Journal of Holistic Nursing and Midwifery

January 2026, Volume 36, Number 1

Original Paper

Predictive Factors of Safe Sexual Behaviors Among Adolescents in Thailand

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Citation Tunthanathip S, Laeheem K. Predictive Factors of Safe Sexual Behaviors Among Adolescents in Thailand. J Holist Nurs Midwifery. 2026; 36(1):1-8. https://doi.org/10.32598/jhnm.36.1.2673

Running Title Sexual Behaviors Among Thai Adolescents

https://doi.org/10.32598/jhnm.36.1.2673

Article info:

Received: 01/05/2025

Accepted: 24/09/2025

Available Online: 01/01/2026

Keywords:

Sexually transmitted diseases (STDs), Risky behaviors, Attitude, Counseling

ABSTRACT

Introduction: Sexually transmitted diseases (STDs) in adolescents are one of the major public health problems. The incidence of STDs has gradually increased in Thailand, which can be related to risky sexual behaviors.

Objective: This study aimed to identify predictors of safe sexual behaviors among adolescents in Songkhla Province, Thailand.

Materials and Methods: This is a cross-sectional survey study, conducted on 255 school and college students aged 15-24 years in Southern Thailand from November 2022 to January 2023, who were selected using a convenience sampling method. An online questionnaire was used to collect data measuring safe sexual practice with three domains: Knowledge, attitude, and counseling about STDs. The collected data were analyzed using Pearson's correlation test and linear logistic regression analysis. $P<0.05$ was considered statistically significant.

Results: The mean age of the participants was 18.05±1.19 years; 52.5% were female, and almost all were single. The knowledge score did not have a significant correlation with other variables, while scores of attitudes towards STD prevention ($r=0.54$, $P=0.001$) and attitudes towards correct condom use ($r=0.55$, $P=0.001$) had a positive and significant correlation with the score of counselling about STDs. The final multiple regression model showed that the predictors of safe sexual behaviors were: Attitude to STD patients score (β=2.24, 95% CI; 1.28%, 3.20%, $P=0.001$), counseling about STDs with healthcare personnel (β=2.75, 95% CI; 1.63%, 3.87%, $P=0.001$), and counseling about STD with social media (β=1.74, 95% CI; 0.76%, 2.73%, $P=0.001$). The adjusted R^2 value was 0.501

Conclusion: To reduce the risks of STDs in Thai adolescents, the implementation of safe sexual practices is required by educating and counseling them about safe sexual behaviors via social media platforms or by healthcare personnel.

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Highlights

- One of the main public health concerns is the increase in STDs among adolescents.
- The number of STDs in Thailand has gradually increased, possibly due to unsafe sexual practices.
- Attitude towards STDs patients can predict safe sexual practices among adolescents.
- Counseling about STDs with healthcare personnel and information from social media can predict safe sexual practices among adolescents.

Plain Language Summary

Sexually transmitted diseases (STDs) in adolescents are one of the most important public health problems. The number of STDs in Thailand is gradually increasing, which can be because teens are engaging in risky sexual behaviors. The present study aimed to survey the knowledge, attitude, and counseling about STDs and assess their association with safe sexual practices among Thai adolescents. It was found that their attitudes towards STD patients, their counseling with medical professionals about STDs, and their use of social media information about STDs can predict their behaviors in STD prevention.

Introduction

Sexually transmitted diseases (STDs) in adolescents have become an important public health concern due to socioeconomic and cultural changes. The increasing focus on the sexual health of adolescents is needed to assess their exposure to STDs. According to the Centers for Disease Control and Prevention (CDC), approximately 50% of new STD cases are between the ages of 15-24 [1]. Syphilis, gonorrhea, chlamydia, and trichomoniasis are the most common STDs currently. Therefore, the World Health Organization (WHO) established goals for a 90% decrease in syphilis and gonorrhea incidence between 2018 and 2030 [2]. Risky sexual behaviors can impair people's health, particularly their sexual health, by increasing their susceptibility to STDs and unwanted pregnancy [2, 3]. A study in Brazil showed that the incidence of acquired syphilis increased significantly from 12.3 cases per 100,000 population in 2011 to 81.4 cases per 100,000 population in 2017 [3], while the incidence rate of active syphilis in Colombia was 300 cases per 100,000 population in 2016 [4]. According to Thai national data, the incidence of STDs decreased from 1985 to 2005 but gradually increased since 2005. Syphilis and gonorrhea were the most common STDs, with incidence rates of 8.2 and 15.8 cases per 100,000 population, respectively. The increased incidence of STDs can be related to decreased condom use and increased risky sexual practices [5]. Hence, it is necessary to identify risk factors to increase safe sexual behaviors.

