

## Awareness regarding Sexually Transmitted Infections among Clinically Suspected Cases Attending Tertiary Care Hospital in India

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### ABSTRACT

**Background:** Sexually transmitted infections (STIs) include a range of clinical syndromes that may be acquired/ transmitted from one individual to another through sexual activity. **Aims/Objectives:** This study aimed to determine the awareness and knowledge of sexually transmitted infections and its associated factors among clinically suspected cases. **Methodology:** A hospital-based cross-sectional study design was used among 194 STIs patients between aged 15 to 60 years from a tertiary care hospital during August 2022 to March 2023. Data were collected through self-administered structured schedule. A multivariate logistic regression analysis was used to identify factors associated with awareness and knowledge of STIs. **Results:** The proportion of respondents with good awareness and knowledge about STIs was 62% and 50% respectively. Respondents with poor awareness and poor knowledge of STIs were found to be more likely to engage in informal treatment care (AOR = 7.39, 95% CI 2.14-25.52 P = 0.002,) and (AOR = 1.21, 95% CI 1.34-4.30, P = 0.021). Place of residence, educational status, occupation, type of treatment care was found to be significantly associated with awareness of STIs and type of treatment care, referral status, delay in seeking treatment were found to be significantly associated with knowledge of STIs. **Conclusions:** The current findings show that the knowledge level on STIs has slightly increased compared to previous studies, but it was still unsatisfactory. The existing education programs in the country should be enhanced, by conveying more information on STIs.

**Keywords:** Awareness, Knowledge, Sexually transmitted infection

### Introduction

Sexually transmitted infections (STIs) are a group of clinical syndromes that can be contracted or passed from one person to another through sexual activity as well as from a mother to her unborn child during pregnancy, childbirth, and nursing<sup>1,2</sup>.

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STIs can raise the risk of HIV and have a direct influence on sexual and reproductive health through stigmatization, infertility, malignancies, and pregnancy complications. According to 2023 report of the World Health Organization, more than 1 million STIs are acquired every day worldwide, the majority of which are asymptomatic in nature and each year it was estimated 374 million new infections with 1 of 4 curable STIs: Chlamydia, Gonorrhoea, Syphilis and Trichomoniasis<sup>3</sup>. STIs are a major health problem that affects mostly young people in developing as well as developed countries<sup>4</sup> due to sexual experimentation occurring at this age<sup>5</sup>. Young adults, due to their insufficient awareness and understanding of STIs, are more susceptible to infection since they participate in risky sexual behaviours with several partners<sup>6-8</sup>. The main obstacle to effectively preventing infection in young adult populations is inadequate awareness and knowledge about STIs<sup>9, 10</sup>. Insufficient awareness about STIs can cause treatment delays, which can exacerbate the infection process<sup>11, 12</sup>. Awareness and knowledge about STIs may have a significant impact on a person's health-seeking behaviour<sup>13</sup>. The factors that influence knowledge of STIs are diverse and include age, sex, residence, marital status, academic year, occupation, stage at time of treatment and delay treatment-seeking behaviour of respondents. This study aimed to assess awareness and knowledge of STIs and its associated factors among clinically suspected cases attending a tertiary care hospital in Eastern Uttar Pradesh

**Objective:** This study aimed to determine the awareness and knowledge of sexually transmitted infections and its associated factors among clinically suspected cases.

### Material and Method

**Study Area:** The present study was conducted in a tertiary care hospital, at STI clinic of the Department of Dermatology & Venereology, Sir Sunderlal Hospital, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh.

**Study Design and Participants:** The present study was a hospital-based cross-sectional study, conducted during August 2022 to March 2023 and aimed to determine the awareness, knowledge of STIs and various associated factors. In this current study interview schedule was used as the main tool of data collection. A systematic sampling method was used to select study participants. The following inclusion criteria were used:

- (i) Written consent for participation in the study
- (ii) Clinically suspected cases of STI in age group of 15-60 years were enrolled.

The questionnaire was divided into the following main sections:

- (i) General demographic characteristics (19 questions);
- (ii) Awareness related to STIs (14 questions);
- (iii) Knowledge related to STIs and effective sources of information (8 questions),
- (iv) Evaluation of sexual behaviour-associated risk as well as their treatment seeking behaviours and barriers to accessing STI services (33 questions).

