

## FACTORS ASSOCIATED WITH KNOWLEDGE AND ATTITUDES TOWARD SEXUAL AND REPRODUCTIVE HEALTH AMONG HIGH SCHOOL STUDENTS AT TAN LAP HIGH SCHOOL, HANOI

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### ABSTRACT

**Objective:** To identify factors associated with knowledge and attitudes toward sexual and reproductive health among high school students at Tan Lap High School, Hanoi, Vietnam, thereby informing school-based counseling and sexual and reproductive health support for adolescents.

**Methods:** A cross-sectional descriptive study was conducted among 391 students at Tan Lap High School, Hanoi, Vietnam in 2023. Data were collected using a structured self-administered questionnaire through multistage sampling and analyzed using STATA version 16.0. Associations were assessed using the Chi-square test or Fisher's exact test and logistic regression analysis, with a statistical significance level set at  $p < 0.05$ .

**Results:** The proportion of students with adequate knowledge of sexual and reproductive health was 40.2%, whereas 90.0% demonstrated positive attitudes. In multivariable logistic regression analysis, female students were more likely to have adequate knowledge compared to males (AOR = 3.01; 95% CI: 1.82 - 4.99). Students who discussed sexual and reproductive health had higher odds of adequate knowledge (AOR = 4.61; 95% CI: 2.85 - 7.45). Students whose fathers were employed in the public sector also had higher odds of adequate knowledge (AOR = 4.11; 95% CI: 1.85 - 9.12). In univariable analysis, adequate knowledge (OR = 9.33; 95% CI: 2.82 - 30.88), being female (OR = 2.86; 95% CI: 1.40 - 5.83) and discussion about sexual and reproductive health (OR = 2.20; 95% CI: 1.04 - 4.66) were significantly associated with positive attitudes.

**Conclusion:** Knowledge of sexual and reproductive health among high school students remained limited, despite generally positive attitudes. These findings highlight the need to strengthen school-based sexual and reproductive health education and counseling, with involvement of school health staff, primary care providers, and adolescent health counseling services to identify students' needs and facilitate timely access to appropriate support.

**Keywords:** knowledge, attitudes, sexual and reproductive health, high school students, associated factors.

### I. INTRODUCTION

Adolescence is a critical stage in an individual's life, during which young people gradually become independent, establish new relationships, develop social skills, and form behaviors that may have

long-term consequences [1]. In recent years, adolescents have been increasingly exposed at an earlier age to information and issues related to sexuality and sexual and reproductive health (SRH), while their ability to critically evaluate

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Received: 12/02/2026. Revised: 15/4/2026. Accepted: 13/5/2026.

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information and make safe decisions remains limited [2]. This situation may increase the risk of unintended pregnancy and sexually transmitted infections (STIs), adversely affecting adolescents' health, educational attainment, and overall quality of life [3,4]. From the perspective of adolescent health care, inadequate SRH knowledge may delay the recognition of health-related risks, discourage or postpone seeking professional counseling, and limit timely access to appropriate health services. Consequently, adolescents may miss opportunities for early prevention, counseling, and intervention.

Knowledge and attitudes toward SRH are considered fundamental determinants of safe behaviors among adolescents. Adequate knowledge enables students to correctly understand physical development, SRH-related risks, and appropriate preventive measures. Positive attitudes, in turn, contribute to the promotion of health-protective behaviors and the appropriate use of SRH services. Therefore, assessing students' knowledge and attitudes toward SRH is relevant not only to school-based health education but also to the early identification of students who may need counseling, support, or referral to school health staff and adolescent-friendly health services.

Adolescents are a vulnerable group that is highly susceptible to influences from their surrounding environment, including family, school, peers and mass media channels [5]. Previous studies have shown that individual factors (such as gender, age, and academic performance), family-related factors (living arrangements and the level of communication with parents), as well as social and educational factors (access to information, the role of school-based education and support from teachers and healthcare workers) may affect students' knowledge and attitudes toward SRH [6-8]. Identifying these associated factors may help guide targeted health communication, counseling, and screening for support needs among specific student groups, rather than relying solely on general educational interventions for all students.

Tan Lap High School is located in a peri-urban area of Hanoi, Vietnam, which is undergoing rapid

urbanization and socioeconomic development. Rapid changes in living conditions, the social environment, and access to information in this area may substantially influence students' perceptions and attitudes toward SRH. Based on this context, the present study was conducted to identify factors associated with knowledge and attitudes toward SRH among students at Tan Lap High School, Hanoi, Vietnam, thereby providing scientific evidence to inform the development and implementation of school-based education, counseling, early identification of support needs, and appropriate referral pathways for adolescent sexual and reproductive health care at the local level.

