

# Predicting Factors of Pre-coital and Sexual Behaviors among Thai Muslim Adolescents: A Cross-sectional Study

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**Abstract:** Pre-coital and sexual behaviors are precarious and may lead adolescents to face higher rates of unwanted pregnancies and sexually transmitted infections. This cross-sectional study aimed to determine the factors predicting pre-coital and sexual behaviors among Muslim adolescents in southernmost Thailand. Seven hundred adolescents were recruited from a vocational college and four schools. Sexual risk behaviors and its related factors questionnaires were employed for data collection. Descriptive statistics were used to describe the demographic characteristics of the participants; binary and ordinal logistic regression was used to examine the factors explaining sexual risk behaviors.

The results indicated that increased age was a predicting factor for higher pre-coital and sexual behaviors. For interpersonal factors, knowledge of sexual risk behaviors was a protective factor, while perceived parent and peer approval of sex and perceived peer norms predicted higher pre-coital and sexual behaviors. More parental monitoring was a protective factor for lower pre-coital behaviors. For environmental factors, cultural norms were a significant protective factor, while neighborhood disorganization predicted higher pre-coital behaviors. In conclusion, age, parental approval of sex, and perceived peer norms were predictors of sexual and pre-coital behaviors. These findings provide useful information for healthcare providers, especially nurses, to develop the intervention with the protective factors and predictors of sexual and pre-coital behaviors. We recommend action research that includes all community stakeholders to develop an intervention to prevent sexual risk behaviors among Muslim adolescents.

**Keywords:** Adolescent, Muslim, Precoital behavior, Sexual risk behaviors, Southern Thailand

Received 27 April 2023; Revised 7 October 2023;  
Accepted 22 October 2023

## Introduction

Sexual risk behaviors impact sexual intercourse and increase the risk of unintended pregnancies or lead to transmission of sexually transmitted infections (STIs), including human immunodeficiency virus (HIV) or AIDS.<sup>1</sup> Data from Muslim countries have shown a range of early sexual intercourse, for example, 32.9% in Iran,<sup>2</sup> and 5.3% in Indonesia, with the largest Muslim population.<sup>3</sup>

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Sexual practices in Muslims are unique from other religious groups. Islam gives its believers practical and beneficial guidance for all aspects of life, including prohibiting sexual relationships outside marriage associated with severe consequences for those who violate this

rule.<sup>4</sup> Islam emphasizes the prevention of social crimes rather than the proliferation of opportunities for them. Islamic law prescribes severe punishments for sex-related offenders, regarded as both anti-social and anti-family. Therefore, marriage is considered the only channel for fulfilling sexual urges. However, this tenet seems to counter real life, especially regarding sexual risk behaviors among adolescents. They experience major physical changes, making them vulnerable because they are at the greatest risk of violating this cultural contract in Muslim countries. All Muslims are expected to follow the Prophet Mohammad's Islamic principles. Condom use and contraception are only acceptable under conditions where a pregnancy would cause harm to a woman. Condom use and contraception are not acceptable for premarital sex. The prevalence of sexual risk behaviors is increasing in Muslim adolescents, and most of these practices are hidden. Sexual risk behaviors and factors that impact sexual risk behaviors need to be understood, especially in the cultural norms of Muslims. Therefore, it is crucial to study all the relevant factors related to sexual risk behaviors among Muslim adolescents and the perception of cultural norms that can influence their behaviors.

Studies on sexual and pre-coital behaviors among Muslim adolescents are limited, especially considering its various impact factors. Our study,<sup>5</sup> using the same participants as in this study, presented the sexual risk behaviors and examined whether gender differences existed in explaining the relationships between identified factors and sexual behaviors. This current study provides a deeper understanding of not only sexual behaviors but also pre-coital behaviors. It examines predictive factors of sexual and pre-coital behaviors of Thai Muslim adolescents. The findings would guide the intervention development to prevent unwanted pregnancy and STIs.

## **Review of Literature and Conceptual Framework**

This study was guided by applying Bronfenbrenner's ecological theory<sup>6</sup> and relevant literature. This theory

of human development presents the influences of all of the systems that play a role in impacting the lived experiences of the individual, no matter how remote the influences. Based on the theory, sexual risk behaviors were influenced by multiple factors and categorized into three levels, namely individual, interpersonal, and environmental factors, and this model helped to explore the issue within a Muslim context and determine how the contributing factors were related to each other.<sup>6</sup> Individual factors include gender.<sup>7</sup> Gender had no significant differences reported between high school male and female students regarding unsafe sexual practices. Males demonstrated higher rates of sexual risk-taking behaviors, which is consistent with the study of Settheekul and colleagues,<sup>8,9</sup> in that there was a higher rate of males than females engaging in sexual risk behaviors. Additionally, being female is a predictor of sexual risk behaviors.<sup>10</sup> While, sexual risk behavior prevention knowledge<sup>11,12</sup> such as knowledge related to safe sex, contraceptive use, and sexual reproductive health are protective factors against adolescent sexual risk behaviors.<sup>10</sup> However, previous research indicated no significant association between prevention knowledge and sexual risk behaviors.<sup>13</sup> Additionally, religious beliefs and practices were negatively correlated with pre-coital sexual behaviors, including kissing, oral sex, and vaginal sex.<sup>14</sup> Interpersonal factors, especially peer pressure, increased the likelihood of engaging in sexual behaviors.<sup>15</sup> Moreover, Settheekul and colleagues<sup>9</sup> found that perceived peer norms influenced Buddhist adolescents in Northern Thailand to engage in high-risk sexual behaviors. High parental approval of sex, less parental monitoring, uninvolved parenting styles, and less parent-adolescent communications were significantly associated with higher sexual risk behaviors. High social media use was related to higher rates of sexual risk behaviors. Adolescents who sent more than 100 text messages per day were significantly associated with higher sexual risk behaviors.<sup>16</sup>

