

Knowledge, Attitude and Practice Towards Sexually Transmitted Infections among Health Care Workers and Students at a Tertiary Care Center: A Cross-Sectional Study

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Abstract

Introduction: Sexually transmitted infections (STIs) directly affect sexual and reproductive health through stigmatization, infertility, cancers, and troubles during pregnancy, like perinatal infections. Even though Nepal is regarded as a "low-incidence" country for HIV infection, recent sero-prevalence data indicate that the number of STI/HIV infections has increased significantly. Since health care workers deal with HIV and STIs regularly and are a susceptible group, it is expected that they have good knowledge and practice about the transmission of HIV and STIs.

Materials and Methods: This is a descriptive cross-sectional study conducted at the Department of Dermatology and Venereology of KIST Medical College and Teaching Hospital., Nepal. Any healthcare worker and medical students of the age group 15 to 49 years working and studying respectively in the institute were included in the study. Frequency and percentage of the data were calculated. A chi-square test was applied to determine the association between two categorical variables, and p p-value less than 0.05 was considered significant.

Results: Out of 142 participants, 97.2% recognized HIV and 92.3% recognized syphilis, but only 73.3% identified hepatitis B as an STI, and just 12.7% recognized trichomoniasis. This data shows a gap in knowledge of non-HIV STIs. Except for the practice of using masks and gloves in the workplace, all other variables show statistically significant differences between designations.

Conclusions: The majority of the participants knew HIV, syphilis, and gonorrhea as STIs. But knowledge was not satisfactory with respect to symptoms of STIs/HIV/AIDS and the disease course of STIs/HIV/AIDS.

Keywords: Attitude, Knowledge, Practice, Sexually transmitted infections

Introduction

Sexually transmitted infections (STIs) directly affect sexual and reproductive health through stigmatization, infertility, cancers and troubles during pregnancy like perinatal infections. Every day, about 1 million treatable STIs are acquired by individuals aged 15 to 49 years worldwide. There are about 30 distinct bacteria, viruses, and parasites that can spread through sexual contact, including vaginal, anal, and oral sex. Additionally, certain STIs can be passed from mother to child during pregnancy, childbirth and breastfeeding. STIs are most commonly associated with eight pathogens. Of these, trichomoniasis, chlamydia, gonorrhea, and syphilis are currently curable. Human

immunodeficiency viruses (HIV), human papillomavirus (HPV), herpes simplex virus (HSV), and hepatitis B are the other viral illnesses.¹ Even though Nepal is regarded as a "low-incidence" country for HIV infection, recent sero-prevalence data indicate that the number of HIV/STI infections has increased significantly. This increase can be attributed to a number of factors, including an active sex trade, low condom use, and an increase in HIV among intravenous drug users.²

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Since healthcare workers and medical students frequently deal with HIV and other STIs, they are at greater occupational risk of exposure. Both groups are expected to provide accurate counseling, testing and treatment advice to patients. Knowledge gaps or negative attitudes can lead to wrong advice, stigmatization, and poor patient care. However, previous studies have shown gaps in knowledge and attitudes among health care workers and medical students, highlighting the need for further improvement in education and training. Therefore, this study aims to assess the knowledge, attitudes and practices (KAP) regarding HIV and STIs among healthcare workers and medical students at KIST Medical College and Teaching Hospital., Nepal.

Materials and Methods

This was a descriptive cross-sectional study conducted at Department of Dermatology and Venereology of XXXX Nepal from May 2024 to April 2025. Ethical approval was obtained from the Institutional review committee of the institute. In this study both sexually active and inactive health care workers and medical students aged 15 to 49 years who were working or studying in the institute and only those who provided informed consent to participate were included. Individuals with cognitive impairment and those with incomplete responses were excluded from the study. The sample size was calculated using Cochran's formula:

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

Where:

- $Z = 1.96$ at 95% CI
- p = assumed prevalence of adequate knowledge = 0.5 (since exact prevalence unknown)
- d = margin of error (0.08)

This yielded a minimum required sample of 150. After exclusions, 142 complete responses were analyzed. Convenience sampling was employed, which may include selection bias and limit the generalizability of the findings to the wider population of healthcare workers and medical students. The Probability sampling method was not feasible due to constraints of time, resources, and accessibility of participants within the tertiary care center. Despite this limitation, the finding still provides important insights into KAP on STIs/HIV among the study population.

