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### RESEARCH PAPER

# Epidemiological study of sexually transmitted infections in patients attending sexually transmitted infection clinics of a tertiary care hospital

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**Background and aims:** Sexually Transmitted Infection (STI) is a significant public health problem worldwide, especially in developing countries. The study's objectives were to study the pattern of STI and Reproductive Tract Infections (RTI) cases attending the STI clinic of a Tertiary Care Hospital and to study the epidemiologic correlates of these cases. **Materials and methods:** This cross-sectional descriptive study was conducted among patients attending the STI clinic of a tertiary care hospital in Assam for six months. A structured pretested questionnaire was designed to collect the background information; knowledge, opinion, and attitude on STI/RTI; condom usage, sexual behaviour, and utilization of health services. Informed written consent was taken from the study subjects. **Results:** Almost 47% of the study subjects were 26-35 years old, and 51.3% were males. Genital ulcer/sore (40.3%) among the males and genital/anal discharge (76.7%) in females were the commonest. Among those having past episodes of STI/RTI, 87.2% got counselling on STI and the use of a condom, and 51.3% counselling and treatment of their sex partners. The most frequent high-risk sexual activity was multiple sex partners. 75% of the respondents did not use a condom during their first sexual activity. Television (80.7%) and radio (80%) were critical education sources. **Conclusion:** Early sexual activity initiation was not noted in the study. Despite counselling services being used, condom use behaviour was poor. Multiple sex partners were the high-risk activity that was seen most frequently. The study subjects were not well-informed about the link between STIs and HIV/AIDS.

**Keywords:** Reproductive tract infections; multiple sex partners; genital/anal discharge.

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## INTRODUCTION

The term sexually transmitted infections (STIs) refers to a class of infectious diseases that are spread primarily through sexual contact and are brought on by various pathogens. STIs have generally replaced sexually Transmitted Diseases (STDs) since 1999 as it more aptly reflects

asymptomatic infections.<sup>1</sup> More than 340 million people worldwide are afflicted by STIs each year, of whom 30 million live in India.<sup>2</sup>

The consequences of STIs include acute symptoms, chronic infection, adverse pregnancy outcomes, congenital infections, and delayed severe consequences such as infertility,

ectopic pregnancy, cervical cancer, and untimely deaths. Individuals with another STI are at increased risk of acquiring or transmitting HIV.<sup>3,4</sup>

People affected by STIs and HIV often bear a burden of stigma and discrimination. Discrimination restricts a person's access to employment and education.<sup>5</sup> 57 million disability-adjusted life are lost due to STIs globally.<sup>6</sup>

The worldwide incidence of major bacterial and viral STDs is estimated at over 125 million cases yearly.<sup>7</sup> Each year, more than 340 million new curable cases of STIs occur in the reproductive age group of both men and women.<sup>8</sup> About 33 million new cases of HIV and 100 million plus infections caused by other viral STIs occur every year, with the most significant proportion in the region of south and Southeast Asia, followed by Sub-Saharan Africa, Latin America and the Caribbean.<sup>9</sup> As diagnosis and treatment of STIs are often delayed or inadequate in developing countries, complications can also be high.<sup>10</sup>

The Northeastern states of India share the country's most significant number of AIDS cases.<sup>11</sup> Among the states, Manipur has shown the highest estimated adult HIV prevalence (1.40%).<sup>12</sup> Assam serves as a gateway for the other Northeastern states. With its proximity to other HIV-affected states, Guwahati poses a severe threat to the spread of HIV infection. Because of these critical geographical and strategic locations and the diverse population pattern, an epidemiological study of STIs in this area is worth while.

The present study was conducted among patients attending the STI clinic of a tertiary care hospital in Assam to study the pattern of STI and RTI cases attending the clinic and to study the epidemiologic correlates of these cases.

