter"; Discussion and sharing of opinions on topics including good and bad Muslim females and how religious principles can prevent SRBs in girls Reflecting on the provisions of Muslim females
Week 4 **Strategy 9:** Encourage Creative Thinking, Problem-Solving and Increase Life Skills Knowledge (45-60 minutes)	- To encourage creative thinking - To increase knowledge and experience about problem-solving styles	Practicing creative thinking skills through activities (9 circles) Assessing personal problem-solving styles and others' styles through storytelling with pictures Reflecting on various solutions from the problem-solving styles
Strategy 10: Encourage Analyze Ability and Appropriate Decision-Making (45-60 minutes)	-To increase analytical skills and decision-making in problem-solving and learning from others -To apply analytical skills and decision-making to problem-solving in daily life	Watching a video clip about SRBs occurring among teenage girls in three different situations, including peer influence, being with men in private, unsafe places for girls Discussion, analysis and sharing of ideas on why a problem is risky and how to avoid it; Empowering and encouraging participants to believe in personal strength and intelligence; Reflection on refusing and problem-solving

Table A1. The SRBP program (Cont.)

Week/Strategy/Time	Objectives	Activities
Strategy 11: Increase Analytic Skills and Encouraging Problem-Solving Skills (30-45 minutes)	- To increase analytical skills related to problem-solving - To relax and increase teamwork	Playing "Magic Square Game" with four difficult levels Summary of slowly analyzing the causes of problems and carefully finding solutions that connect to analytical and creative ability
Immediate post-test 1 12-weeks post-test 2 24-weeks post-test 3	- To evaluate self-efficacy for safe sexual behaviors - To evaluate sexually intimacy	The self-efficacy for safe sexual behaviors and sexually intimate behaviors scores were evaluated immediately, 12 weeks, and 24 weeks after the program.

*The mother or legal guardians were involved in the program in sessions 1-3.

* Culture awareness in all strategies of activities

ผลของโปรแกรมการป้องกันพฤติกรรมเสี่ยงทางเพศในวัยรุ่นหญิงตอนต้นไทยมุสลิม : การศึกษากึ่งทดลอง

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บทคัดย่อ: พฤติกรรมเสี่ยงทางเพศในวัยรุ่นหญิงมุสลิมแตกต่างจากวัยรุ่นหญิงในกลุ่มอื่นๆ เนื่องจากวัฒนธรรมและวิถีชีวิตที่แตกต่าง เช่น การแต่งงานตั้งแต่อายุน้อย มีมารดาวัยรุ่นและมีการติดโรคติดต่อทางเพศสัมพันธ์เพิ่มขึ้น ส่งผลให้วัยรุ่นหญิงมุสลิมขาดโอกาสทางการศึกษา การศึกษากึ่งทดลองนี้มีวัตถุประสงค์เพื่อทดสอบผลของโปรแกรมป้องกันพฤติกรรมเสี่ยงทางเพศในวัยรุ่นหญิงตอนต้นไทยมุสลิมต่อการรับรู้ความสามารถของตนเองในการมีพฤติกรรมทางเพศที่ปลอดภัย และการป้องกันพฤติกรรมเสี่ยงทางเพศ ผู้เข้าร่วมการศึกษาเป็นวัยรุ่นหญิงไทยมุสลิมที่กำลังศึกษาชั้นประถมศึกษาปีที่ 4-6 จำนวน 48 คน สุ่มแบบเจาะจงจากโรงเรียนแห่งหนึ่ง โดยมีมารดา/ผู้ปกครองเข้าร่วมโปรแกรม กลุ่มทดลอง (n = 23) ได้รับโปรแกรมการป้องกันพฤติกรรมเสี่ยงทางเพศและการสอนเพศศึกษา กลุ่มควบคุม (n = 24) ได้รับการสอนเพศศึกษาตามปกติ ศึกษาระหว่างเดือนมิถุนายนถึงพฤศจิกายน พ.ศ. 2566 เครื่องมือวิจัย คือ แบบสอบถามการรับรู้ความสามารถตนเองในการมีพฤติกรรมทางเพศที่ปลอดภัย และ แบบสอบถามพฤติกรรมทางเพศที่ไกล้ชิด วิเคราะห์ข้อมูลด้วยสถิติการทดสอบค่าที ความแปรปรวนทางเดียวแบบวัดซ้ำ ผลการศึกษาพบว่า ค่าคะแนนเฉลี่ยการรับรู้ความสามารถตนเองในการมีพฤติกรรมทางเพศที่ปลอดภัยของกลุ่มทดลองสูงกว่ากลุ่มควบคุม ทั้งหลังการทดลองทันที หลังได้รับโปรแกรม 12 และ 24 สัปดาห์ และกลุ่มทดลองมีพฤติกรรมทางเพศที่ไกล้ชิดต่ำกว่ากลุ่มควบคุมหลังได้รับโปรแกรม 12 และ 24 สัปดาห์ ดังนั้น ผลของโปรแกรมนี้แสดงถึงการมีประสิทธิภาพของโปรแกรมในการป้องกันพฤติกรรมเสี่ยงทางเพศในวัยรุ่นหญิงตอนต้นไทยมุสลิม พยาบาลสามารถนำโปรแกรมนี้ไปใช้เพื่อป้องกันพฤติกรรมเสี่ยงทางเพศในวัยรุ่นหญิงได้ อย่างไรก็ตาม ควรมีการทดสอบในกลุ่มอื่น ๆ เพิ่มเติม ก่อนนำไปใช้ในวงกว้าง

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คำสำคัญ : วัยรุ่นตอนต้น วัยรุ่นหญิงมุสลิม เพศสัมพันธ์ที่ปลอดภัย การรับรู้ความสามารถของตนเอง การป้องกันพฤติกรรมทางเพศ พฤติกรรมทางเพศที่ไกล้ชิด พฤติกรรมเสี่ยงทางเพศ

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