The study population included different categories of health care workers such as nurses, radiographers, pharmacists, and housekeeping staffs, along with medical students. Participants were approached either in their respective outpatient department (OPD) areas, workplace, or classrooms, depending on feasibility. After providing informed consent, they completed the questionnaire on their own under supervision to clarify any doubts.

A structured self-administered questionnaire was used as the data collection tool. It was developed after reviewing previously published KAP studies on HIV and STIs and adapted to the local context. The questionnaire was first prepared in English, then translated into Nepali, and back-translated to ensure accuracy. Content validity was established through review by a panel of three subject experts in dermatology and venereology. The questionnaire consisted of four sections: (i) Demographic details, (ii) Knowledge about STIs, HIV, and AIDS, (iii) Attitudes towards these infections, and (iv) Practices regarding prevention and patient care. The data were entered in Microsoft Excel and analyzed using SPSS version 22. Frequency and percentage of responses to KAP questionnaire were calculated. A chi-square test was applied to determine the association between two categorical variables like age group and practice, with a p-value <0.05 considered statistically significant. Association between age groups and practice on STIs/HIV/AIDS was evaluated using odds ratios (OR) with 95% confidence intervals (CI).

Results

Among the total 142 participants, 89 (62.7%) fell in 15 to 29 years age group whereas 53 (37.3%) fell in 30 to 49 years age group. There were 57 (40.1%) male and 85 (59.9%) female in this study. Among the total participants, 64 (45.1%) were married and 78 (54.9%) were unmarried. In this study, 13 (9.2%) were nursing staff, 23 (16.2%) were medical students, 64 (45.1%) were intern doctors, and 42 (29.6%) were other healthcare workers like radiographers, pharmacists and house-keeping staffs.

Out of 142 participants, 140 (98.6%) had knowledge about STIs/HIV/AIDS, and 128 (90.1%) knew that sex with any person without using a condom is called unprotected sex. About 3 (2.1%) didn't know the name of STIs, and 138 (97.2%) knew HIV as an STI, 131 (92.3%) knew syphilis as an STI, 105 (73.9%) knew hepatitis B as an STI, and 118 (83.1%) knew gonorrhoea as an STI. About 4 (2.8%) participants didn't know the symptoms of STIs/HIV/AIDS, but 108 (76.1%) agreed that genitourinary symptoms are symptoms of STIs/HIV/AIDS. About 129 (90.8%) and 130 (91.5%) agreed unprotected sex and multiple partners are causes of STIs/HIV/AIDS, respectively. About 121 (85.2%) knew that STIs/HIV/AIDS need treatment; otherwise, it can cause complications. About 133 (93.7%) knew that use of condoms is a method of prevention of STIs/HIV/AIDS. (Table 1)

About 120 (84.5%) participants did not perceive STIs/HIV/AIDS as stigmatizing conditions. About 136 (95.8%) respond yes to a question regarding taking care of sick patients with sexually transmitted infections. About 135 (95.1%) think that STI and HIV AIDS services should be included in every tertiary care centre. About 141 (99.3%) participants think that sexual knowledge should be included in the school curriculum. About