Sexual risk behaviors (SRB) are any actions that increase one's chance of having sex, getting

pregnant unintentionally, catching an STI like HIV, or engaging in sexual activity. Early sexual initiation, many partner relationships, unprotected sexual contact, and pre-coital activities are all considered SRB. Any risky actions, such as kissing and petting,<sup>17</sup> holding hands, and embracing, that occur before sexual contact are referred to as pre-coital behaviors.<sup>18</sup> Pre-coital activity predominance might be a useful supplementary indicator of sexual risk behaviors for STIs, HIV, and unintended pregnancies.<sup>19</sup> Pre-coital practices can be used to prolong a relationship and to create a sexual connection.<sup>20</sup> Some research studies have also assessed sexual experience before the start of sexual activity. According to a study of Spanish teenagers, males begin engaging in pre-coital activities sooner than girls.<sup>17</sup> While kissing is more common among boys than among girls, and twice as many males as females were observed caressing above and below garments, teenagers in Lima, Peru, hugged and held hands in about equal numbers.<sup>17</sup> Hugging, kissing, holding hands, caressing above clothes, and touching below clothing were the stages of pre-coital activity for both boys and females.<sup>18</sup> This was also true for teenagers who had dated and were likelier to participate in pre-coital behavior.<sup>17</sup> Researchers in Thailand discovered that pre-coital behaviors were much higher among teenagers living in Bangkok who experienced parental disapproval of sex, exposure to pornographic media, low sexual refusal self-efficacy, and had a boy/girlfriend.<sup>21</sup> In northern Thailand, it was found that male adolescents were more inclined than female adolescents to participate in pre-coital behaviors and that pre-coital behaviors were significantly predicted by age, sexual refusal self-efficacy, having boyfriends or girlfriends, strict parenting style, parental support for sex, and perceived peer norms.<sup>9</sup>

According to our previous publication,<sup>5</sup> Muslim adolescents had sexual experiences, 9% of whom did not use a condom, 41.3% and 54% had sexual intercourse more than once. They were infected with an STI and became pregnant more than once. Moreover, our

findings presented that the factors of high religiosity and practice of Islam daily were not different between boys and girls. However, Islam recognizes that culture significantly impacts sexual behavior,<sup>22</sup> particularly when it comes to cultural taboos that prevent younger generations from speaking about sex with their parents.<sup>25,26</sup> Furthermore, Muslim religious convictions forbid using condoms and other contraception to maintain the prohibition of having sex before marriage.<sup>22</sup> According to research on behavioral settings, each context has a unique set of social norms.<sup>25,26</sup> The nature of norms in a neighborhood is less obvious. Certain neighborhood traits, such as the prevalence of alcohol and drug addiction marketing, may serve as cues for healthy behavior. There is evidence to support the social influence of people who are not strongly connected, even though most network literature has concentrated on the prospective power of close links. It might be easier to understand how people in a neighborhood might impact one another's actions if we consider the social effect of unfamiliar people.<sup>27</sup> Additionally, proximity frequently results in friendships, which may increase the effect of neighbors on one another. Social norms have been utilized in HIV prevention and treatments for drug abuse.<sup>28</sup>

For teenagers, STIs and unwanted pregnancy crises continue to be an issue. However, there is little research on Muslim teenagers, and sexually risky behaviors are growing and mostly going unreported. The main causes of STIs and unplanned pregnancies involve sexual risk behaviors. Thus, this study aimed to determine whether the individual, interpersonal, and environmental factors can predict sexual risk behaviors, including pre-coital and sexual behaviors among Thai Muslim adolescents in a southern border province of Thailand.

## **Methods**

**Study Design:** A descriptive cross-sectional design was used. This report followed the STROBE

Statement—Checklist of items that should be included in reports of cross-sectional studies.

The study presented here is part of a larger study, part of which has been previously published.<sup>5</sup>

### **Sample and Sampling**

We enrolled a sample of 700 Thai Muslim adolescents aged 14–19 from October 2018 to January 2019 by convenience sampling using an online questionnaire. Four secondary schools and a vocational college were randomly selected from a province in southern Thailand. The study's sample size was calculated based on the rules of thumb for multiple ordinal logistic regressions. The rule of thumb indicates ten or more cases per predictor variable. However, the prediction rules in rare cases required 40 or more cases per predictor variable.<sup>29</sup> Because sexual risk behaviors were considered rare events and this study has 15 predictors, the sample size was determined to be  $15 \times 40 = 600$  cases. Considering the possible loss of sample responses, 30% of the sample was added to account for attrition.<sup>30</sup> The total number of samples was  $= 600 + 180 = 780$  cases. The participants were recruited into the study using posters and cards with a privacy password at their schools in southern Thailand, which offered access to the online questionnaire.

