

A Study on Reproductive Tract Infections among Married Women of Reproductive Age Group in Rural Field Practice Area of PSM Department, DMCH

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Abstract:

Background: The current study estimates the prevalence of RTIs among married women of reproductive age, and its associated risk factor and assess the treatment seeking behavior among these women.

Methodology: This is a community-based cross-sectional study conducted for a period of 2 year in the rural field practice area of PHC Kalyanpur, under the department of PSM, DMCH. After receiving informed consent, a semi-structured questionnaire was given to the participants. The cluster Sampling method was used for the current project and the study was conducted on 510 women. Data was collected using a pre-written interview schedule (in local language) depicting socio-demographic details of the participants, prevalence of symptoms, awareness about RTIs, assessing the treatment seeking behavior in women with symptoms and in asymptomatic women and the symptoms suggestive of RTIs in the spouse. Data was entered in MS Excel and frequencies, proportions, and percentages were calculated. For statistical measurement, SPSS version 20 software was used.

Result: Among 510 married women the prevalence of symptoms suggestive of RTI was found to be 35.5 %. Lower abdominal pain, Genital Ulcer, Lower backache, swelling in the groin, Pain during urination, and Itching in the genital were common symptoms reported in the study.

Conclusion: RTI still remains ignored by married women. Different training, advertisement and education session should be conducted to identify the early symptoms of RTI. Awareness about safe sex, marriage, and pregnancy after 19 yrs of age, delivery at hospitals in the presence of doctors, menstrual and personnel hygiene, and use of the condom are needed for prevention of RTI.

Keywords: RTI, STI, Women of reproductive age.

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Introduction

Reproductive health encompasses all aspects of total physical, mental, and social well-being. In underdeveloped nations, reproductive tract infections are common and severely impact women. [1] The second-ranking issue in terms of public health concerns is the universal health problem. [2] It causes 17% of the economic loss in emerging nations. [2] Although RTIs negatively impact women's social welfare during their most productive years, this issue is mostly disregarded by the medical community at now. [3] Morbidity and mortality due to poor reproductive health are highest among poor women over the world mostly belonging to developing countries. It was further

seen that women have poor concern regarding their own health and poor compliance to its management. [4]

The World Health Organisation (WHO) defines a reproductive tract infection (RTI) as an infection of the reproductive tract that can cause death in sexually active women of reproductive age. [5] Symptoms range from a dull aching in the back to sharp discomfort in the lower abdomen, and can also include genital ulcers, vulval itching, inguinal enlargement, and irregular vaginal discharge. *Treponema pallidum*, *Chlamydia trachomatis* (CT), *Neisseria gonorrhoeae* (NG), and *Trichomonas vaginalis* are the most frequent pathogens linked

with STIs, while bacterial vaginosis (BV) is a rising concern among RTIs.[6,7] If left untreated it can lead to complications like pelvic inflammatory disease, infertility, cervical cancer, chronic pelvic pain, ectopic pregnancy, and pregnancy wastage .[6] The World Health organization is assisting the different nations for estimating the prevalence. The most up-to-date estimate puts the number of yearly STI cases over the world at a standstill at 1 million. However, the availability of data varies greatly amongst Asian nations. It has been estimated that 6 percent of adult women in India are living with active STI infections. Infectious diseases caused by RTIs are a global hidden epidemic with serious health and economic effects.[8]

The World Health Organisation predicts that 374 million new cases of treatable STIs will be diagnosed in 2020. This includes 129 million cases of chlamydia, 82 million cases of gonorrhoea, 7.1 million cases of syphilis, and 156 million cases of trichomoniasis.[9] Most of these occurrences 75%–85% occur in third-world nations like India.[10] A/C to NHP 2019, In India the annual incidence of RTI and STIs is 5-6 % (50-60 million population) .[11] One in ten Indian women in their reproductive years reported having a sexually transmitted infection or STI-like symptoms in the 12 months before to the NFHS 4 survey in 2015–16 .[12] According to Bihar's DLHS 3 survey from 2007-2008, Overall, 21.5% of married women (15-49 years) reported experiencing symptoms of an RTI/STI (21.4% in rural regions and 22.5% in urban areas).[13] In Darbhanga according to DLHS 3, HIV/AIDs and RTI/STI awareness rate among ever married women (15-49 year) was 29.4% (27% in rural areas) and 35% (34.3% in rural areas) respectively.[13,14] Various factors associated with RTIs are biological, behavioural, social and medical factors. Some other factors associated include poor education, Occupation, poor socio economic Status, marital status, age at marriage, parity, sexual history, contraceptive methods, Mode and place of delivery or abortion, Bad outcomes of pregnancy in the last one year like Abortion or Intrauterine Deaths, Menstrual history and Menstrual hygiene, Personal hygiene.[15]