**Sample Size calculation:** The minimum sample size was determined by using the formula for single proportion:  $N = Z_{(1-\alpha/2)}^2 P(1-P)/\epsilon^2$  based on the estimated awareness level of 14%<sup>14</sup>, 95% confidence level (Z-score value: 1.96) and 5% absolute error, the estimated minimum sample size was approximately 185 (Z= 1.96; P = 0.14; E = 0.05). Adding 5% of the minimum sample size for the expected non-responsive rate, a final sample size of 194 was obtained.

**Study variables:** The dependent variable was knowledge of sexually transmitted infections. The independent variables were age, sex, place of residence, marital status, religion, educational status, caste, socio-economic status, referral status, type of treatment care, and status of delay in seeking treatment.

**Operational definitions:** Good awareness and knowledge was defined as those who scored the median and above value of knowledge-related questions and poor awareness and knowledge was defined as those who scored below the median value of awareness, knowledge-related questions<sup>15, 16</sup>.

**Data Analysis:** Data were entered and analyzed using SPSS software version 28.0 categorical variables were presented as frequencies and percentages.

**Ethical Clearance:** Before the actual data collection, a permission letter was obtained through the proper channel by the Institutional Ethics Committee of the Institute of Medical Sciences, Banaras Hindu University, Varanasi (Letter No.: Dean/2022/ EC/ 3420 dated: 20/08/2022).

**Results:** A total 194 clinically suspected cases of STI were enrolled in this study. Table- 1 summarizes the key socio-demographic characteristics of the study subjects.

Approximately two third of respondents were male (71.6%), majority were Hindus (87.6%) and heterosexual (85.1%). The mean age  $\pm$  standard deviation of study subjects was found  $32.8 \pm 9$  years. Respondents were found higher in proportion (38.7%) in the age group of 25–34 years. More than half (61.3%) of the respondents were from rural area. Most of the respondents (88.1%) were literates, only (11.9%) were illiterates. Three fourth (75.8%) respondents were married, (20%) respondents were migrant laborer, and (9%) were driver (Table -1).

**Table- 1:** Socio-demographic characteristics of the respondents

Variable	Categories	No.	%
Sex	Male	139	71.6
	Female	55	28.4
Age	18-24	37	19.1
	25-34	75	38.7
	35-44	58	29.9
	$\geq 45$	24	12.4
Religion	Hindu	170	87.6
	Muslim	24	12.4
Place of residence	Rural	119	61.3
	Urban	75	38.7
Type of family	Nuclear	94	48.5
	Joint	100	51.5
Qualification	Illiterate	23	11.9
	Primary & Middle	27	13.9
	High School & Intermediate	72	37.1
	Higher Education	72	37.1
Caste	OBC	106	54.6
	General	47	24.2
	SC/ST	41	21.1
Occupation	Students	30	15.5
	House maker	43	22.2
	Gov / Private Services	59	30.4
	Migrant Laborer	40	20.6
	Drivers	18	9.3
	Farmers	8	4.1
Sexual orientation	Heterosexual	165	85.1
	Bisexual	29	14.9
Marital Status	Married	147	75.8
	Unmarried	47	24.2