Table 1:- Knowledge regarding STIs/HIV/AIDS

Questions	Yes n (%)	No n (%)
Do you have knowledge regarding STI/HIV/AIDS?	140 (98.6%)	2 (1.4%)
What do you understand by unprotected sex?		
Sexual contact with any person without using condom	128 (90.1)	14 (9.9%)
Multiple sexual partners	93 (65.5%)	49 (34.5)
Sexual contact with sexual workers	84 (59.2%)	58 (40.8%)
Sexual contact with person having infectious disease	73 (51.4%)	69 (48.6%)
Unaware of	5 (3.5%)	137 (96.5%)
Others	4 (2.8%)	138 (97.2%)
What do you understand by STIs/ HIV/AIDS?		
Any symptoms of genital organ	81 (57.0%)	61 (43.0%)
Any disease due to unprotected sexual contact	125 (88.0%)	17 (12%)
Disease transmitted by blood	81 (57%)	61 (43.0%)
Disease transmitted from mothers to baby	71 (50.0%)	71 (50.0%)
Unaware of	7 (4.9%)	135 (95.1%)
Others	3 (2.1%)	139 (97.9%)
Which are STIs?		
HIV/AIDS	138 (97.2%)	4 (2.8%)
Syphilis	131 (92.3%)	11 (7.7%)
Hepatitis B	105 (73.9%)	37 (26.1%)
Gonorrhea	118 (83.1%)	24 (16.9%)
Trichomoniasis	18 (12.7%)	124 (87.3%)
Unaware of	3 (2.1%)	139 (97.9%)
Others	1 (0.7%)	141 (99.3%)
Symptoms of STI/HIV/AIDS?		
Genitourinary symptoms	108 (76.1%)	34 (23.9%)
Weight loss, weakness, loss of appetites	128 (90.1%)	14 (9.9%)
Prolong Diarrhea	81 (57.0%)	61 (43.0%)
Prolonged wound infection	93 (65.5%)	49 (34.5)
Prolonged high-grade fever	72 (50.7%)	70 (49.3%)
Unaware of	4 (2.8%)	138 (97.2%)
Others	4 (2.8%)	138 (97.2%)
Risk factors of STI/HIV/AIDS?		
Unprotected sex	129 (90.8%)	13 (9.2%)
Multiple partners	130 (91.5%)	12 (8.5%)
Recurrent genitourinary problem	58 (40.8%)	84 (59.2%)
Drinking and smoking	13 (9.2%)	129 (90.8%)
Due to sin/ curse/ past life bad work	15 (10.6%)	127 (89.4%)
Infected parents	71 (50.0%)	71 (50.0%)
Blood transfusion, IV drug use, needle prick	97 (68.3%)	45 (31.7%)
Unaware of	5 (3.5%)	137 (96.5%)
Others	3 (2.1%)	139 (97.9%)
How can STI/HIV/AIDS have transmitted to others		
Unprotected sex	130 (91.5%)	12 (8.5%)
Infected syringe, Blood transfusion	134 (94.4%)	8 (5.6%)
Infected Mother to child, Breast feeding	106 (74.6%)	36 (25.4%)
Shaking hands, hugging, kissing, sharing personals	18 (12.7%)	124 (87.3%)
Unaware of	2 (1.4%)	140 (98.6%)
Others	1 (0.7%)	141 (99.3%)
What happens once patient gets STI/HIVAIDS?		
Self-resolution	24 (16.9%)	118 (83.1%)
Needs treatment otherwise it can cause complications	121 (85.2%)	21 (14.8%)
Can't transmit infection or transmission rate decreases if properly treated	72 (50.7%)	70 (49.3%)
Will remain infected and transmit disease lifelong even after treatment	51 (35.9%)	91 (64.1%)
Unaware of	5 (3.5%)	137 (96.5%)
Others	0(0.0%)	142 (100%)
Preventive measures for STI/HIV/AIDS		
Use of condom	133 (93.7%)	9 (6.3%)
Use of Depo, Norplant, OCP, IUCD, permanent methods, withdrawal method	47 (33.1%)	95 (66.9%)
Having single sexual partner	128 (90.1%)	14 (9.9%)
Sex education	110 (77.5%)	32 (22.5%)
Patient treatment and counseling	101 (71.1%)	41 (28.9%)
Contact tracing and treatment	83 (58.5%)	59 (41.5%)
Traditional	6 (4.2%)	136 (95.8%)
Others	9 (6.3%)	133 (93.7%)

Table 2:- Relation between practices on STIs/HIV/AIDS and age group of participants