Despite the fact that early diagnosis and treatment of RTIs can prevent complications and reduce the severity of the infection, many women wait until the symptoms become unbearable before seeking medical attention, so RTIs go untreated for a long time. Cultural hurdles, misunderstanding of symptoms, loss of privacy, absence of a female doctor at the health facility, excessive expense of care, social stigma, and apprehension of an internal checkup can all delay a person's decision to seek help.[6] Prevalence rate of particular geographical region are need to be accessed to help health administrators; so that they can provide required

treatment to the patients. Due to the paucity of research in this area, the PSM department at DMCH decided to perform this study on RTI among rural, childbearing-age women. The prevalence and awareness regarding RTI among the study population will be assessed along with their treatment seeking behaviour for the same which will help in providing better services for their treatment and control.

Materials and Methods

Study Design: Community based cross sectional study.

Study Period: January 2021 to December 2022

Study Area: The current study was conducted in the rural field practice area of PHC Kalyanpur, under the department of PSM, DMCH

Study Population

Married women of reproductive age group residing in rural field practice area of PSM department, DMCH. Inclusion and exclusion criteria were set as follows:

Inclusion Criteria

1. Married women of reproductive age group (15-49 years).
2. A permanent resident of the study area.

Exclusion Criteria

1. Women not willing to participate.
2. Women who were critically ill.

Sampling Method

Cluster sampling method was used for the current project.

Sample Size

According to Durai V et al 2019, prevalence of RTI among women of reproductive age group fell around 21% [3]. At 95% confidence interval, sample size $(n) = z^2 \cdot \frac{p \cdot q}{d^2}$

Where $z = SD$ at 95 % of confidence interval = 1.96

$p = \text{prevalence} = 21\%$

$q = 1 - p = 79$

$d = \text{margin of error} = 25\% = 5.25$

Putting the values in the above formulae,

$n = 232$

Considering design effect of cluster sampling 2 and non-response rate of 10%, final sample size was 512; rounding it off to nearest value which was 510 Considering non-response rate of 10%, final sample size will be 510.

Sampling technique

The Cluster sampling method was done considering single researcher and limited resources. There are a total of 123 villages in Kalyanpur, out of which 30

villages were selected randomly for this study. 17 eligible subjects were selected and to reach a total of 510 study subjects.

Data Collection

Each selected village was visited and ASHA and other local health workers were contacted. A health team consisting of researcher, ASHA and other local people was constituted. Transect walk was done from a randomly selected centre of village to select first house and then a house to house survey was done to obtain 17 eligible study subjects. Second visit was done if the subject was not present at home during survey, then if on second visit subject was not present we selected another house for inclusion in the study.

Data was collected using a pre-written interview schedule (in local language) depicting socio-demographic details of the participants, prevalence of symptoms, awareness about RTIs, assessing the treatment seeking behaviour in women with symptoms and also in asymptomatic women and the symptoms suggestive of RTIs in the spouse. The diagnosis of RTIs was made as per the guidelines of WHO.

Data Analysis

Data was entered in MS Excel and frequencies, proportions, percentages were calculated. For statistical measurement, SPSS version 20 software was used.

Result

A total of 510 women were interviewed for this study. The majority of the study's female participants were between the ages of 31 to 35 (25.88%), with the next largest group being between the ages of 26 to 30 (25.68%) followed by 36–40 year olds (17.45). Seventy-nine percent of the women who participated in the study were married. A majority (52.16%) of the participants were married after the age of 18, while (47.84%) of them were married before. 76.80% of the participants were Hindus, whereas 23.20% were Muslims. The participants' educational backgrounds depicted that 9.60% of the population was illiterate, 10.4% had finished Grade, 15.88% had reached Mid-School (up to 8th grade), and 21.37% had completed 1 to 5 years of formal education (Primary School) and 42.75% had completed 6 to 10 years (High School). The Occupational status showed that 17.06% (87) of the women were working and (82.94%) (423) were not working. In rural areas, socioeconomic status was determined by monthly per capita income using the Modified BG Prasad scale (2020). They were categorized as shown in table 1, which placed 36 (7.06 %) individuals in Class I, 97 (19.02 %) people in Class II, 186 participants (36.47 %) in Class III, 85 (16.67 %) participants in Class IV, 106 (20.78 %) participants in class V. All the above background characteristics were shown in table 1.