Knowledge, attitude, and practice regarding condom use in adolescents are important. Anyanwu et al. surveyed the knowledge and attitude of adolescents in Nigeria regarding condom use and found that knowledge and attitude are essential factors for sexual preventive practice. A negative attitude towards the use of condoms increased the refusal of condom use. In addition, errors in using condoms were common because of a lack of knowledge of the correct use of condoms [6]. Nesidai et al. studied factors associated with condom use among undergraduate students aged 15-24 years in Kenya and found a significant relationship between condom use and general attitude [7]. Yosef et al. studied 453 college students in southwest Ethiopia and reported that knowledge of STDs was significantly associated with a positive attitude towards condom use [8]. A study on homosexual men in Songkhla Province, Thailand, found that 87.5% and 94.6% of all cases had good knowledge and positive attitudes, respectively, while 62.5% had good behavior in STD prevention [9]. Lack of STD counseling can lead to misunderstanding and poor perception of safe sexual behaviors in students and young adults. Cohen et al. used a short group discussion, a role-playing session, and multimedia presentation during group counseling to promote safe sex behaviors that could reduce the re-infection rate among males [10]. However, seeking sexual information and counseling in Thailand is challenging among different socioeconomic and cultural contexts due to STD/AIDS-related social stigma [11].

Based on the literature review, various factors associated with safe sexual behaviors include good knowledge, positive attitude, and counseling. An investigation is required to determine whether these factors are related to safe sexual practice in Thailand, where there are higher incidence rates of STDs. Therefore, the present study aimed to identify predictors of safe sexual behaviors or practices among adolescents in Songkhla Province, Thailand.

Materials and Methods

This is a cross-sectional survey study conducted from November 2022 to January 2023. The study population was adolescents aged 15-24 years from two schools and one college in Southern Thailand. The sample size was determined using Cochran formula [12]. Based on data from Ampawa [9], the proportion of perceived self-protection in sexual intercourse was 87.5%. Using this value and considering a 0.05 margin of error and a 95% confidence interval, the minimum required sample size was calculated to be 169. Participants were invited via email sent to two schools and one college in Songkla Province, each with more than 1,000 students. There were 260 responses from students, of whom 255 were accepted to participate in the study and complete the questionnaires. Participants were selected by using a convenience sampling method.

The data were collected by a self-administered questionnaire measuring safe sexual practice, with two sections. The first section surveyed the baseline characteristics of participants, and the second section measured knowledge, attitude, counseling, assessed by three specialist physicians. The knowledge subscale had two domains; the attitude subscale, three domains; and counseling subscale, two domains. Each item was rated on a scale from 0 to 5. The quantitative content validity of this questionnaire was assessed using the item-objective congruence index by three physicians, yielding a value of 0.936. In addition, the questionnaire was used in a pilot study to determine its internal consistency. The Cronbach's α coefficient for the overall scale was obtained at 0.925. For the knowledge, attitude, and counselling subscales, it was 0.884, 0.855, and 0.959, respectively.

Continuous variables were described as frequencies (percentages), while the Mean±SD were used for continuous variables. The Pearson correlation test and linear regression analysis were used to identify the factors associated with safe sexual practices. P<0.05 was considered statistically significant. Statistical analyses were performed in R software, version 4.1.0.

Results

The baseline characteristics of the participants are shown in Table 1. The mean age of the participants was 18.05±1.19 years. Among participants, 52.5% were female, and almost all were single. Also, 43.9% were high school students and 56.1% were college students. All of the participants had sexual experiences; 47.1% had multi-partner relationships, and 48.0% had experienced sexual intercourse in a brothel. In terms of safe sexual practice, 67.4% always had safe sexual behavior. In detail more than half had multiple sexual partners and 42.7% had experienced of one-night relationship. More than half of the participants had experienced anal sexual intercourse, while just 46.3% always used condom usage.