**Table- 2:** Association of socio-demographic variables with awareness of STIs of respondents

Variables		Awareness status of STIs				$\chi^2$	p-Value
		Good		Poor			
		No.	%	No.	%		
<b>Age Group</b>	15-24	26	70.3	11	29.7	2.542	0.280
	25-44	82	61.7	51	38.3		
	45-60	12	50.0	12	50.0		
<b>Gender</b>	Male	85	63.4	49	36.6	0.457	0.499
	Female	35	58.3	25	41.7		
<b>Current Place of Residence</b>	Rural	61	51.3	58	48.7	14.645	<0.001
	Urban	59	78.7	16	21.3		
<b>Educational Status</b>	Illiterate	3	13.0	20	87.0	70.786	<0.001
	Primary and Middle	7	25.9	20	74.1		
	High School & Intermediate	42	58.3	30	41.7		
	Graduate and above	68	94.4	4	5.6		
<b>Religion</b>	Hindu	105	61.8	65	38.2	0.005	0.945
	Muslim	15	62.5	9	37.5		
<b>Occupation</b>	Students	23	76.7	7	23.3	21.295	0.001
	House maker	23	53.5	20	46.5		
	Government/Private Services	47	79.7	12	20.3		
	Migrant Laborers	15	41.7	21	58.3		
	Drivers	9	50.0	9	50.0		
	Farmer	3	37.5	5	62.5		
<b>Marital Status</b>	Unmarried	35	74.5	12	25.5	4.182	0.041
	Married	85	57.8	62	42.2		
<b>Type of Family</b>	Nuclear	59	62.8	35	37.2	0.064	0.800
	Joint	61	61.0	39	39.0		
<b>Socio-Economic Status</b>	Upper Class	35	89.7	4	10.3	23.667	<0.001
	Upper middle class	22	73.3	8	26.7		
	Middle class	18	62.1	11	37.9		
	Lower middle class	25	47.2	28	52.8		
	Lower class	20	46.5	23	53.5		
<b>Types of Sexual Intercourse</b>	Unprotected	57	55.3	46	44.7	5.118	0.024
	Protected	58	71.6	23	28.4		
<b>Type of Treatment Care</b>	Formal Treatment Care	99	79.2	26	20.8	44.81	<0.001
	Informal Treatment Care	21	30.4	48	69.6		
<b>Stage at time of treatment</b>	Mild Stage	71	79.8	18	20.2	22.771	<0.001
	Moderate Stage	40	48.2	43	51.8		
	Severe Stage	9	40.9	13	59.1		
<b>Referral Status</b>	Direct walk	75	85.2	13	14.8	37.286	<0.001
	Referred	45	42.5	61	57.5		
<b>Delay in treatment -seeking behavior</b>	No Early	71	79.8	18	20.2	22.379	<0.001
	Yes Delayed	49	46.7	56	53.3		

Table -2 shows the percentage distribution of the awareness level of STIs among respondents who experienced STIs according to their background characteristics. Findings of the table show that the respondent’s current place of residence, educational status, occupation, marital status, and socio-economic status, types of sexual intercourse, type of treatment care, stage at the time of treatment, referral status, and delay in treatment-seeking behavior were significantly associated with awareness of STIs (p<0.05). Findings also show that respondents in early age group (15-24) were found higher in proportion with good awareness of STIs. More than two third of the urban respondents were found with good awareness of STIs. Respondents who had higher educational status (graduate and above) were found higher in proportion with good awareness of STIs. More than half of the respondents from lower socio-economic status were found higher in proportion with poor awareness of STIs. Respondents with good awareness of STIs were found higher in proportion who engaged in formal treatment care.

**Table- 3:** Association of socio-demographic variables with knowledge of STIs of respondents

Variables		Knowledge status of STIs				χ <sup>2</sup>	p- Value
		Good		Poor			
		No.	%	No.	%		
<b>Age Group</b>	15-24	23	62.2	14	37.8	3.757	0.153
	25-44	65	48.9	68	51.1		
	45-60	9	37.5	15	62.5		
<b>Gender</b>	Male	71	53.0	63	47.0	1.544	0.214
	Female	26	43.3	34	56.7		
<b>Current Place of Residence</b>	Rural	47	39.5	72	60.5	13.585	<0.001
	Urban	50	66.7	25	33.3		
<b>Educational Status</b>	Illiterate	0	0	23	100.0	118.648	<0.001
	Primary and Middle	2	7.4	25	92.6		
	High School & Intermediate	24	33.3	48	66.7		
	Graduate and above	71	98.6	1	1.4		
<b>Religion</b>	Hindu	88	51.8	82	48.2	1.712	0.191
	Muslim	9	37.5	15	62.5		
<b>Occupation</b>	Students	26	86.7	4	13.3	46.969	<0.001
	House maker	16	37.2	27	62.8		
	Government/Private Services	41	69.5	18	30.5		
	Migrant Laborers	9	25.0	27	75.0		
	Drivers	4	22.2	14	77.8		
	Farmer	1	12.5	7	87.5		
<b>Marital Status</b>	Unmarried	34	72.3	13	27.7	12.383	<0.001
	Married	63	42.9	84	57.1		
<b>Type of Family</b>	Nuclear	44	46.8	50	53.2	0.743	0.389
	Joint	53	53.0	47	47.0		