Question	Age Group (years)	Yes n (%)	No n (%)	P Value	Odds ratio (OR)	95% confidence interval	
						Lower	Upper
Standard precautions methods you use in work place							
Proper uses and dispose of syringe	18-29	83 (64.8%)	6 (42.9%)	P= 0.106	2.46	0.80	7.53
	30 or above	45(35.2%)	8 (57.1%)				
Using mask, gloves while handling	18-29	85 (64.4%)	4 (40%)	P=0.124	2.71	0.73	10.10
	30 or above	47 (35.6%)	6 (60%)				
Wearing gowns and boot	18-29	74 (71.8%)	15 (38.5%)	P=0.001	4.08	1.88	8.86
	30 or above	29 (28.2%)	24 (61.5%)				
Autoclave of instrument	18-29	72 (63.7%)	17 (58.6%)	P=0.613	1.24	0.54	2.85
	30 or above	41 (36.3%)	12 (41.4%)				
Unaware of	18-29	2 (25.0%)	87 (64.9%)	P=0.023	0.18	0.03	0.93
	30 or above	6 (75.0%)	47 (35.1%)				
What advice you give to your friends if you suspect STI/HIV/AIDS							
Go to hospitals and treat	18-29	80 (64.0%)	9 (52.9%)	P=0.376	1.58	0.56	4.44
	30 or above	45 (36.0%)	8 (47.1%)				
Go for blood test	18-29	74 (62.7%)	15 (62.5%)	P=0.984	1.01	0.41	2.50
	30 or above	44 (37.3%)	9 (37.5%)				
Don't donate blood	18-29	70 (68.0%)	19 (48.7%)	P=0.034	2.23	1.04	4.76
	30 or above	33 (32.0%)	20 (51.3%)				
Unaware of	18-29	7 (63.6%)	82 (62.6%)	P=0.945	1.04	0.29	3.65
	30 or above	4 (36.4%)	49 (37.4%)				
Others (Condoms are not necessary after treatment, you should stop treatment once symptoms disappear)	18-29	4 (50.0%)	85 (63.4%)	P=0.445	0.58	0.14	2.36
	30 or above	4 (50.0%)	49 (36.6%)				
Do you buy/ share food, personals with person with STI/HIV/AIDS?	18-29	43 (65.2%)	46 (60.5%)	P=0.570	1.22	0.59	2.52
	30 or above	23 (34.8%)	30 (39.5%)				
Will you be in relationship or marry a person with STI/HIV/AIDS?	18-29	12 (80.0%)	77 (60.6%)	P=0.142	2.60	0.67	9.99
	30 or above	3 (20.0%)	50 (39.4%)				

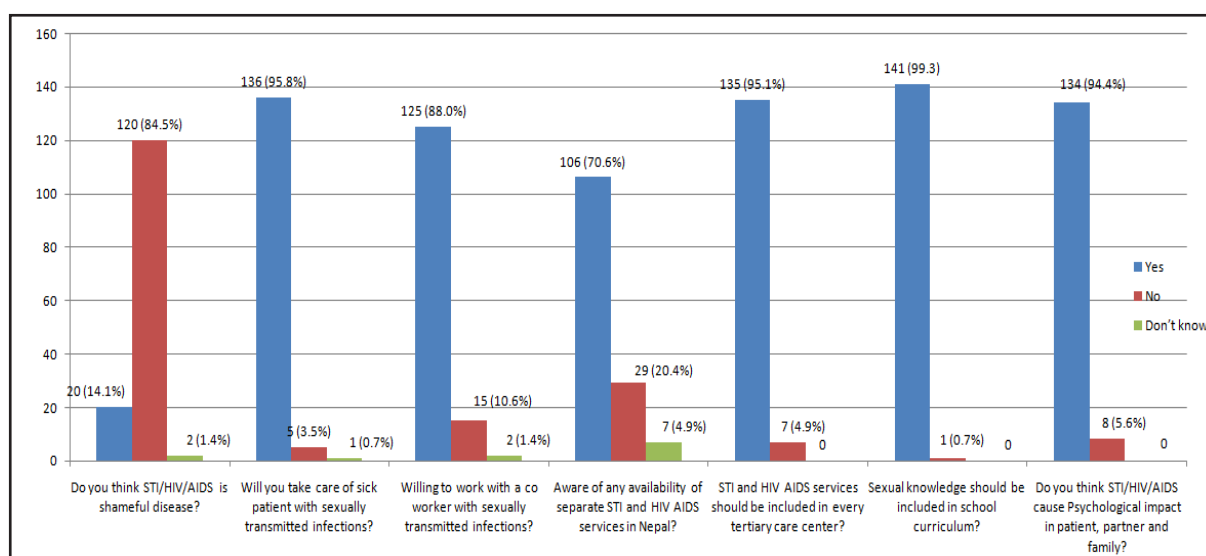


Figure 1: Bar graph showing attitude regarding STIs/HIV/AIDS

Table 3:- Relation between practices on STIs/HIV/AIDS and designation of participants