## MATERIALS AND METHODS

The present study was a cross-sectional descriptive study conducted among patients attending the STI clinic of a tertiary care hospital in Assam for six months. A structured pretested questionnaire was designed to collect the information. The questionnaire included questions on background, knowledge, opinion, and attitude on STI/RTI, awareness of condom usage, sexual behaviour of the participants, and utilization of health services. Informed written consent was taken from the study subjects after explaining the purpose of the study. To ensure strict confidentiality, information revealing the participant's identity, like names, addresses, and OPD numbers of the prescription papers, was not collected. Ethical clearance was obtained from the institutional ethical committee.

**Inclusion and exclusion criteria:** All STI/RTI cases of both sexes of age more than 18 years that attended the STI clinic of the study hospital during the study period were included. Diagnosing various STIs was based on clinical/laboratory diagnosis at the STI clinic.

Patients below 18 years of age, those not giving consent for the study, or those severely ill were excluded. Also, patients who attended the STI clinic for the second time during the study were omitted.

**Sample size:** The number of STI/RTI patients who attended the STI clinic was usually 10 per day. Out of which 2 were new patients. Assuming to enrol both of these patients, an average of 10 per week were eligible for enrollment. Therefore, in the available four months, 160 patients were expected to be eligible for the proposed study. Assuming a 10% non-participation, a sample of 144 patients was proposed for the current study.

**Statistical analysis:** Data analysis was performed using statistical software Epi-info and Statistical Package for the Social Sciences (SPSS) version 21. Microsoft Excel was utilized for preparing graphs and tables. The data were represented as frequencies and percentages.

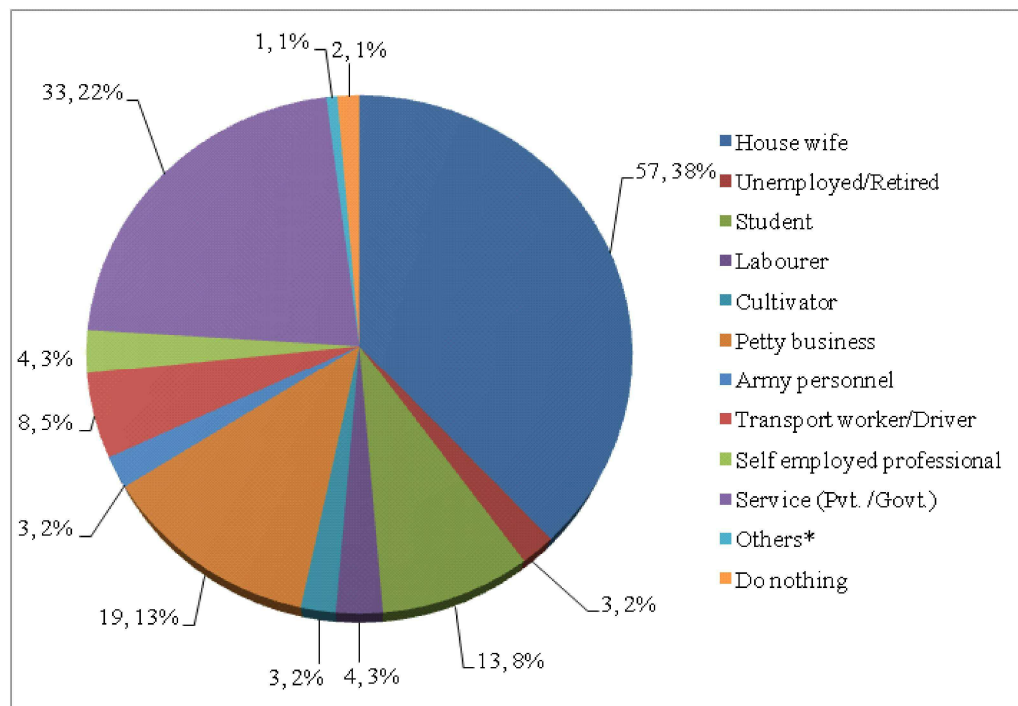
## RESULTS

Most of the study subjects were from the age group of 26-35 years (46.7%). Out of the 150 study participants, 51.3% were males. Almost one-third of the study subjects were married (72.0%). A higher percentage of study subjects (58.0%) were from rural areas (**Table 1**).