Table 1: Background characteristic of the study population

Characteristic	Number (n=510)	Percentage (%)
Age		
18 to 20 years	34	6.67
21 to 25 years	82	16.07
26 to 30 years	131	25.68
31 to 35 years	132	25.88
36 to 40 years	89	17.45
41 to 45 years	28	5.49
46 to 50 years	14	2.74
Marital status		
Living with husband	403	79.02
Widowed	25	4.90
Separated or divorced	82	16.08
Age at marriage		
Less than 18 years	244	47.84
18 years and above	266	52.16
Characteristics	Number n=510	Percentage (%)
Religion		
Hindu	392	76.80
Muslim	118	23.20
Participant education status		
Illiterate	49	9.60%
Graduate	53	10.4%
Primary School	109	21.37%
Mid School	81	15.88%

High School	218	42.75%	
Occupational status			
Working	87	17.06%	
Not working	423	82.94%	
Socioeconomic status			
Status	Socioeconomic class	Number (n = 510)	Percentage (%)
Upper middle	Class I	36	7.06
Upper	Class II	97	19.02
Middle	Class III	186	36.47
Lower middle	Class IV	85	16.67
Lower	Class v	106	20.78

The prevalence of symptoms of RTI among married women of reproductive age in the study population was found to be 35.5 %. Among 510 women, 35.5 % had experienced RTI and showed two or more symptoms as shown in table 2.

Table 2: Prevalence of symptoms suggestive of reproductive tract infections

No of symptoms	Number (n=510)	Percentage (%)
No symptoms	329	64.5%
Symptoms shown	181	35.5%
Total	510	100 %

Most common experienced symptoms suggestive of RTI were shown in table 3. This includes Abnormal vaginal discharge (30.8%), Lower abdominal pain (32%), Genital Ulcer (5.68%), Lower backache (13.92%), Swelling in the groin (1.76%), Pain during urination (15.68%) and Itching in genital regions (32.94%). The number and percentage of women showing symptom are shown in table 3.

Table 3: Distribution of symptoms suggestive of RTI among women

Symptoms	Number (n=510)	Percentage (%)
Abnormal vaginal discharge	157	30.8%
Lower abdominal pain	163	32%
Genital Ulcer	29	5.68 %
Lower backache	71	13.92 %
Swelling in the groin	9	1.76 %
Pain during urination	80	15.68 %
Itching in genital regions	168	32.94%

Factors which showed significant association with the prevalence of RTI in the present study include age, use of contraception, parity, mode of delivery, menstrual cycle and material used in menses. Insignificant data was obtained in relation with religion, birth method and person involved in birth.

Different risk factor associated with RTI include sociodemographic factors (table 4), menstrual hygiene related factors (table 5) and Marital and reproductive status (table 6) as risk factors for RTI.

Table 4: Sociodemographic related factors

Variables		Had RTI	NO RTI	χ^2	p value
Age	18 - 20	6 (3.31%)	28	42.659	<0.05 (significant)
	21 -25	23 (12.71%)	59		
	26 -30	39 (21.55%)	92		
	31- 35	65 (35.91%)	67		
	36 -40	39 (21.55%)	50		
	41 -45	0(0.00%)	28		
	46 - 50	9(4.97 %)	5		
Educational status	Illiterate	31 (17.12 %)	18	39.03	0.0001 (Significant)
	Primary School	73 (40.33 %)	36		
	Middle School	37 (20.44 %)	44		
	High School	32 (17.68 %)	186		
	Graduate	8 (4.42 %)	45		