Questions	Designation	Yes n (%)	No n (%)	P value
Standard precautions methods you use in work place				
Proper uses and dispose of syringe	Nurse	13 (100%)	0 (0.0%)	P=0.0021
	Medical students	22 (95.65%)	1 (4.35%)	
	Intern Doctors	60 (93.75%)	4 (6.25%)	
	Other Staff	33 (78.57%)	9 (21.43%)	
Using mask, gloves while handling	Nurse	12 (92.31%)	1 (7.69%)	P=0.0681
	Medical students	23 (100%)	0 (0.0%)	
	Intern Doctors	60 (93.75%)	4 (6.25%)	
	Other Staff	37(88.10%)	5 (11.90%)	
Wearing gowns and boot	Nurse	11 (84.62%)	2 (15.38%)	P=0.0028
	Medical students	12 (52.17 %)	11 (47.83 %)	
	Intern Doctors	52 (81.25%)	12 (18.74%)	
	Other Staff	28 (27.2%)	14 (35.9%)	
Autoclave of instrument	Nurse	9 (66.67%)	4 (33.33%)	P=0.0136
	Medical students	20 (86.96%)	3 (13.04%)	
	Intern Doctors	55 (85.94%)	9 (14.06%)	
	Other Staff	29 (69.05%)	13 (30.95%)	
Unaware of	Nurse	1 (7.69%)	12 (92.31%)	P=0.001
	Medical students	5 (21.74%)	18 (78.26%)	
	Intern Doctors	0 (0.0%)	64 (100%)	
	Other Staff	2 (4.76%)	40 (95.24%)	
What do you advise to your friends if you suspect STI/HIV/AIDS				
Go to hospitals and treat	Nurse	9 (69.23%)	4 (30.77%)	P=0.0082
	Medical students	19 (82.61%)	4 (17.39%)	
	Intern Doctors	60 (93.75%)	4 (6.25%)	
	Other Staff	37 (88.10%)	5 (11.90%)	
Go for blood test	Nurse	12 (92.31%)	1 (7.69%)	P=0.0314
	Medical students	22 (95.65%)	1 (4.35%)	
	Intern Doctors	50 (78.13%)	14 (21.88%)	
	Other Staff	34 (80.95%)	8 (19.05%)	
Don't donate blood	Nurse	11 (84.62%)	2 (15.38%)	P=0.0261
	Medical students	20 (86.96%)	3 (13.04%)	
	Intern Doctors	45 (70.31%)	19 (29.69%)	
	Other Staff	27 (64.29%)	15 (35.71%)	
Unaware of	Nurse	4 (30.77%)	9 (69.23%)	P=0.001
	Medical students	4 (17.39%)	19 (82.61%)	
	Intern Doctors	1 (1.56%)	63 (98.44%)	
	Other Staff	2 (4.76%)	40 (95.24%)	
Others (Condoms are not necessary after treatment, you should stop treatment once symptoms disappear)	Nurse	0 (0.0%)	13 (100%)	P=0.001
	Medical students	5 (21.74%)	18 (78.26%)	
	Intern Doctors	0 (0.0%)	64 (100%)	
	Other Staff	3 (7.14%)	39 (92.86%)	
Do you buy/ share food, personals with person with STI/HIV/AIDS?	Nurse	3 (23.08%)	10 (76.92%)	P=0.001
	Medical students	1 (4.17%)	22 (95.83%)	
	Intern Doctors	39 (60.94%)	25 (39.06%)	
	Other Staff	23 (54.76%)	19 (45.24%)	
Will you be in relationship or marry a person with STI/HIV/AIDS?	Nurse	4 (30.77%)	9 (69.23%)	P=0.0096
	Medical students	1 (4.35%)	22 (95.65%)	
	Intern Doctors	6 (9.38%)	58 (90.63%)	
	Other Staff	4 (9.52%)	38 (90.48%)	

134 (94.4%) participants think that STI/HIV/AIDS causes psychological impact in patients, partners, and families. (Figure 1)

There was significant difference (odds ratio=4.08, 95% CI 1.18-8.86, $P=0.001$) between the practice of wearing gowns and boot in the workplace according to the age group of the participant. (Table 2) Except practice of using mask and gloves in the workplace all other variables show statistically significant difference between designations. (Table 3)