### **Ethical Considerations**

This study was approved by the Research Ethics Committee, Faculty of Nursing, Chiang Mai University, with a study code 2018-FULL017. This study was considered for a waiver of a parental permission as it involved the investigation of adolescents' beliefs and behavior regarding sexuality as indicated in the informed consent process from the Declaration of Helsinki 2013 and CIOM Guideline 2016.<sup>31</sup>

**Instruments:** The existing instruments from Settheekul and colleagues<sup>9</sup> were employed with permission. The instruments comprise two parts:

**Dependent variable:** The Sexually Risky Behavior Questionnaire (SRBQ) consists of a series of sections about pre-coital and sexual behaviors. In total, there are 29 items.

**Independent variables:** factors related to pre-coital and sexual behaviors, which consist of individual factors including demographic data (age, gender, social media use), religious beliefs and practices, sexual risk behavior prevention knowledge, and sexual refusal self-efficacy. Interpersonal factors included parenting styles regarding authoritarian, authoritative, uninvolved, and permissive parenting styles, assessed participants' perceptions, parent-adolescent communication, parental monitoring, perceived parent and peer approval of sex, and peer norms. The environmental factors comprise questions about neighborhood disorganization, neighborhood social control, neighborhood social cohesion, and cultural norms.

The reliability of the SRBQ and three-factor level questionnaires of Settheekul and colleagues<sup>9</sup> were tested through a pilot study with 30 adolescents who met the same criteria as the study sample from a school in southern Thailand. These participants were excluded from participation in the main study. The descriptions, the example items, and the reliabilities of all instruments are shown in **Appendix, Table 1**.

### **Data Collection**

Online questionnaires with privacy passwords were used for data collection. We advertised the study by providing information on the website in the class. The questionnaire included informed consent and allowed respondents to decide whether to participate in the study without coercion. They could click to do the questionnaire if they are willing to participate. They could stop the questionnaire at any time.

**Statistical Analysis:** We used descriptive statistics to describe the demographic characteristics of the participants who exhibited pre-coital and sexual behaviors. Binary and ordinal logistic regression were used to examine the factors predicting sexual and pre-coital behaviors.

## **Results**

### **Characteristics of Participants**

Seven hundred Muslim adolescents participated in the study (**Table 1**). More females participated than males (67.14 and 32.86%, respectively). Approximately

415 (59.3%) participants were senior high school students. Most of them used social media (98.8%),

lived with both parents (72.9%), had an equal degree of high religiosity, and practiced Islam daily.

**Table 1.** Demographic characteristics of Muslim adolescents (n = 700)

Demographic characteristics	Number	Percent (%)
Age		
14–16 years	395	56.4
17–19 years	305	43.6
Gender		
Female	470	67.14
Male	230	32.86
Education level		
Junior high schools	190	27.1
Senior high schools	415	59.3
Vocational schools	95	13.6
Social media use		
Never	8	1.1
Yes	692	98.9
Family status		
Parents lived together	512	72.9
Parents divorced	112	16.0
Parents deceased	78	11.1
Religiosity		
No	15	2.1
Low	73	10.4
Moderate	231	33.0
High	381	54.5
Religious practices		
Never	34	4.9
1–3 times/year	134	19.1
Once a month	152	21.7
Daily	380	54.3

**Table 2** shows the factors correlated with sexual and pre-coital behaviors. The group of individual factors, gender, and age were positively correlated with sexual behaviors and pre-coital behaviors ( $p < 0.01$ ). In contrast, knowledge concerning sexually risky behavior prevention and sex refusal self-efficacy were negatively correlated with sexual behaviors and pre-coital behaviors ( $p < 0.01$ ). However, religious beliefs and practices were not significant. For interpersonal factors, the uninvolved parenting style was positively correlated

with sexual behaviors and pre-coital behaviors ( $p < 0.05$ ), ( $p < 0.01$ ), respectively. Regarding the environmental factors, neighborhood disorganization was positively correlated with sexual behaviors and pre-coital behaviors ( $p < 0.01$ ), ( $p < 0.01$ ), respectively. In contrast, neighborhood social cohesion was negatively correlated with pre-coital behavior. In contrast, cultural norms were negatively correlated with pre-coital behaviors and sexual behaviors among Thai Muslim adolescents ( $p < 0.01$ ) and ( $p < 0.05$ ), respectively.