**Table 1** Socio-demographic characteristics (N=150)

Characteristics		Number	%
Age	18-25	50	33.3
	26-35	70	46.7
	36-45	23	15.3
	46-55	5	3.3
	>55	2	1.3
Sex	Male	77	51.3
	Female	73	48.7
Maritalstatus	Married	108	72.0
	Unmarried	40	26.7
	Separated	2	1.3
Residence	Urban	63	42.0
	Rural	87	58.0

Among the study subjects, 38.0% were homemakers, followed by 22.0% employed in some service. Almost 13% of the participants were involved in petty businesses, while 8% were students (**Figure 1**).



\*Female sex worker(n=1)

**Figure 1** Occupational status of the study subjects. (N=150)

As seen from **Table 2**, genital ulcer/sore (40.3%) followed by genital itching or reddening (24.7%) were the most typical presenting complaint among the male study subjects. While the most common presenting complaint among the female study subjects was genital/anal discharge (76.7%). There was a statistically significant association between the gender of the patient and the associated types of STI/ RTI (p-value<0.001).

**Table 2** Patterns of presenting complaints among study subjects

Types of STI/RTI (Syndromic diagnosis)	Male (n <sub>1</sub> =77)		Female (n <sub>2</sub> =73)		p-value for Chi-square
	No.	%	No.	%	
Genital / Anal discharge (n=56)	13	16.9	56	76.7	<0.001
Genital itching/reddening (n=24)	19	24.7	5	6.8	
Genital ulcer/sore (n=37)	31	40.3	6	8.2	
Skin rashes (n=8)	8	10.4	0	0	
Pain in the lower abdomen (n=2)	0	0	2	2.7	
Irregular menstrual cycles (n=1)	0	0	1	1.4	
Genital Warts (n=9)	6	7.8	3	4.1	

Past episodes of STI/RTI were reported in 39 patients. Among the study subjects who had a past episode of STI/RTI, a significant association (p-value<0.05) was observed between the types of STI/RTI and the gender of the participants. Genital ulcer/sore (44%) was most frequent in males, and genital/anal discharge (57.1%) was most widespread in females. (**Table 3**).

**Table 3** Patterns of past episodes of STI/RTI among the study subjects. (n=39)

Types of STI/RTI (Syndromic diagnosis)	Male (n <sub>1</sub> =25)		Female (n <sub>2</sub> =14)		p-value for Chi-square
	No.	%	No.	%	
Genital / Anal discharge	3	12	8	57.1	0.01
Genital itching/reddening	9	36	3	21.4	
Genital ulcer/sore	11	44	2	14.3	
Skin rashes	2	8	0	0	
Irregular menstrual cycles	0	0	1	7.1	

Most of the study subjects who had past episodes of STI/RTI went to Government Hospital (64.1%) for treatment during the last episode of STI/RTI. Also, 87.2% got counselling on STIs and the use of condoms, whereas 51.3% got counselling and treatment for their sex partners (**Table 4**).

**Table 4** Patterns of health care services and counselling services utilized by the study subjects during the last episode of STI/RTI (n=39)