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<b>Socio-Economic Status</b>	Upper Class	32	82.1	7	17.9	32.654	<0.001
	Upper middle class	21	70.0	9	30.0		
	Middle class	12	41.4	17	58.6		
	Lower middle class	19	35.8	34	64.2		
	Lower class	13	30.2	30	69.8		
<b>Types of Sexual Intercourse</b>	Unprotected	44	42.7	59	57.3	5.731	0.017
	Protected	49	60.5	32	39.5		
<b>Type of Treatment Care</b>	Formal Treatment Care	77	61.6	48	38.4	18.916	<0.001
	Informal Treatment Care	20	29.0	49	71.0		
<b>Stage at time of treatment</b>	Mild Stage	61	68.5	28	31.5	23.996	<0.001
	Moderate Stage	26	31.3	57	68.7		
	Severe Stage	10	45.5	12	54.5		
<b>Referral Status</b>	Direct walk	66	75.0	22	25.0	40.264	<0.001
	Referred	31	29.2	75	70.8		
<b>Delay in treatment - seeking behavior</b>	No Early	61	68.5	28	31.5	22.607	<0.001
	Yes Delayed	36	34.3	28	31.5		

Table - 3 shows the percentage distribution of the knowledge of STIs. Findings of the table show that the respondent's current place of residence, educational status, occupation, marital status, and socio-economic status, sexual intercourse, type of treatment care, stage at time of treatment, referral status, and delay in treatment-seeking behavior were significantly associated with awareness of STIs ( $p < 0.05$ ). More than half of the rural respondents were found with poor knowledge of STIs. Illiterate respondents were found to have poor knowledge of STIs whereas respondents with higher educational status were higher in proportion with good knowledge of STIs. Respondents from upper socio-economic status were higher in proportion with good knowledge of STI. Those who engaged in informal treatment care were higher in proportion who had poor STIs' knowledge (Table-3).

**Table-4:** Logistic regression analysis finding for poor awareness of STIs among respondents

<b>Variables</b>		<b>COR (95%CI)</b>	<b>p value</b>	<b>AOR (95% CI)</b>	<b>p value</b>
<b>Current Place of Residence</b>	Urban	1		1	
	Rural	3.51 (1.81-6.78)	<0.001	3.79 (1.31-11.00)	0.014
<b>Educational Status</b>	Graduate and above	1		1	
	Illiterate	113.33 (23.39-549.01)	<0.001	351.57 (28.69-4306.98)	<0.001
	Primary and Middle	48.57 (12.90-182.88)	<0.001	79.92 (8.52-749.30)	<0.001
	High School & Intermediate	12.14 (3.99-36.92)	<0.001	20.29 (3.19-129.01)	0.001
<b>Occupation</b>	Students	1		1	
	House maker	2.86 (1.01-8.06)	0.047	0.02 (0.01-0.397)	0.010
	Government/Private Services	0.84 (0.29-2.41)	0.745	0.01 (0.01-0.259)	0.004
	Migrant Laborers	4.60 (1.57-13.47)	0.005	0.01 (0.01-0.297)	0.005
	Driver	3.29 (0.94-11.50)	0.063	0.01 (0.00-0.120)	0.001
	Farmer	5.47 (1.03-28.87)	0.045	0.03 (0.00-0.89)	0.043

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<b>Marital Status</b>	Unmarried	1		1	
	Married	2.31 (1.02-4.42)	0.043	7.77 (0.88-68.54)	0.065
<b>Socio-Economic Status</b>	Upper Class	1		1	
	Upper middle class	3.18 (0.85-11.83)	0.084	10.11 (1.26-80.70)	0.029
	Middle class	5.34 (1.49-19.19)	0.01	4.12 (0.61-28.07)	0.148
	Lower middle class	9.80 (3.05-31.46)	<0.001	4.73 (0.75-29.74)	0.098
	Lower class	10.06 (3.04-33.25)	<0.001	1.86 (0.29-11.73)	0.506
<b>Types of Sexual Intercourse</b>	Protected	1		1	
	Unprotected	2.04 (1.09-3.78)	0.025	1.48(0.54-4.02)	0.443
<b>Type of Treatment Care</b>	Formal Treatment Care	1		1	
	Informal Treatment Care	8.70 (4.45-17.01)	<0.001	7.39(2.14-25.52)	0.002
<b>Stage at time of treatment</b>	Severe Stage	1		1	
	Mild Stage	0.17 (0.06-0.47)	0.001	0.17(0.01-2.22)	0.176
	Moderate Stage	0.74 (0.28-1.93)	0.543	0.41(0.08-2.14)	0.288
<b>Referral Status</b>	Direct walk	1		1	
	Referred	7.82 (3.87-15.80)	<0.001	1.85(0.53-6.46)	0.338
<b>Delay in treatment - seeking behavior</b>	No (Early)	1		1	
	Yes (Delayed)	4.50 (2.36-8.58)	<0.001	0.21(0.03-1.37)	0.103