Discussion

Assessing healthcare workers and medical student's knowledge, attitude, and practice (KAP) regarding STIs was the main objective of our study. In our study, out of 142 participants, 140 (98.6%) knew about STI/HIV/AIDS, and 128 (90.1%) knew that sexual contact with any person without using a condom is called unprotected sex. These findings may not be fully applied to all healthcare workers and medical students, as some groups may be over or under pictured. And also, individuals with greater awareness in STI/HIV may have been more likely to take part, potentially assessing high knowledge and positive attitudes. In our study 3 (2.1%) participant didn't know the name of STIs, and 138 (97.2%) knew HIV as an STI, 131 (92.3%) knew syphilis as an STI, 105 (73.9%) knew hepatitis B as an STI, and 118 (83.1%) knew gonorrhea as an STI. Likewise, a study done by Poudel M. et al.³ revealed that over 86% of the participants knew about STDs, HIV, and AIDS. Another study done by Hussain MF et al.⁴ showed that 94.2% knew about *Neisseria gonorrhoeae*, while only 38.8% knew about syphilis. A related study conducted on paramedical students by Misra SK et al.⁵ revealed that, in terms of STI knowledge, 59.9% and 40.9% of the students were aware of HIV and syphilis as STI types, while 23.8%, 20% and 12.7% of students were aware of gonorrhea, hepatitis B and C and Trichomoniasis as STI types respectively. In this study, only 73.3% of healthcare workers and medical students recognized hepatitis B as STI. This showed that they were unaware of its sexual mode of transmission; Such knowledge gaps are concerning, as they may lead to miscalculation of transmission risk and inadequate patient education about safe sexual practices

In our study, about 129 (90.8%), 130 (91.5%), and 97 (68.3%) agreed that unprotected sex, multiple partners, and needle prick injury are risk factors of STIs/HIV/AIDS, respectively. Some participants still considered casual contact, such as sharing food or personal items, as a possible mode of transmission, which reflects inadequate understanding of established risk factors. These findings are consistent with earlier studies done by Mahboob N et al.⁶ in medical students, where more than 90% mentioned multiple partners, and 84.78% mentioned sharing needles as a mode of transmission. Also, misconceptions about the mode of transmission of STIs were also prevailing among these students.

In our study, about 133 (93.7%) knew that the use of condoms is a method of prevention of STIs/HIV/AIDS. Another study done by Gupta M et al.⁷ on the use of condoms to prevent STIs revealed that 34.4% of patients had knowledge, attitude, and practice related to condom use. 31.6% of patients with knowledge and attitude had inadequate practice. Despite having the right attitude and knowledge, 19.6% lacked practice. The remaining 14.4% lacked knowledge as well. In this study 125 (88.0%) participant agreed that they were willing to work with patient with STIs/HIV/AIDS, which shows encouraging professional commitment and reduced stigma. Our findings are similar to a study done by Hamunyela LU et al.⁸ in which 86.3% of nursing students disagree with keeping distance during care of STI/HIV patients.

In our study, about 141 (99.3%) participants think that sexual knowledge should be included in the school curriculum. Another study done by Skaletz-Rorowski A et al.⁹ showed that most of the young individuals had heard about STIs, but primarily HIV/AIDS rather than other types of STIs, so it is important that non-HIV STIs and STI prevention are explicitly included in the school curriculum. In our study, attitudinal differences were evident in responses related to sharing food and personal items with individuals living with STI/HIV. About 76.92% of nurses and 95.83% of medical students reported unwillingness to share food, indicating persistent stigma despite medical training. A different study done by Lui PSC et al.¹⁰ found that more nursing students (83.3%) than medical students (73.1%) would share eating utensils with a relative who has HIV ($P = 0.005$).

It is important to take into account some limitations when interpreting the study's findings. The cross-sectional design restricts the ability to determine causal associations between knowledge, attitudes, and practices towards STIs/HIV/AIDS. Furthermore, the use of convenience sampling may have introduced selection bias, as the participants included may not fully represent all healthcare workers and medical students of Nepal. As data were self-reported, there is a chance of self-reporting bias, which may have led individuals to overstate correct practices or underreport negative attitudes.

Conclusion

In this study, most participants were aware of HIV, syphilis, and gonorrhea as STIs, and many recognized unprotected sex and multiple sexual partners to be the cause of STIs/HIV/AIDS. However, knowledge about the symptoms of STIs/HIV/AIDS was found to be inadequate. Except for the practice of using masks and gloves in the workplace, all other variables show statistically significant differences between designations. While the overall attitude of participants was positive, certain negative perceptions remained, particularly reluctance to work with colleagues and marrying one living with

sexually transmitted infections. This highlights the need for at least annual refresher training on infection prevention, safe practices, and regarding risk factors of STIs/HIV/AIDS for healthcare workers and medical students.

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