Mean scores of knowledge, attitude, and counseling domains for measuring safe sexual practices are shown in Table 2. In the knowledge domain, the mean score of STD prevention was 2.82±1.09, whereas the STD infection score was 3.4±1.32. Mean scores of attitudes towards STD patients, STD prevention, and correct condom use were 3.1±0.84, 3.51±0.91, and 3.71±1.03, respectively. In the counseling domain, mean scores of counseling about STDs with healthcare personnel and social media were 4.05±1.08 and 3.81±1.16. The total safe sexual practice score was 3.77±1.19.

Pearson's correlation coefficients for the relationship between demographic variables and the variables of knowledge, attitude, counseling, and safe sexual practice are shown in Table 3. The knowledge domain score did not have a significant correlation with other variables, while scores of attitudes towards STD prevention (r=0.54, P=0.001) and attitudes towards correct condom use (r=0.55, P=0.001) were positively related with the score of counselling from healthcare personnel.

The results of linear regression analysis are shown in Table 4. The knowledge, attitude, and counseling had significant association with safe sexual practice, while demographic data were not significantly associated with safe sexual practice scores. The knowledge of STD prevention (β=1.99, P=0.001) and STD infection (β=1.78, P=0.001); the attitude towards STD patients (β=4.88, P=0.001), STD prevention (β=4.79, P=0.001), and correct condom use (β=3.85, P=0.001); and counselling with healthcare personnel (β=5.11, P=0.001) and social media (β=4.4, P=0.001) had significant association with safe sexual practice. Therefore, these factors were in-

Table 1. Baseline characteristic of the study population (n=255)

Characteristics		No. (%)/Mean±SD
Gender	Male	121(47.5)
	Female	134(52.5)
	Age (y)	18.05±1.19
Marital status	Single	254(99.6)
	Married	1(0.4)
Educational level	High school	112(43.9)
	Bachelor's degree	143(56.1)
Frequency of safe sexual practice	History of sexual experience	255(100)
	Never	0(0)
	Sometime	83(32.6)
	Always	172(67.4)
Safe sexual practices	Multiple sexual partners	105(52.9)
	One-night sexual relationship	79(42.7)
	Sexual experience in a brothel	108(48)
	Using drugs before sexual intercourse	90(47.1)
	Experience of anal sexual intercourse	98(50.2)
	Experience while using condom	88(46.3)
	Checking condom packaging for any damage before usage	116(57.3)

Table 2. Knowledge, attitude, and counseling domains and safe sexual practice and the correlation coefficients between them (n=255)

Domain		Mean±SD	95% CI (Lower-Upper)	r	P*
Knowledge	STD prevention (item 1)	2.82±1.09	0.26, 0.37	0.261	0.001
	STD infection (item 2)	3.4±1.32	0.16, 0.39	0.283	0.001
Attitude	STD patients (item 3)	3.1±0.84	0.41, 0.59	0.512	0.001
	STD prevention (item 4)	3.51±0.91	0.42, 0.6	0.523	0.001
	Correct condom use (item 5)	3.71±1.03	0.37, 0.56	0.476	0.001
Counseling	Counselling about STDs with healthcare personnel (item 6)	4.05±1.08	0.58, 0.72	0.662	0.001
	Counselling about STD with social media (item 7)	3.81±1.16	0.53, 0.68	0.616	0.001
Total	Safe sexual practice score	3.77±1.19		-	-

SD: Standard deviation, STD: Sexually transmitted disease.

*Pearson's correlation test.