**Table 2.** Correlations between the independent and dependent variables (n = 700)

Variables	Sexual risk behaviors	
	Pre-coital behaviors	Sexual behaviors
<b>Individual factors</b>		
Gender	0.18**	0.11**
Age	0.12**	0.14**
Religious beliefs and practices	-0.07	-0.01
Sexual risk behaviors-prevention knowledge	-0.17**	-0.11**
Sexual refusal self-efficacy	-0.17**	-0.16**
<b>Interpersonal factors</b>		
Parenting style		
Authoritarian parenting style	-0.03	-0.04
Permissive parenting style	-0.01	-0.04
Uninvolved parenting style	0.10**	0.09*
Authoritative parenting style	-0.07	-0.07
Parent-adolescent communication	0.07	0.06
Parental monitoring	-0.17**	-0.14**
Perceived parent and peer approval of sex	0.31**	0.23**
Perceived peer norms	0.30**	0.22**
<b>Environmental factors</b>		
Neighborhood disorganization	0.19**	0.16**
Neighborhood social control	0.01	-0.01
Neighborhood social cohesion	-0.13**	-0.07
Social media	-0.07	-0.11**
Cultural norms	-0.18**	-0.09*

\*p < 0.05, \*\*p < 0.01,

#### Factors predicting sexual behaviors and pre-coital behaviors

Binary logistic regression and ordinal logistic regressions were used to predict this study's nominal dependent and ordinal dependent variables. We found the model fit was significant with a Chi-square = 164 (df = 18, p < .01) in all Muslim adolescents (n = 700). The goodness of fit was insignificant, suggesting that the data fitted, and the pseudo-R<sup>2</sup> of Nagelkerke was 35.5%. The dependent variables were measured on the nominal level (sexual behavior scores, which have two orders) (Table 3) and on an ordinal level (pre-coital behaviors, which have three orders) (Table 4). One or more of the independent variables were continuous (age, scores of each factor in individual, interpersonal,

and environmental factors except social media), nominal (gender: male = 1, not male = 0), or ordinal (doing the activity every week = 2, doing the activity 1-3 times/month = 1, and never doing the activity = 0). Logistic regression does not require linear relationships between the independent and dependent variables. The dependent variable does not have to be normally distributed, and logistic regression has no homogeneity of variance assumptions. The correlation between each pair of independent variables was less than < 0.80, assuming no multicollinearity existed.

As illustrated in **Table 3**, binary logistic regression was used to analyze predictive factors of sexual behaviors. For the individual factors, a one-year increase in age with the odds of sexual behaviors increased by 1.42



times, while the increase in the odds of sexual refusal self-efficacy with sexual behaviors decreased by 1%. Regarding interpersonal factors, a one-unit increase

in the perceived parent and peer approval of sex and perceived peer norms, the odds of sexual behaviors increased by 1.26 and 1.07 times, respectively.

**Table 3.** Binary logistic regression model predicting sexual behaviors in Muslim adolescents (n = 700)

Factors	Sexual behaviors	
	OR	95% CI
<b>Individual factors</b>		
Gender	0.95	[0.50, 1.83]
Age	1.42**	[1.13, 1.78]
Religious beliefs and practices	0.98	[0.87, 1.10]
Sexual risk behaviors-prevention knowledge	0.86	[0.70, 1.06]
Sexual refusal self-efficacy	0.99*	[0.98, 0.99]
<b>Interpersonal factors</b>		
Parenting style		
Authoritarian parenting style	1.11	[0.91, 1.36]
Permissive parenting style	0.84	[0.67, 1.05]
Uninvolved parenting style	1.05	[0.87, 1.26]
Authoritative parenting style	1.04	[0.87, 1.25]
Parent-adolescent communication	1.03	[0.99, 1.08]
Parental monitoring	0.93	[0.86, 1.01]
Perceived parent and peer approval of sex	1.26*	[1.02, 1.56]
Perceived peer norms	1.07**	[1.02, 1.11]
<b>Environmental factors</b>		
Neighborhood disorganization	1.04	[1.00, 1.08]
Neighborhood social control	0.90	[0.72, 1.13]
Neighborhood social cohesion	0.97	[0.84, 1.12]
Social media	4.66	[0.72, 30.20]
Cultural norm	0.93	[0.84, 1.04]

\*p < 0.05, \*\*p < 0.01, CI = confidence interval for odds ratio (OR)

As illustrated in **Table 4**, the ordinal logistic regression analysis was performed to examine predictive factors of pre-coital behaviors. The model fit was significant, indicating that overall, the predictors in the model were significantly explaining high pre-coital behaviors ( $\chi^2 = 164$ , df = 18, p < .01). In contrast, the goodness of fit was not significant, indicating that the data fit well with the proposed predictive model. The predictors explained 35.5% of the variance in adolescents with high engagement in pre-coital behaviors (Nagelkerke  $R^2 = .355$ ). The results showed that the odds of pre-coital behaviors increased by 1.20 times with a one-year age increase, while the odds of sexually

risky behaviors prevention knowledge increased with a decrease in the pre-coital behaviors by 19% (OR = 0.81, p < 0.05). For the interpersonal factors, the odds of pre-coital behaviors increased by 1.46 and 1.09 times, respectively, with a one-unit increase in perceived parent and peer approval of sex and perceived peer norms. In contrast, pre-coital behaviors decreased by 7% with an increase in the odds of parental monitoring (OR = 0.93, p < 0.05). Concerning the environmental factors, the odds of pre-coital behaviors increased by 1.04 times with a one-unit increase in neighborhood disorganization. In contrast, pre-coital behaviors decreased by 18% with increased odds of cultural norms.