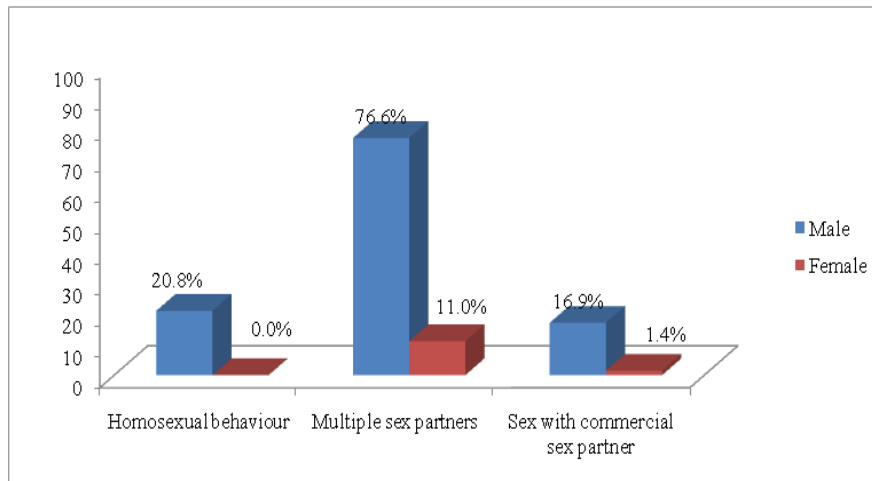
Health care and counselling services utilized during the last STI/RTI episode		No.	%
Health care services	Took home-based preparation	1	2.6
	Went to a private clinic/hospital	9	23.0
	Went to govt. clinic/hospital	25	64.1
Counselling services	Purchased medicine from a medical store	4	10.3
	Counselling on STIs and usages of condoms	34	87.2
	Counselling and treatment received by the sex partner	20	51.3

The most common age of first sexual activity was 21-25 years (39.3%), whereas 0.7% had first sexual activity below 15. The majority, 75% of the respondents, did not use a condom during their first sexual activity (Table 5).

**Table 5** Patterns of first sexual activity of the study participants. (N=150)

Age groups (years)	Total	
	No.	%
<15	1	0.7
15-20	56	37.3
21-25	59	39.3
26-30	27	18.0
>30	7	4.7
Used condoms during first sexual activity		
Yes	37	25%
No	113	75%

High-risk sexual behaviour was less prevalent among females than males. Among the male study subjects, 20.8% indulged in homosexual activity, and 76.6% had multiple sex partners. Compared to 16.9% of male participants, only 1.4% of female participants reported having sex with commercial sex workers (**Figure 2**).



\*Multiple responses

**Figure 2** Patterns of high-risk sexual behaviour among the study subjects

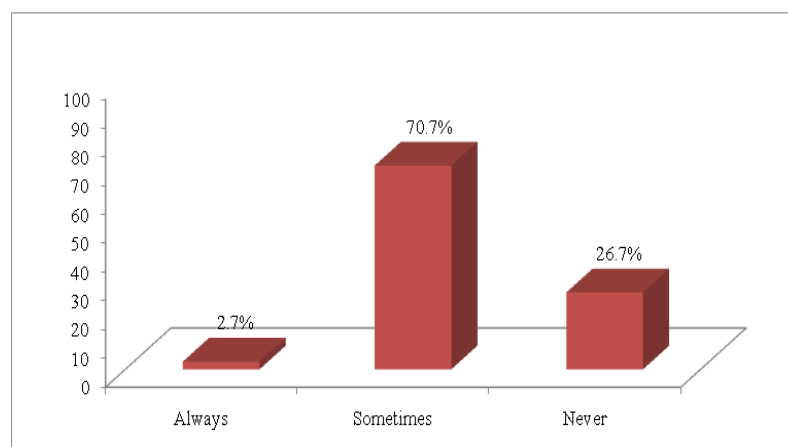
As seen from Table 6, among the married study subjects, 63.0% reported that their sex partners had no STI/RTI, whereas 21.3% were unaware of their partners' STI/RTI status. Among the unmarried study subjects, 67.5% were unaware of their sex partner's STI/RTI status, whereas

32.5% reported that their sex partners had no STI/RTI. The chi-square test revealed a significant association between the marital status of the study participants and their awareness of the STI/RTI status of their partner (p-value <0.0001)

**Table 6** Marital status of the study subjects and awareness about STI/RTI status of their partner(s)

Marital status of the study subjects	Awareness of STI/RTI status of their partner(s)						p-value for Chi-square
	STI/RTI Present		STI/RTI Absent		Do not know		
	No.	%	No.	%	No.	%	
Married (n=108)	17	15.7	68	63.0	23	21.3	<0.0001
Unmarried (n=40)	0	0	13	32.5	27	67.5	
Separated/Deserted (n=2)	1	50	0	0	1	50	

Most of the study subjects (70.7%) sometimes used condoms, and only 2.7% always used a condom during their sexual activity (**Figure 3**).