Table 3. Pearson' correlation matrix

Variables	Gender	Age	Marital status	Education	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Total
Gender	1											
Age	r=0.09 P=0.13	1										
Marital status	r=0.06 P=0.29	r=-0.05 P=0.37	1									
Education	r=0.07 P=0.22	r=0.64 P=0.001	r=-0.07 P=0.25	1								
Item 1	r=-0.18 P=0.004	r=-0.21 P=0.05	r=-0.04 P=0.42	r=-0.19 P=0.06	1							
Item 2	r=-0.11 P=0.06	r=-0.1 P=0.10	r=0.009 P=0.88	r=-0.07 P=0.21	r=0.72 P=0.001	1						
Item 3	r=0.02 P=0.75	r=0.17 P=0.06	r=-0.13, P=0.02	r=0.25 P=0.05	r=0.29 P=0.001	r=0.3 P=0.001	1					
Item 4	r=-0.03 P=0.61	r=0.04 P=0.47	r=-0.08, P=0.16	r=0.07 P=0.23	r=0.53 P=0.001	r=0.52 P=0.001	r=0.5 P=0.001	1				
Item 5	r=-0.06 P=0.33	r=0.03 P=0.60	r=-0.05 P=0.34	r=0.06 P=0.31	r=0.37 P=0.001	r=0.34 P=0.001	r=0.46 P=0.001	r=0.67 P=0.001	1			
Item 6	r=0.02 P=0.69	r=0.18 P=0.21	r=-0.08 P=0.17	r=0.26 P=0.04	r=0.18 P=0.001	r=0.18 P=0.001	r=0.49 P=0.001	r=0.54 P=0.001	r=0.55 P=0.001	1		
Item 7	r=-0.01 P=0.76	r=0.12 P=0.42	r=-0.06 P=0.22	r=0.17 P=0.02	r=0.28 P=0.001	r=0.31 P=0.001	r=0.40 P=0.001	r=0.53 P=0.001	r=0.5 P=0.001	r=0.77 P=0.001	1	
Total	r=-0.11 P=0.86	r=0.04 P=0.45	r=-0.07 P=0.21	r=0.15 P=0.05	r=0.26, P=0.001	r=0.28 P=0.001	r=0.51, P=0.001	r=0.52 P=0.001	r=0.47, P=0.001	r=0.66 P=0.001	r=0.61 P=0.001	1

cluded in the multiple regression model (Table 5). The attitude towards STD patients (β=2.24, 95% CI; 1.28%, 3.20%, P=0.001), counseling about STD with healthcare personnel (β=2.75, 95% CI; 1.63%, 3.87%, P=0.001), and counseling about STD with social media (β=1.74, 95% CI; 0.76%, 2.73%, P=0.001) were significant predictors of safe sexual practice.

Discussion

In the present study, it was found that attitudes towards STD patients, counseling about STDs with healthcare personnel, and receiving information/counseling about STDs from social media were significant positive predictors of STD prevention behaviors among Tai adolescents, which is consistent with the results of previous studies [5-8]. According to other studies, for identifying factors related to safe sexual practice among adolescents, their knowledge, attitude, and source of health information should be surveyed [5-11]. In our study, all three domains had a significant correlation with safe sexual practice, with the attitude and counseling domains showing greater correlation. Attitudes towards STD patients and counseling about STDs with healthcare personnel or receiving information from social media are important for having a safe sexual practice. Negative or positive attitudes can affect sexual practices. In the present study, clinical features and presentation of STDs can strongly affect the attitude of adolescents towards using a condom to have safe sex behaviors, since STD patients suffer from symptoms and social stigma. Nesidai et al. [7] surveyed adolescents in Kenya and found that a positive attitude towards condom use was associated with their use of condoms. In addition, knowledge, information/counseling of STDs and safe sexual behaviors were reported to be associated with safe sexual practice [6, 8].

The present study found risky sexual behaviors, which highlight the issue of sexual health among Tai adolescents. These results are similar to those reported in previous studies [13-15]. The rate of high-risk sexual behaviors in our study is close to that in previous studies conducted in Thailand. Somrongthong et al. studied sexual behaviors among teenagers in Bangkok and found that two-thirds of the adolescents engaged in unprotected sexual intercourse because they believed that having sexual intercourse with a partner was acceptable [16]. More than half of the participants in our study had multiple sexual partners. These findings are comparable with those of prior studies, which showed a rise in having multiple sexual partners [17, 18]. This can be explained by changes in social culture and current sexual norms across several countries [18, 19].