**Table 4.** Ordinal logistic regression model predicting pre-coital behaviors in Muslim adolescents (n = 700)

Factors	Pre-coital behaviors	
	OR	95% CI
<b>Individual factors</b>		
Gender	1.39	[0.81, 2.41]
Age	1.20*	[1.01, 1.45]
Religious beliefs and practices	0.91	[0.83, 1.01]
Sexual risk behaviors–prevention knowledge	0.81*	[0.68, 0.96]
Sexual refusal self-efficacy	1.00	[0.99, 1.00]
<b>Interpersonal factors</b>		
Parenting style		
Authoritarian	1.14	[0.96, 1.35]
Permissive	0.88	[0.73, 1.07]
Uninvolved	1.05	[0.90, 1.22]
Authoritative	1.03	[0.89, 1.20]
Parent–adolescent communication	1.02	[0.98, 1.05]
Parental monitoring	0.93*	[0.87, 0.99]
Perceived parent and peer approval of sex	1.46**	[1.23, 1.74]
Perceived peer norms	1.09**	[1.05, 1.12]
<b>Environmental factors</b>		
Neighborhood disorganization	1.04*	[1.01, 1.08]
Neighborhood social control	1.00	[0.83, 1.21]
Neighborhood social cohesion	0.94	[0.82, 1.06]
Social media	0.65	[0.81, 2.41]
Cultural norms	0.82**	[0.75, 0.90]

\*p < 0.05, \*\*p < 0.01, CI = confidence interval for odds ratio (OR)

## Discussion

In this current study, factors identified from the ecology theory<sup>6</sup> were examined. The findings indicated that not all factors derived from each set of major factors, individual, interpersonal, and environmental, were significant in predicting sexual and pre-coital behaviors. For those significant predictive factors, they were risk and protective factors.

We found three significant risk factors for both sexual behaviors and pre-coital behaviors. These were advanced age, perceived parent and peer approval of sex, and perceived peer norm. Sexual risk behaviors increased with the age of adolescents,<sup>22</sup> and younger

age was associated with contraceptive non-use.<sup>22</sup> Additionally, individuals at a younger age are at higher risk of acquiring HIV and other STIs and experiencing unplanned pregnancy as they engage more in sex without protection. A cross-sectional study in Iran, predominantly a Muslim country, showed a significant increase in unsafe sexual behaviors among adolescents with increasing age.<sup>2</sup>

Regarding perceived parent and peer approval of sex, our study is consistent with a study by Setthekul et al., who reported that perceived parent and peer approval of sex was associated with an increased likelihood of pre-coital behaviors among adolescents.<sup>9</sup> Previous research noted that some mothers approved



of their children's use of birth control when under the impression that the children were engaged in sexual activity or were about to engage in such activity.<sup>32</sup> Perceived parent and peer approval of sex significantly predicted pre-coital and sexual behaviors among adolescents with a boyfriend or girlfriend.<sup>9</sup> However, the findings could not ascertain if there were any differences in peer pressure among sexually active and sexually inactive adolescents.

In addition, neighbor disorganization, one of the environmental factors, was found to be a significant risk factor for pre-coital behaviors. This may be because neighborhood disorganization could lead to sexual risk behaviors,<sup>33</sup> possibly because neighborhood disorganization is linked with adolescent problem behaviors. For example, adolescents in a neighborhood with substance abuse issues in the community are more likely to join a gang when residential inconstancy and disorder are prevalent.

Three factors were found to be protective factors preventing Muslim adolescents from engaging in pre-coital behaviors. These included sexual risk behavior prevention knowledge, parental monitoring, and cultural norms. Parental monitoring was a significant protective factor for pre-coital behaviors, consistent with the study by Dittus and colleague<sup>34</sup> that showed higher parental monitoring was associated with deferred participation in sexual intercourse, increased contraceptive use, and increased condom use among adolescents. Parental monitoring is likely effective for protecting adolescents from the problems caused by social media use.<sup>34</sup> It is also possible that parental monitoring may buffer adolescents' problems by having more frequent discussions with children concerning involvement in specific activities. Moreover, previous knowledge of the cultural norms regarding the behaviors of females to be sexually abstinent and protect their virginity,<sup>35</sup> is a part of the cultural norm in Southern Thailand. Cultural norms were a protective factor for pre-coital behaviors. Having boyfriends or girlfriends and having premarital sex is strictly taboo and heavily sanctioned by the community. The study did not identify any community concerns

regarding the knowledge or prevention of sexual risk behaviors or the strategies needed to allow the community to conduct self-awareness to resolve this issue. Previous research revealed that cultural norms should be considered to prevent sexual risk behaviors among adolescents.<sup>36</sup>

For sexual behaviors, the findings show that sexual refusal self-efficacy was the only significant protective factor. Although only a 1% reduction of the probability that Muslim adolescents would engage in sexual behaviors, this is considered practically significant. Enhancing Muslim adolescents' sexual refusal self-efficacy through higher sexual refusal self-efficacy can exhibit less risky sexual behaviors.