**Figure 3** Frequency of condom usage among the study subjects. (N=150)

Most study subjects (95.3%) knew about using condoms to avoid pregnancy/family planning methods, 80.7% knew about condoms to protect from HIV/AIDS, and 37.3% knew that condoms could prevent STIs during sexual activity. Only 4.7% of participants did not know the usage of a condom. Of the study's 150 participants, 37.3% knew about STIs, and 18.7% knew that STI patient has a high chance of HIV/AIDS exposure.

Also, 81% of the participants received education from any source about using a condom to prevent STI/HIV/AIDS during sexual activity. Television (80.7%) and radio (80%) were critical education sources. In comparison, other sources like cinema halls (77.3%), newspapers/magazines (72%), and hoarding/placards/posters/billboards/wall writing/metal tablets (71.3%) also played a significant role in educating about the usages of the condom to prevent STI/HIV/AIDS among the study subjects (**Table 7**).

**Table 7** Sources of education received by the study subjects about the use of a condom to prevent STI/HIV/AIDS (N=150)

Sources of education	Total	
	No.	%
Government doctor	39	26
Private doctor	11	7.3
Village health worker/nurse from govt. hospital/clinic	27	18
Doctor/nurse in a mobile clinic	1	0.7
Visiting health workers from NGOs	10	6.7
Anganwadi workers	12	8
Friends/peers/spouse/other family members	73	48.7
Radio	120	80
TV	121	80.7
Cinema hall	116	77.3
Newspaper/magazine	108	72
Hoarding/placard/poster/billboards/wall writing/metal tablets	107	71.3
Electronic board	0	0
Handbills/pamphlets/booklets	0	0
Public announcements	33	22
Drama/skits/street play/puppet show	26	17.3
Campaign/meeting	21	14.0
Others**	9	6.0

\*Multiple responses, \*\*Other sources=Teacher (no. =5), books (no. =3), internet (no. =1)

## DISCUSSION

The present descriptive study was conducted among patients attending the STI clinic of a tertiary care hospital in Assam for six months to assess the pattern of STI and RTI cases attending the STI clinic and to study the epidemiologic correlates of these cases.

In the present study, out of 150 subjects, males comprised 51.3% and females 48.7% of the cases. A study from Manipur also reported a higher percentage of males (46.1%) than females (45.1%) among STI cases.<sup>13</sup>

Among the female subjects, the most common presenting complaint was genital/anal discharge (76.7%), followed by genital ulcer (8.2%). While among the male

subjects most common presenting complaint was genital ulcer/sores (40.3%). Similar to our finding, Sarkar et al., reported vaginal discharge (29.9%) as the most common complaint among female patients, followed by genital ulcer (8.4%).<sup>14</sup> The same study also stated genital ulcer (51.9%) as the most common complaint among males, followed by urethral discharge (13.8%) agrees with our findings.

The majority of the study subjects were married (72.0%), belonging to the age groups of 26-35 years (46.7%), which is similar to the study reported by Jindal et al.<sup>15</sup> At this age, a person is at the height of their reproductive potential and is sexually very active, which increases the risk of infection.

Most of the study subjects with STI were reported from a rural background (58.0%). In contrast to our findings, a study from Gwalior reported that most of the study subjects were from urban areas.<sup>16</sup> Ignorance and non-availability of healthcare facilities may be the reason for the increased prevalence of STIs among the rural population. Among the study subjects, the majority (38.0%) of the cases were homemakers. Similar findings were observed in various other studies.<sup>17,18</sup>

In our study, 26% of the subjects had a history of STI/RTI. The common interval period from the last episode of STI/RTI was one year or more. Most received treatment from a government clinic/hospital (64.1%) during the last episode. About 87.2% received counselling on STIs and usage of a condom, while 51.3% received partner treatment. The most common age of first sexual activity was 21-25 years (39.3%). About 0.7% had their first sexual activity below 15 years. Most of the study subjects did not use a condom during their first sexual activity.