Table 4. Linear regression coefficients for factors associated with safe sexual practice

Model		Beta Coefficient	S.E.	T	95% CI (Lower, Upper)	P
Gender (female)		-0.17	1.04	-0.16	-2.24, 1.89	0.864
Marital status (married)		-10.45	8.35	-1.25	-26.91, 6.01	0.210
Education (bachelor's degree)		2.59	1.04	2.49	0.54, 4.65	0.012
Age (y)		0.33	0.43	0.75	-0.53, 1.19	0.453
Knowledge domain	STD prevention	1.99	0.46	4.2	0.98, 4.33	0.001
	STD infection	1.78	0.37	4.69	1.16, 2.61	0.001
Attitude domain	STD patients	4.88	0.51	9.47	2.24, 6.97	0.001
	STD prevention	4.79	0.49	9.76	1.57, 5.75	0.001
	Correct condom use	3.85	0.44	8.59	2.63, 5.78	0.001
Counseling domain	With health personnel	5.11	0.36	14.05	3.42, 7.11	0.001
	With social media	4.4	0.35	12.44	3.14, 5.27	0.001
	Constant	22.5				0.001

Abbreviations: CI: Confidence Interval, S.E: Standard error, STD: Sexual transmitted disease

Providing information and counseling about STDs by parents, teachers, and healthcare personnel is challenged in Thailand due to cultural and social stigma. Tipwareerom et al. [20] studied condom usage among high school students through interviews and found that more than half of parents disagreed with placing condom vending machines in schools to inform the correct condom usage because high school students were too young to learn sexual topics. They perceived that counseling about the proper condom usage can promote students' sexual experiences [20, 21]. Besides counseling with health personnel, the present study found that receiving information from social media had a high impact on adolescents' safe sexual behaviors, which is in agreement with those of previous studies. Muanjan et al. studied social media addiction among high school students in Thailand and found that 15.7% of students were completely addicted to social media, while 51.3% were almost addicted regarding the use of social media, most of them used Instagram and Facebook 5.29 hours on weekday and 8.38 hours on weekend [22]. When Thai adolescents' behavior is influenced by social media, positive information and counseling about sexual problems may be one of the ways to inform them about the safety of sexual behaviors. Narkarat et al. presented a social media model to improve sexual health literacy among female students and reported that the intervention group's average sexual health literacy score

Table 5. Multiple regression coefficients for factors associated with safe sexual practice

Model	β	S.E.	95% CI Lower, Upper	P
Constant	1.63			0.312
Attitude towards STD patients	2.24	0.48	1.28, 3.20	0.001
Counselling about STD with healthcare personnel	2.75	0.56	1.63, 3.87	0.001
Counselling about STD with social media	1.74	0.49	0.76, 2.73	0.001

Abbreviations: CI: Confidence interval; S.E: Standard error; STD: Sexual transmitted disease.

Note: Multiple linear regression model was as follows: 2.243+2.751+1.746+1.635; R^2=0.507, adjusted R^2=0.501.

increased significantly compared to the control group [23]. Burns et al. conducted in-depth group interviews with African American adolescents regarding condom use and social media preferences. They reported that social media was predominantly utilized for the following purposes: Education, entertainment, browsing the site, self-expression, maintaining or seeking out relationships with family and friends, and social justice [24]. Condom-use education on social media platforms can be engaging if delivered by a well-known community member or a celebrity [25, 26]. In the future, it will be challenging to educate adolescents about safety in sexual relations via social media [25, 26].

In conclusion, attitude and counseling can predict safe sexual behavior among adolescents. However, this study had some limitations. We used a cross-sectional design over 3 months. By extending the duration and increasing the number of samples from other regions of Thailand and institutions, it is possible to obtain more information from adolescents. Further study should be conducted to improve safe sexual practices among Thai adolescents. Moreover, challenges of sexual health education and counseling for adolescents via social media platforms should be investigated.

Ethical Considerations

Compliance with ethical guidelines

The study was approved by the Ethics Review Committee of the Faculty of Nursing, Prince of Songkla University, Hat Yai, Thailand (Code: PSU IRB 2020-PSU-st010). The study objectives and methods were explained to the participants, and their written informed consent was obtained. All ethical principles were observed throughout the study.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for profit sectors.

Authors' contributions

Conceptualization, study design, review and editing: All authors: Data collection: Kasetchai Laeheem; Participant recruitment, data curation, data analysis, and initial draft preparation: Sopista Tunthanathip; Project administration: Kasetchai Laeheem.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgments

The authors would like to thank the patients who participated in the research for their cooperation.

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