## **II. MATERIALS AND METHODS**

### **2.1. Study participants**

The study population consisted of students in grades 10, 11, and 12 who were enrolled at Tan Lap High School, Dan Phuong District (currently part of O Dien Commune), Hanoi, Vietnam.

Inclusion criteria: Students who were present at the time of the survey agreed to participate in the study.

Exclusion criteria: Students with limited reading or comprehension ability, or those who were unable to self-complete the questionnaire or completed less than 80% of the total number of questions.

### **2.2. Study period and setting**

Study period: From December 2022 to May 2023.

Data collection period: February 2023.

Study setting: Tan Lap High School, Hanoi, Vietnam.

### **2.3. Study design**

A cross-sectional descriptive study.

### **2.4. Sample size and sampling**

Sample size: The sample size was calculated using the formula for estimating a population proportion:

$$n = \frac{Z_{1-\alpha/2}^2 \cdot p \cdot (1-p)}{d^2}$$

Where:

- n is the minimum required sample size.

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- $Z_{1-\alpha/2}$  is the confidence coefficient corresponding to a significance level of  $\alpha = 0.05$ .

- $d$  is the allowable margin of error, set at 0.05.

- $p$  is the proportion of students with adequate knowledge of sexual and reproductive health, set at 0.53 based on a study by Pham Thi Ngoc et al. conducted at Phan Dang Luu High School, Hai Phong, 2019 [9].

The calculated minimum sample size was 382 students. In practice, a total of 391 students were included in the study.

**Sampling method:** A multistage sampling technique was applied. In the first stage, the three grade levels (grades 10, 11, and 12) were included. In the second stage, three classes from each grade were selected using simple random sampling from the official class lists, resulting in a total of nine classes. In the final stage, all students in the selected classes were invited to participate in the study.

### **2.5. Data collection methods and study variables**

- Data were collected using a structured self-administered questionnaire, with initial guidance provided by trained investigators. The questionnaire was developed and adapted to align with the study objectives, with reference to the study by Ho Thi Ha, and comprised sections on general characteristics, knowledge, and attitudes toward sexual and reproductive health [7].

- **Study variables:** The dependent variables were knowledge and attitudes toward sexual and reproductive health. Knowledge was measured using 20 items (B1-B20) and attitudes were assessed using 11 items (C1-C11). Both variables were categorized based on predefined cutoff points.

Independent variables included general characteristics of the participants (16 items, A1-A16), such as sex, grade level, academic performance, living arrangement, birth order, parental occupation, parental education level, and whether participants had discussions about sexual and reproductive health.

- **Assessment criteria:** For knowledge, each correct answer was assigned 1 point; the maximum

total score for the knowledge section was 53 points. Attitudes were assessed using a 5-point Likert scale, with scores ranging from 1 to 5 for each item, yielding a maximum total score of 55 points. Based on the study by Ho Thi Ha, a cutoff point of 70% of the total score was applied for classification; accordingly, knowledge was classified as adequate when the total score was  $\geq 37$ , and attitudes were classified as positive when the total score was  $\geq 38$  [7].

- Internal consistency was assessed using Cronbach's alpha. The knowledge scale demonstrated excellent reliability ( $\alpha = 0.94$ ), while the attitude scale showed good reliability ( $\alpha = 0.83$ ).

### **2.6. Data processing and statistical analysis**

Data were cleaned and entered using KoboToolbox software and subsequently analyzed using STATA version 16.0. Associations between variables were examined using the  $\chi^2$  test or Fisher's exact test, as appropriate. Statistical significance was defined as  $p < 0.05$ ; odds ratios (ORs) and 95% confidence intervals (95% CIs) were calculated to assess the strength of associations. Variables with  $p < 0.20$  in univariable analysis or those considered theoretically relevant were included in the multivariable logistic regression model.