In table 4 Binary logistic regression analysis was applied to identify factors associated with poor awareness of respondents who experienced STIs. In univariate logistic regression table, all independent variables were significantly associated with poor awareness about STIs. Table also shows that rural respondents were 3.5 times more likely to had poor awareness of STIs as compared to their counterparts (OR = 3.51, 95% CI: 1.81-6.78). Respondents in lower socio-economic status were 10 times more likely to had poor awareness of STIs as compared to those who had higher educational status i.e. graduate and above (OR = 10.6, 95% CI: 3.04-33.25). However, after adjusting for other factors, the result of the multivariable logistic regression shows that awareness about STIs was significantly associated with respondent's current place of residence, educational status, occupation, and type of treatment care taken (Table 4).

Table - 5: Logistic regression analysis finding for poor knowledge of STIs among respondents

<b>Variables</b>		<b>COR (95%CI)</b>	<b>p value</b>	<b>AOR (95% CI)</b>	<b>p value</b>
<b>Current Place of Residence</b>	Urban	1		1	
	Rural	3.06 (1.67-5.60)	<0.001	2.17(0.66-7.07)	0.196
<b>Occupation</b>	Students	1		1	
	House maker	10.96 (3.23-37.18)	<0.001	0.54 (0.03-7.49)	0.647
	Government/Private Services	2.85 (0.86-9.37)	0.084	0.74 (0.061-9.19)	0.819
	Migrant Laborers	19.50 (5.34-71.20)	<0.001	0.48 (0.4-6.15)	0.577
	Driver	22.75 (4.92-105.13)	<0.001	0.36 (0.2-7.06)	0.506
	Farmer	45.50 (4.36-474.64)	0.001	1.39 (0.05-39.21)	0.846
<b>Marital Status</b>	Unmarried	1		1	
	Married	3.48 (1.70-7.14)	0.001	1.40 (0.23-8.58)	0.714

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<b>Socio-Economic Status</b>	Upper Class	1		1	
	Upper middle class	1.95 (0.63-6.07)	0.244	2.21(0.29-16.97)	0.445
	Middle class	6.48 (2.12-19.49)	0.001	1.4 (0.21-10.05)	0.701
	Lower middle class	8.18 (3.03-22.06)	<0.001	1.29 (0.21-7.94)	0.788
	Lower class	10.54 (3.71-30.00)	<0.001	1.11 (0.18-6.74)	0.905
<b>Sexual Intercourse</b>	Protected	1		1	
	Unprotected	2.05 (1.14-3.71)	0.017	0.86 (0.28-2.62)	0.799
<b>Type of Treatment Care</b>	Formal Treatment Care	1		1	
	Informal Treatment Care	3.93 (2.08-7.40)	<0.001	1.2 (1.34-4.30)	0.021
<b>Stage at time of treatment</b>	Severe Stage	1		1	
	Mild Stage	0.38 (0.15-0.99)	0.048	2.52 (0.13-48.08)	0.538
	Moderate Stage	1.82 (0.70-4.76)	0.218	1.74 (0.32-9.37)	0.519
<b>Referral Status</b>	Direct walk	1		1	
	Referred	7.26 (3.83-13.74)	<0.001	1.30 (1.28-6.06)	0.031
<b>Delay in treatment-seeking behavior</b>	No (Early)	1		1	
	Yes (Delayed)	4.17 (2.28-7.63)	<0.001	2.61 (0.6-5.57)	0.030