In our study, 97(64%) cases had high-risk sexual behaviour, with 76.6% of males having multiple sex partners and 20.8% indulging in homosexual activity. Whereas in females, 11.0% had multiple sex partners. Partner support may be crucial in reducing high-risk sexual behaviour.<sup>19</sup>

Regarding condom usage, about 2.7% of subjects always used, and 26.7% never used a condom during their sexual activity. A majority knew about condom usage, whereas few did not know at all.

Regarding awareness of the STI/RTI status of the partners, 21.3% of the married and 67.5% of the unmarried subjects were unaware of their status. Only 18% of the subjects used a condom during their last sexual activity. Prateek N et al.,<sup>20</sup> reported similar observations. In our study, 37.3% knew about STIs, and 18.7% knew that STIs have a high chance of HIV/AIDS exposure. About 81% of subjects received education about the usage of condoms from TV (80.7%) and radio (80%).

STI s are a significant public health problem worldwide, especially in developing countries. RTI affects women's health and social well-being, particularly in the reproductive and economically most productive age groups

and their offspring.<sup>21</sup> In developing countries, high STIs and related complications result from inadequate health service provision and delays in seeking healthcare.<sup>22</sup> Levels of awareness about STIs are generally low because of the stigma and the asymptomatic nature of many STIs. Despite the counselling services being used by a large number of study subjects, safe sex practices are not followed; therefore, there is a need to strengthen the counselling and education services.

**Limitation:** The short study period and small size is the study's major limitation. Also, in-depth interviews regarding the high-risk behaviour of the study subjects could not be conducted.

## CONCLUSION

The proportion of male and female patients attending the clinic was almost alike. A wide variety of STI/RTI cases were reported among the participants. The most common syndromic diagnosis observed during the study was genital/anal discharge, and the most common complaint was genital ulcer/sore in males and genital/anal discharge in females. The types of STI/RTI were significantly associated with the gender of the participant.

Early initiation of sexual activity was not observed in the present study. Condom use at first sexual activity and consistent use of condoms during their sexual activity was low despite counselling services available and being utilized by the study subjects. The most common high-risk behaviour observed was multiple sex partners. There was low awareness among the study subjects regarding the relationship between STIs and HIV/AIDS.

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**Contribution of Authors:** We declare that this work was done by the authors named in this article, and the authors will bear all liabilities about claims relating to the content of this article.