### **2.7. Ethical considerations**

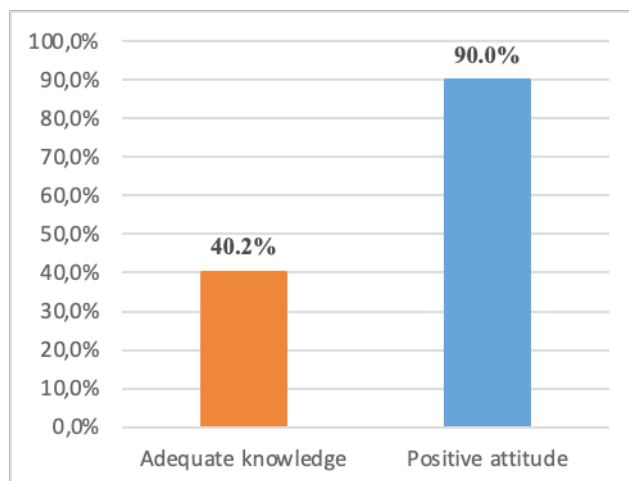
The study adhered to ethical principles in medical research. The study protocol was approved by the Thesis Proposal Review Committee of Hanoi Medical University. Permission to conduct the study was obtained from the school administration, and informed consent was obtained from all participating students.

## **III. RESULTS**

### **3.1. Assessment of knowledge and attitudes toward sexual and reproductive health**

Among the 391 students at Tan Lap High School who participated in the study, the proportion of students with adequate knowledge of sexual and reproductive health was 40.2% (157 students), while 90.0% (352 students) demonstrated positive attitudes (Figure 1).

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**Figure 1:** Assessment of knowledge and attitudes toward sexual and reproductive health.

**3.2. Factors associated with knowledge of sexual and reproductive health among students**

The results showed that students’ knowledge of sexual and reproductive health (SRH) was significantly associated with several individual and family-related factors. Specifically, female students, those with good academic performance, first-born students, students whose fathers were employed in the public sector, and those who reported communication about SRH were more likely to have adequate knowledge compared with the respective reference groups. In contrast, grade level and mother’s occupation were not significantly associated with SRH knowledge ( $p > 0.05$ ) (Table 1).

**Table 1:** Univariable analysis of factors associated with knowledge of sexual and reproductive health among students (n = 391).

Characteristics	Overall knowledge		OR (95% CI)	p-value
	Adequate (%)	Inadequate (%)		
Gender				
Female	100 (47.8)	109 (52.2)	2.01 (1.33 - 3.05)	0.001
Male*	57 (31.3)	125 (68.7)		
Grade level				
Grade 10*	59 (41.3)	84 (58.7)	1.00	
Grade 11	54 (42.2)	74 (57.8)	1.04 (0.63 - 1.76)	0.890
Grade 12	44 (36.7)	76 (63.3)	0.82 (0.49 - 1.39)	0.460
Academic performance				
Non-excellent students*	85 (35.6)	154 (64.4)	1.58 (1.06 - 2.38)	0.005
Excellent	72 (47.1)	80 (52.9)		
Birth order				
First-born	84 (45.7)	100 (54.3)	1.54 (1.03 - 2.32)	0.047
Later-born*	73 (35.3)	134 (64.7)		

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Characteristics	Overall knowledge		OR (95% CI)	p-value
	Adequate (%)	Inadequate (%)		
Father's occupation				
Public sector	38 (63.3)	22 (36.7)	3.08 (1.74 - 5.45)	< 0.001
Non-public sector*	119 (36.0)	212 (64.0)		
Mother's occupation				
Public sector	45 (47.9)	49 (52.1)	1.52 (0.95 - 2.42)	0.080
Non-public sector*	112 (37.7)	185 (62.3)		
Communication on SRH				
Yes	98 (60.5)	64 (39.5)	4.41 (2.86 - 6.80)	< 0.001
No*	59 (25.8)	170 (74.2)		

\*Reference category.

After including variables that were significant in the univariable analysis into the multivariable logistic regression model, gender, father's occupation, and communication about sexual and reproductive health remained statistically significant. Specifically, female students had 3.01 times higher odds of having adequate knowledge compared with male students (95% CI: 1.82-4.99). Students whose fathers were employed in the public sector had 4.11 times higher odds of having adequate knowledge (95% CI: 1.85-9.12), and students who reported communication about sexual and reproductive health had 4.61 times higher odds of having adequate knowledge compared with the reference group (95% CI: 2.85-7.45) (Table 2).

**Table 2:** Multivariable logistic regression analysis of factors associated with knowledge of sexual and reproductive health among students (n = 391)

Factors	AOR	95% CI	p-value
Female gender	3.01	1.82 - 4.99	< 0.001
Grade 11	0.91	0.52 - 1.58	0.731
Grade 12	0.86	0.48 - 1.54	0.623
Excellent academic performance	1.39	0.86 - 2.27	0.179
First-born	1.25	0.78 - 1.98	0.352
Father employed in the public sector	4.11	1.85 - 9.12	< 0.001
Mother employed in the public sector	1.18	0.59 - 2.33	0.644
Communication about SRH	4.61	2.85 - 7.45	< 0.001

### 3.3. Factors associated with attitudes toward sexual and reproductive health among students

The results indicated that students' attitudes toward sexual and reproductive health were significantly associated with gender, communication about sexual and reproductive health and overall knowledge level ( $p < 0.05$ ). The remaining factors were not significantly associated ( $p > 0.05$ ) (Table 3).