Surprisingly, we did not find a significant contribution of an important individual factor: religious beliefs and practice, and an interpersonal factor: parenting styles, on both sexual and pre-coital behaviors. The finding can be explained by the fact that in the Quran, parents are expected to discuss and explain sexuality with their children, as well as how to follow the religious rules inside and outside of marriage. Parents are also cautioned about engaging in misbehaviors in front of their children, such as expressing careless sexual jokes without considering their children's developmental stage, as it could result in motivating the imagination and eventual engagement in forbidden sexual acts.<sup>36</sup> Islam encourages Muslims to communicate with children about sex, but most parents talk with their children about daily experiences unrelated to sex.<sup>22</sup> Future studies are needed to better understand parents' concerns regarding sexual behaviors and how to appropriately communicate about sex based on the developmental stages of children.

Being male or female and whether they used social media also did not explain if they would engage in risky sexual behaviors. The findings found that social media was adolescents' main communication. Adolescents can receive knowledge about sexual risk prevention from social media to help them to protect themselves.<sup>37</sup> In contrast, adolescents who used social

media to send more than 100 text messages daily were associated with significantly higher sexual risk behaviors,<sup>37</sup> and previous research indicated that social media use was associated with all sexual behaviors. However, this study did not explore precisely what forms of social media adolescents used or the primary purposes for their social media usage.

A set of environmental factors that did not have a predictive ability to explain the variation in sexual and pre-coital behaviors were neighborhood social control and neighborhood social cohesion. Possibly, neighbors encompass the expectation in the active engagement of supporting and controlling neighborhood adolescents.<sup>38</sup> The neighborhood social control reflects the residents' willingness to intervene in a risky situation.<sup>38</sup> Additionally, neighborhood social cohesion was social ties and trust among neighbors, and neighbors know how supportive the community is and whether they connect and trust their neighbors.<sup>38</sup> Neighborhood social cohesion is related to adolescent problem behaviors and has been correlated with pre-coital behaviors.<sup>9</sup>

### **Limitations**

The convenience sampling technique limited the generalizability of this study because we recruited only from one province and not the other two mainly Muslim provinces in the southern part of Thailand, and may limit generalization to those from other Muslim communities. However, our sample was large enough to be considered representatives of Muslim adolescents regarding their sexual behaviors and the factors related to a better understanding of sexual engagement. In addition, social desirability may influence the participant's response to self-report questionnaires.

### **Conclusions and Implications for Nursing Practice**

Individual, interpersonal, and environmental factors influence sexual and pre-coital behaviors. We found significant predictors in both sexual and

pre-coital behaviors. Therefore, further studies are needed to better identify the thought processes of adolescents who are sexually active and identify peer and environmental pressures that those adolescents experience in action-based community research. Cultural norms were equally important in the sexual risk behaviors for pre-coital behaviors of Muslim adolescents. Sharing responsibility from parents about sexual risk behaviors seemed to be a highly protective factor against engaging in such activities. Sharing responsibility from parents about pre-coital and sexual behaviors seems highly protective of not engaging in sexual risk behaviors. These findings have implications for educators, religious leaders, and community health workers who must work with communities to develop sexual risk behavior-prevention interventions with participatory action research.

### **Acknowledgments**

We thank Thailand's Ministry of Higher Education, Science, Research and Innovation (MHESI) for financial support. Moreover, thank you to the teachers and administrators of the schools and vocational college for their cooperation and to all the Thai Muslim adolescents who participated in this study. The publication of this study was supported by the 1<sup>st</sup> International Conference in Palliative Care and Family Health Nursing, June 26-27, 2023, Faculty of Nursing, Thammasat University.

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## Appendix

**Table 1.** Instrument description, example of items, possible range score, and reliability of instruments in the actual study

Instrument and number of items	Description	Example item	Possible range score	Reliability		
				Type	Pre-test (n = 30)	Actual study (n = 700)
Pre-coital behaviors (9 items) (ordinal scale)	The questions about pre-coital behaviors, particularly about watching pornographic media, finding partners via the internet, drinking alcohol, and using illegal drugs, as well as holding hands, hugging, and kissing intimate partners The higher score indicates higher engaging in behaviors. Responses were on a 3 points ordinal scale: never = 0 sometime = 1 regularly=2	How often do you watch pornographic media?	0-18	$\alpha$	0.88	0.91
Sexual behaviors (20 items) (nominal scale)	This part involved sexual preferences that assessed having experienced sexual intercourse, multiple sexual partners, condom use, contraceptive pill use, sexually transmitted infections (STIs), and pregnancies. Responses were dichotomous: never = 0, yes = 1	Have you ever experienced sexual intercourse?	0,1	N/A	N/A	N/A
Gender, social media use (nominal scale), and age (continuous data)	gender	male or female	0,1	N/A	N/A	N/A
	social media use	yes, no	0,1			
	age	Indicate the age ....	14-19			
The Religious Beliefs and Practices Questionnaire (5 items)	Islamic beliefs and practices (whether they practice regularly or not) and how often the participant's practice. Responses are on an ordinal scale. Responses in four levels were 3 doing the activity every time, 2 doing the activity once a month, 1 once a year, and 0 never doing the activity. Higher scores indicate more religious beliefs and practices.	Do you follow religious teachings?	0-15	$\alpha$	0.86	0.82
Sexual Risk Behavior Prevention Knowledge Questionnaire (10 items)	The questions were dichotomous, "yes" or "no" and were slightly different for boys and girls The total scores range from 0-10, where 7-10 is considered high, 4-6 moderate, and 0-3 low sexual risk behaviors prevention knowledge.	Is it correct that proper use of condoms can reduce the risk of contracting sexually transmitted diseases?	0-10	KR-20	0.72	0.79