## REFERENCE

1. Holmes KK. Sexually transmitted diseases; overview and clinical approach. In: Harrison's principles of internal medicine. 15<sup>th</sup> Ed. New York: McGraw-Hill, 2001; 839-848.
2. National AIDS Control Organization (NACO). National guidelines on prevention, management and control of reproductive tract infections, including sexually transmitted infections. 2006 Nov.
3. Rathod SP, Padhiar B, Shah B. Sexually transmitted infections and human immuno-deficiency virus coinfection: Scenario in Western India. *Indian J Sex Transm Dis AIDS* 2020 Jul-Dec;41(2):162-168. doi: 10.4103/ijstd.IJSTD\_87\_18.
4. World Health Organization. Global prevalence and incidence of curable STIs. Geneva, 2001(WHO/CDS/CDR/EDC/2001.10).
5. King K Holmes, P. Frederick Sparling et al. Sexually transmitted diseases. 4<sup>th</sup> edition 2008, p. 14.
6. Murray CJ, Acharya AK. Understanding DALYs (disability-adjusted life years). *J Health Econ* 1997 Dec;16(6):703-30. doi: 10.1016/s0167-6296(97)00004-0.
7. De Schryver A, Meheus A. Epidemiology of sexually transmitted diseases: the global picture. *Bulletin of the World Health Organization* 1990; 68 (5): 639 - 654. Available from: <https://apps.who.int/iris/handle/10665/261388>
8. World Health Organization. Global prevention and incidence of selected curable Sexually Transmitted Infections: Overview and estimates. Geneva 2001.
9. Moges B, Yismaw G, Kassu A, Megabiaw B, Alemu S, Amare B, Muluye D. Sexually transmitted infections based on the syndromic approach in Gondar town, northwest Ethiopia: a retrospective study. *BMC Public Health* 2013 Feb 16;13:143. Doi: 10.1186/1471-2458-13-143.
10. World Health Organization. Global strategy for the prevention and control of sexually transmitted infections: 2006-2015. Geneva 2007.
11. Mayaud P, Mabey D. Approaches to the control of sexually transmitted infections in developing countries: old problems and modern challenges. *Sex Transm Infect* 2004 Jun;80(3):174-82. doi: 10.1136/sti.2002.004101.
12. Provisional report of Census of India 2011. National AIDS Control Organisation (NACO), Ministry of Health and Family Welfare, Government of India. Annual Report 2011-12. Available from: [www.nacoonline.org](http://www.nacoonline.org)
13. Zamzachin G, Singh NB, Devi TB. STD trends in regional institute of medical sciences, Manipur. *Indian J Dermatol Venereol Leprol* 2003 Mar-Apr;69(2):151-3.
14. Sarkar S, Shrimal A, Das J, Choudhury S. Pattern of sexually transmitted infections: a profile from a sexually transmitted infections clinic of a tertiary care hospital of eastern India. *Ann Med Health Sci Res* 2013 Apr;3(2):206-9. doi: 10.4103/2141-9248.113663.
15. Jindal N, Aggarwal A, Gill P, Sabharwal B, Sheevani BB. Community-based study of reproductive tract infections, including sexually transmitted infections, among the rural population of Punjab, India. *Indian J Community Med* 2009 Oct;34(4):359-61. doi: 10.4103/0970-0218.58401.
16. Mishra A, Verma P, Marathe N, Srivastava D. Study of the profile of patients with STDs attending a STD clinic in JAH, Gwalior. *Indian J Community Med* 2008 Oct;33(4):263-4. doi: 10.4103/0970-0218.43235.



17. Shethwala N, Mulla S. Study on reproductive tract infection among the female patients attending the Gynecology OPD in one of the teaching Hospitals of Gujrat-India. *Int J Med Sci Public Health* 2014 Feb 1;3(1):123-5.
18. Hegde SK, Agrawal T, Ramesh N, Sugara M, Joseph PM, Singh S, Thimmaiah S. Reproductive tract infections among women in a peri-urban underprivileged area in Bangalore, India: Knowledge, prevalence, and treatment seeking behavior. *Annals of Tropical Medicine and Public Health* 2013 Mar 1;6(2).
19. Mhalu A, Leyna GH, Mmbaga EJ. Risky behaviours among young people living with HIV attending care and treatment clinics in Dar Es Salaam, Tanzania: Implications for prevention with a positive approach. *J Int AIDS Soc* 2013;16:17342.
20. P Nalwa, S Dwivedi, SB Dabral, D Kumar and KG Singh: KAP study of STD patients in a hospital set up. *Ind J Prev Soc Med* 2006;37:58-66
21. Murray, Christopher J. L, Lopez, Alan D and World Health Organization. (1998). *Health dimensions of sex and reproduction: the global burden of sexually transmitted diseases, HIV, maternal conditions, perinatal disorders, and congenital anomalies*/edited by Christopher J. L. Murray, Alan D. Lopez. Boston: Harvard School of Public Health. <https://apps.who.int/iris/handle/10665/42161>
22. Aral SO, Over M, Manhart L, et al. Sexually transmitted infections. In: Jamison DT, Breman JG, Measham AR, et al., editors. *Disease control priorities in developing countries*. 2nd edition. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2006. Chapter 17. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK11734/> Co-published by Oxford University Press, New York.

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