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**Table 3:** Univariable analysis of factors associated with attitudes toward sexual and reproductive health among students (n = 391)

Characteristics	Overall attitudes		OR (95% CI)	p-value
	Positive (%)	Not positive (%)		
Gender				
Male*	155 (85.2)	27 (14.8)	2.86 (1.40 - 5.83)	0.003
Female	197 (94.3)	12 (5.7)		
Grade level				
Grade 10*	127 (88.8)	16 (11.2)	1.00	
Grade 11	115 (89.8)	13 (10.2)	1.11 (0.51 - 2.42)	0.784
Grade 12	110 (91.7)	10 (8.3)	1.39 (0.60 - 3.18)	0.440
Academic performance				
Non-excellent students*	139 (91.4)	13 (8.6)	0.77 (0.37 - 1.61)	0.486
Excellent	213 (89.1)	26 (10.9)		
Birth order				
First-born	166 (90.2)	18 (9.8)	1.04 (0.54 - 2.02)	0.905
Later-born*	186 (89.9)	21 (10.1)		
Father's occupation				
Public sector	57 (95.0)	3 (5.0)	2.32 (0.69 - 7.79)	0.162
Non-public sector*	295 (89.1)	36 (10.9)		
Mother's occupation				
Public sector	85 (90.4)	9 (9.6)	1.52 (0.95 - 2.42)	0.080
Non-public sector*	267 (89.9)	30 (10.1)		
Communication on SRH				
Yes	152 (93.8)	10 (6.2)	2.20 (1.04 - 4.66)	0.035
No*	200 (87.3)	29 (12.7)		
Overall knowledge				
Adequate	154 (98.1)	3 (1.9)	9.33 (2.82 - 30.88)	< 0.001
Inadequate*	198 (84.6)	36 (15.4)		

\*Reference category

#### **IV. DISCUSSION**

This study was conducted to identify factors associated with knowledge and attitudes toward sexual and reproductive health (SRH) among students at Tan Lap High School in Hanoi, Vietnam. Our findings showed that the proportion of students with adequate knowledge remained relatively limited, whereas attitudes toward SRH were generally positive. These findings are consistent with several studies conducted in different regions of Vietnam, which have reported relatively low levels of knowledge regarding SRH among students, while positive attitudes were predominant [6,7,10,11]. From the perspective of adolescent health care, the limited proportion of students with adequate knowledge deserves attention because inadequate SRH knowledge may delay recognition of risk signs, discourage help-seeking, or postpone access to appropriate counseling and health services. This may increase the likelihood that adolescents miss opportunities for early prevention, counseling, and intervention for problems such as unintended pregnancy, sexually transmitted infections, and other reproductive health concerns. These results provide a basis for further discussion of the associated factors, as well as the implications of the study findings for school-based SRH communication and education activities.

##### **4.1. Factors associated with knowledge of sexual and reproductive health**

Our study identified several individual and family-related factors that were significantly associated with students' knowledge of sexual and reproductive health (SRH). In particular, female students were 3.01 times more likely to have adequate knowledge compared with male students (95% CI: 1.82-4.99). This finding is consistent with the study by Le Thi Viet Trinh conducted in Soc Trang, which reported that female students were 2.08 times more likely to have adequate knowledge than male students (95% CI: 1.35-3.22) [6]. Similarly, a study by Nguyen Ngoc Nghia in Yen Bai also found that female students had 1.85 times higher odds of having adequate knowledge compared with males (95% CI: 1.25-2.78) [8]. This difference may reflect biological characteristics and sociocultural contexts, as females often enter

puberty earlier and tend to be more proactive in seeking information than males. However, this finding also suggests that male students may require greater attention in SRH education and counseling, particularly regarding risk recognition, prevention of sexually transmitted infections, responsibility in safe sexual relationships, and access to reliable counseling sources when health concerns arise. Some other studies have reported that differences in knowledge between the two genders were not clearly evident [7,12].

In addition, father's occupation was identified as a factor significantly associated with students' knowledge. Students whose fathers were employed in the public sector were 4.11 times more likely to have adequate knowledge (95% CI: 1.85-9.12) compared with those whose fathers worked in the non-public sector. This finding is consistent with several international studies, suggesting that father's occupation may reflect the family's socioeconomic status and access to formal information sources, thereby facilitating guidance and provision of SRH-related information to children [13,14].