**Table 1.** Instrument description, example of items, possible range score, and reliability of instruments in the actual study (Cont.)

Instrument and number of items	Description	Example item	Possible range score	Reliability		
				Type	Pre-test (n = 30)	Actual study (n = 700)
The Sexual Refusal Self-Efficacy Questionnaire (5 items)	The instrument consisted of three scenarios to assess self-confidence to refuse sexual intercourse. The questions are different for boys and girls. Responses were measured on a 10-item Likert scale to assess the confidence level for each question. The scale ranges from 0 for not confident of competency to refuse sexual intercourse to 10 for very confident of competency to refuse sexual intercourse.	How confident are you? You will be able to refuse to have sex, if your lover refuses to use a condom.	0–60	$\alpha$	0.88	0.95
The Parenting Style Questionnaires (20 items)	The questions were about authoritarian, authoritative, uninvolved, and permissive parenting styles assessed participants' perceptions. The parenting style questionnaire ranged from 0–10, where 7–10, 4–6, and 0–3 meant a high, medium, and low level for each style, respectively.	How strongly do you agree that your parent always let you do somethings alone?	0–40	$\alpha$	0.85	0.81
The Parental Monitoring Questionnaires	Questionnaire ranged from 0–28, where 19–28, 10–18, and 0–9 meant high, medium, and low parental monitoring, respectively.	How strongly do you agree that your parents let you stay at home alone?	0–28	$\alpha$	0.80	0.84
The Parent-adolescent Communication	The questionnaire consisted of opinions about adolescents' sexual risk behaviors prevention communication with their parents, which contains 4 items on a 4-point Likert scale, and the frequency of sexual risk behaviors prevention communication between parents and adolescents assessing how often parents talked about reproductive health, abstinence, and safe sex with their adolescents. Scores range from 0 to 42, where 29–42, 15–28, and 0–14 meant high, medium, and low parent-adolescent communication, respectively.	How strongly do you agree that discussing about sex with parents is embarrassing?	0–34	$\alpha$	0.84	0.87
The Perceived Parent and Peer Approval of Sex Questionnaire (2 items)	The questionnaire consists of two items measuring the perception of the agreement to sexual behaviors among adolescents from parents and friends. Responses were measured on a 4-point Likert scale. The score ranged from 2–8, where 6–8, 4–5, and 2–3 meant high, medium, and low perceived parent and peer approval of sex, respectively.	How strongly do you agree that your parents approve of sex?  How strongly do you agree that your friends approve of sex?	2–6	$\alpha$	0.84	0.80



**Table 1.** Instrument description, example of items, possible range score, and reliability of instruments in the actual study (Cont.)

Instrument and number of items	Description	Example item	Possible range score	Reliability		
				Type	Pre-test (n = 30)	Actual study (n = 700)
The Perceived Peer Norms (12 items)	The questionnaire consists of 12 items that showed the influence of the sexual risk behaviors of adolescents' friends. These questions were on a 5-point ordinal scale ranging from 12-60. Scores of 41-60, 22-40, and 12-21 mean high, medium, and low perceived peer norms, respectively.	How strongly do you have any friends who use the internet to find love?	0-48	$\alpha$	0.76	0.80
The Neighborhood Disorganization Questionnaire (10 items)	The questionnaire was about the perception of risk in the community related to sexual risk behaviors, namely drug use, sex work, rape, substance abuse, and adolescent mothers in the community. The scores were defined as 31-40, 21-30, and 10-20 mean high, medium, and mild neighborhood disorganization, respectively.	Is there any sexual harassment or rape in the community?	10-40	$\alpha$	0.88	0.92
The Neighborhood social control Questionnaire (2 items)	The questionnaire was about how neighbors would intervene in risky situations. The meaning of the scores was given as 7-8, 5-6, and 2-4 mean high, medium, and mild neighborhood control, respectively.	Is it possible for neighbors to control adolescents who skip the school?	2-8	$\alpha$	0.80	0.82
The Neighborhood social cohesion Questionnaire (5 items)	The questionnaire was about environmental items and trust among neighbors. The meaning of the scores was given as 16-20, 11-15, and 5-10 mean high, medium, and mild neighborhood cohesion, respectively.	How strongly do you agree that people in this community are willing to help every adolescent?	5-20	$\alpha$	0.87	0.84
The Culture Norms Questionnaire (5 items)	The questionnaire presented adolescents' perceptions to the community members about having boyfriends/girlfriends and having sexual intercourse with boys/girls, communication about sex, premarital sex, and whether girls should keep their virginity. The meaning of the scores was given as 19-24, 13-18, and 6-12 mean high, medium, and mild culture norms, respectively. Those items in all measures are on a 4-point ordinal scale.	How strongly do you agree that people in the community think it's normal for adolescents to have a boyfriend or girlfriend?	6-24	$\alpha$	0.85	0.81