Finding of univariate logistic regression table 5 shows that respondents' current place of residence, occupation, marital status, sexual intercourse, type of treatment care, referral status, and delay in treatment-seeking behavior were significantly associated with knowledge of STIs. Rural respondents were 3 times more likely to had poor knowledge of STIs as compare to urban respondents (OR = 3.06, 95% CI: 1.67-5.60). Respondents who were engaged to unprotected sexual intercourse were 2 times more likely to had with poor knowledge of STIs as compared to their counterparts (OR = 2.05, 95% CI: 1.14-3.71). Respondents who were engaged in informal treatment care were 4 times more likely to had poor knowledge of STIs as compared to those who were practicing formal treatment care (OR = 3.93, 95% CI: 2.08-7.40). After adjusting for other factors, the result of the multivariable logistic regression shows that knowledge about STIs was significantly associated with type of treatment care taken, referral status, and delay in treatment-seeking behavior of respondents (Table 5).

## Discussion

Several studies have revealed that STIs are the cause of the multiplicity of complications and result in poor sexual and reproductive health due to delays in treatment as a result of a lack of awareness and knowledge about STIs <sup>17, 18</sup>. The decision to seek treatment may be heavily influenced by one's awareness and knowledge about STIs <sup>19</sup>.

This cross-sectional study aimed to determine the awareness and knowledge of sexually transmitted infections and its associated factors among clinically suspected cases attending tertiary care hospital.

In this study male was associated with good knowledge about STIs, this finding was supported by a study conducted in Southwest Ethiopia <sup>20</sup>. However, a study conducted in Portugal revealed that women had greater knowledge than men <sup>21</sup>. Another study revealed no variation was found between gender and the level of awareness and knowledge about STIs <sup>22</sup>. The proportion of good awareness (61.9%) and knowledge (50.0%) of STIs among the respondents in this study was found higher than various other studies conducted in India as well as worldwide in general population.



The finding of good knowledge about STIs in this study was higher than 27% in another Indian study conducted in Udipi Taluk, India <sup>23</sup>, greater than 45.4% in Gondar, Ethiopia <sup>24</sup>. While comparing with several other studies across worldwide we also observed that, this finding was lower than 68.3% in the Klang Valley, Malaysia <sup>25</sup>, 70.1% in northern Cape Province, South Africa <sup>26</sup>, 74.7% in urban slums of Jorhat District, India <sup>27</sup>, 79% in Dhaka, Bangladesh <sup>28</sup>, 86.6% in Malaysia <sup>29</sup>. The variation observed compared to other studies could be due to the differences in methodology, sample size, and operational definition used. Besides the socio-cultural, socioeconomic, and behavioral characteristics of the study participants may play a vital role in the variation observed. Respondents with increased academic years were associated with having good awareness and knowledge about STIs. This finding was also supported by a study conducted in Nepal <sup>30, 31</sup>. This could be because of the higher level of education related to more awareness as well as knowledge about STIs. Finding of present study shows that there was no association between gender and the level of awareness & knowledge about STIs, similar finding was observed in a study conducted in Turkey <sup>32</sup>. Those respondents who were practicing unprotected sexual intercourse were significantly associated with poor knowledge about STIs. The odds of poor awareness and knowledge about STI were more likely among respondents who engaged in informal treatment care and seeking delayed treatment compared to their counterparts. This finding was consistent with the studies conducted in Addis Ababa and southwest Ethiopia <sup>33, 34</sup>.

### Limitation of the study

This study includes only those patients who experienced STI symptoms and sought treatment at this health facility. Due to cross-sectional nature of the study, it does not allow inferences to be made from its results. Since all responses were provided by the respondents themselves, there may be recall bias, socially acceptable responses given to prevent embarrassment, and possible inaccuracy of self-report. Due to the increased trend of concurrent relationships, respondents may have multiple sexual partners without disclosing them.

### Conclusion

The current findings show that the awareness and knowledge status of respondents on STIs has slightly increased compared to those in previous local studies, but it was still unsatisfactory. In addition, inculcating the sexual and reproductive health course in the educational curriculum plays a paramount importance factor for determinants of awareness and knowledge about STIs. Existing education programs in the country should be enhanced, by conveying more information on other types of STIs rather than focused solely on HIV. Future research also should focus on studying other factors that can contribute to the low level of awareness and knowledge on STIs.

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