Furthermore, communication about SRH was found to be strongly associated with students' knowledge. Students who reported frequent communication about SRH were 4.61 times more likely to have adequate knowledge (95% CI: 2.85-7.45) compared with the reference group. This association has also been documented in previous studies, highlighting the important role of communication between students and their families, schools, and official information sources in improving understanding and reducing misconceptions related to reproductive health [6,15]. From an applied perspective, communication may not only improve knowledge but also provide opportunities for students to express concerns, recognize health-related problems early, and be guided toward professional counseling when needed. Therefore, schools should create a safe, confidential, and non-stigmatizing communication environment in which school health staff, homeroom teachers, and counselors can serve as initial points of contact for students with SRH-related concerns.

In contrast, some variables, such as birth order and academic performance, showed significant

associations in univariable analysis but did not retain statistical significance in the multivariable logistic regression model. This finding suggests that the associations observed in univariable analysis may have been influenced by confounding factors and underscores the importance of multivariable analysis in identifying independent factors associated with students' knowledge of SRH.

#### **4.2. Factors associated with attitudes toward sexual and reproductive health**

The study findings indicated that female students were 2.86 times more likely to exhibit positive attitudes toward sexual and reproductive health (SRH) compared with male students (95% CI: 1.40-5.83). This trend has also been reported in several international studies. Such differences may stem from gender-related variations in access to information sources and in the ways males and females express their perspectives on SRH-related issues [16]. Together with the findings on knowledge, this result suggests that male students may benefit from more targeted and acceptable SRH counseling approaches, particularly in school settings where gender norms may affect students' willingness to discuss reproductive health concerns.

In addition, communication about SRH was identified as a factor significantly associated with students' attitudes. Students who reported frequent communication were 2.20 times more likely to develop positive attitudes compared with those who did not engage in such communication (95% CI: 1.04-4.66). Similar findings have been documented in previous studies, suggesting that an open communication environment involving families, schools, and official information sources plays an important role in shaping appropriate perceptions and attitudes toward SRH [17].

Notably, the study revealed a strong association between knowledge and attitudes, whereby students with adequate knowledge were substantially more likely to develop positive attitudes (OR = 9.33; 95% CI: 2.82-30.88). This finding is consistent with the study by Le Thi Viet Trinh conducted in Soc Trang, which reported that students with adequate knowledge were 2.63 times more likely to have positive attitudes compared with the reference group (95% CI: 1.75-3.96) [6]. These findings

are in line with the Knowledge–Attitude–Practice (KAP) model, emphasizing the foundational role of knowledge in shaping attitudes and guiding safe sexual and reproductive health behaviors among students. In practice, improving knowledge may therefore be an important entry point for promoting positive attitudes and encouraging adolescents to seek timely counseling or support when reproductive health concerns arise.

Overall, the findings highlight the need to move beyond general SRH education and toward integrated school-based support that combines health communication, confidential counseling, early identification of students' support needs, and referral to appropriate adolescent-friendly health services. School health staff, counselors, primary care providers, and reproductive health specialists may play complementary roles in detecting students who need further support, providing initial counseling, and facilitating timely referral when necessary.

This study has several limitations. The cross-sectional design does not allow causal inference and self-reported data may be subject to recall and social desirability bias. The study was conducted in a single high school, limiting generalizability. Furthermore, multivariable logistic regression was not performed for attitudes due to the high proportion of positive responses, which reduced statistical power for adjusted analysis.

#### **V. CONCLUSION**

This study found that knowledge of sexual and reproductive health (SRH) among students at Tan Lap High School was relatively limited, whereas attitudes were predominantly positive. Multivariable logistic regression analysis identified gender, father's occupation, and communication about SRH as independent factors associated with students' knowledge. Regarding attitudes, gender, communication about SRH, and knowledge level were significantly associated with positive attitudes, with students who had adequate knowledge being more likely to exhibit positive attitudes. These findings underscore the importance of strengthening school-based SRH education and counseling for high school students, particularly among groups at risk of inadequate knowledge. Beyond school-based health

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communication, greater involvement of school health staff, primary care providers, obstetricians and gynecologists, and adolescent health counseling services is needed to identify students' support needs early, provide appropriate counseling, and facilitate timely access to specialized reproductive health care when necessary.

### **Conflict of Interest**

The authors declare that they have no conflicts of interest related to the content of this study.

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