**KR 20 = Kuder-Richardson Formula 20, N/A = Not available**

# ปัจจัยทำนายพฤติกรรมก่อนมีเพศสัมพันธ์และพฤติกรรมทางเพศของวัยรุ่นไทยมุสลิม: การศึกษาภาคตัดขวาง

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**บทคัดย่อ:** พฤติกรรมก่อนมีเพศสัมพันธ์และพฤติกรรมทางเพศนั้นถือเป็นความเสี่ยงและอาจทำให้วัยรุ่นต้องเผชิญกับการตั้งครรภ์ที่ไม่พึงประสงค์และการติดเชื้อทางเพศสัมพันธ์ในอัตราสูงชัน การศึกษาแบบภาคตัดขวางนี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยที่อธิบายพฤติกรรมเสี่ยงทางเพศของวัยรุ่นมุสลิมภาคใต้สุดของประเทศไทย วัยรุ่นจำนวน 700 คนที่เข้าร่วมการศึกษานี้มาจากวิทยาลัยอาชีวศึกษาและโรงเรียน 4 แห่งมีการใช้แบบสอบถามพฤติกรรมเสี่ยงทางเพศและปัจจัยที่เกี่ยวข้องกับพฤติกรรมเสี่ยงทางเพศในการเก็บรวบรวมข้อมูล ใช้สถิติเชิงพรรณนาสำหรับการอธิบายลักษณะของอาสาสมัคร ใช้สถิติการถดถอยแบบโลจิสติกแบบไบนารีในการตรวจสอบปัจจัยทำนายพฤติกรรมเสี่ยงทางเพศ

ผลการวิจัยพบว่าอายุที่เพิ่มขึ้นเป็นปัจจัยทำนายของพฤติกรรมก่อนมีเพศสัมพันธ์และพฤติกรรมทางเพศที่สูงขึ้น ปัจจัยด้านความสัมพันธ์ระหว่างบุคคลเผยพบว่าความรู้เรื่องพฤติกรรมเสี่ยงทางเพศเป็นปัจจัยป้องกัน ในขณะที่การรับรู้การยอมรับการมีเพศสัมพันธ์ของผู้ปกครองและเพื่อน และการรับรู้บรรทัดฐานของเพื่อนเป็นปัจจัยทำนายสำหรับพฤติกรรมก่อนมีเพศสัมพันธ์และพฤติกรรมทางเพศที่สูงขึ้นตามลำดับ ในขณะที่การเฝ้าติดตามจากผู้ปกครองที่มากขึ้นเป็นปัจจัยป้องกันต่อพฤติกรรมก่อนมีเพศสัมพันธ์ให้ลดลงได้ ปัจจัยด้านสิ่งแวดล้อมพบว่าบรรทัดฐานทางวัฒนธรรมเป็นปัจจัยป้องกันที่สำคัญ ในขณะที่การขาดการระแวดระวังจากเพื่อนบ้านเป็นปัจจัยทำนายของพฤติกรรมก่อนมีเพศสัมพันธ์ที่สูงขึ้น โดยสรุปแล้วปัจจัยด้านอายุ การรับรู้การยอมรับการมีเพศสัมพันธ์ของผู้ปกครองและเพื่อน การรับรู้บรรทัดฐานของเพื่อนเป็นปัจจัยทำนายทั้งพฤติกรรมก่อนมีเพศสัมพันธ์และพฤติกรรมทางเพศ ผลจากการศึกษานี้ให้ข้อมูลที่เป็ประโยชน์สำหรับผู้ให้บริการด้านสุขภาพ โดยเฉพาะอย่างยิ่งพยาบาลที่ต้องพัฒนานวัตกรรมโดยอาศัยปัจจัยป้องกันและปัจจัยทำนายของพฤติกรรมเสี่ยงทางเพศนี้ ผู้วิจัยจึงขอแนะนำการวิจัยเชิงปฏิบัติการที่มีผู้มีส่วนได้ส่วนเสียทั้งหมดในชุมชนในการพัฒนานวัตกรรมการป้องกันพฤติกรรมเสี่ยงทางเพศในวัยรุ่นมุสลิม

*Pacific Rim Int J Nurs Res 2024; 28(1) 116-131*

**คำสำคัญ:** วัยรุ่น มุสลิม พฤติกรรมก่อนมีเพศสัมพันธ์ พฤติกรรมเสี่ยงทางเพศ ภาคใต้ของประเทศไทย

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