Occupation	Working	35 (19.34 %)	52	1.029	0.3103 (Not significant)
	Not working	146 (80.66%)	277		
Religion	Hindu	139 (76.80 %)	253	0.00071	0.9787 (Not significant)
	Muslim	42 (23.20 %)	76		
Socioeconomic	Upper (Class I)	32 (17.67 %)	4	76.031	0.0000 significant
	Upper middle (Class II)	38 (20.99 %)	59		
	Middle (Class III)	46 (25.41 %)	140		
	Lower Middle (Class IV)	44 (24.30 %)	41		
	Lower (Class V)	21 (11.60%)	85		

Sociodemographic factor associated with RTI: Women in the 31-to-35-year age group were found to have the highest prevalence of RTI among research participants, followed by those in the 26 to 30 year and 36–40-year age group with a little difference. RTI prevalence is highest among Hindus (76.80 %), followed by Muslims (23.20 %). The ladies in Class III had a higher RTI prevalence. The participants' educational status and RTI had a strong correlation while insignificant correlations was seen between participant occupational status and RTI prevalence. Table 4 suggest different sociodemographic factor associated with RTI.

Menstrual hygiene related factors: The association of prevalence of RTI and menstrual cycle, types of material used during menses and taking bath was found to be statistically significant and are associated with the prevalence of RTI. 80.55% women with regular menses, a total of 244 women who used sanitary pads and 218 women who do take shower during menses do not have RTI (table 5).

Table 5: Menstrual hygiene related factors

Variables		Had RTI	NO RTI	χ^2	p value
Menstruation cycle	Regular	112 (61.88%)	265 (80.55%)	21.109	0.00000434 (Significant)
	Irregular	69 (38.12%)	64(19.45%)		
Type of material used during menstruation	Sanitary Pads	69 (38.12%)	244 (74.16%)	132.63	<0.0001 (Significant)
	Cloth	112 (61.88 %)	46 (13.98%)		
	Both	0 (0 %)	39 (11.85%)		
Shower	Taking bath	133 (73.48%)	218 (66.26%)	2.836	0.092 (Not Significant)
	No bath	48 (26.52%)	111 (33.74%)		

Marital and reproductive status as risk factors for RTI: The prevalence of RTI was more among the women who did not use contraceptive. This relationship was found significant. The prevalence of RTI was lowest among OCP and Tubectomy and highest among IUCD users (9.09%). This association was statistically significant. RTI was

more common in women who were not pregnant. The prevalence of RTI was more among the women who has 2 children or 5 children. This relationship was found significant. The prevalence of RTI was more among the women whose deliver mode was through vaginal. This relationship was found significant.

Table 6: Marital and reproductive status as risk factors for RTI

Variables		Had RTI	NO RTI	χ^2	p value
Age at marriage	< 18 years	78 (43.09%)	166 (50.46%)	2.536	0.111 3 (Not significant)
	≥ 18 years	103 (56.91%)	163 (49.54%)		
Age at which first pregnancy happened	< 20 years	76	135	54.00	<0.001 (Significant)
	≥ 20 years	78	157		
Place of delivery	Nil			1.881	0.170 (Not significant)
	Home	73 (40.33%)	90 (33.96%)		
	Hospital	108 (59.67%)	175 (66.04%)		
Last delivery conducted by different worker	Nil			0.25	0.617 (Not significant)
	Health Worker	130 (71.82%)	196 (73.96%)		
	Non-Health Worker	51 (28.18%)	69 (26.04%)		
Mode of the last	Caesarean	46 (25.41%)	86 (32.45%)	2.557	0.109 (Not Sig-

delivery					nificant)
	Vaginal delivery	135 (74.59%)	179 (67.55%)		
History of abortion	No	134 (74.03%)	212 (64.44%)	4.928	0.0264(Not significant)
	Yes	47 (25.97%)	117 (35.56%)		
Type of abortion	Nil			0.592	0.441 (Not Significant)
	induced	4(18.18%)	8 (11.76%)		
	spontaneous	18 (81.82%)	60 (88.24%)		
Types of contraceptives used	None	151 (83.42%)	211 (64.13%)	49.562	0.000 (Significant)
	IUCD	18 (9.95%)	11 (3.35%)		
	Condom	12 (6.63%)	89 (27.05%)		
	OCP	0	11 (3.35%)		
	Tubectomy	0	7 (2.12%)		
Number of child distribution	< 2 children	48 (26.52%)	110 (33.43%)	31.346	0.000081 (Significant)
	≥ 2 children	133 (73.48%)	219 (66.57%)		
Status of Pregnancy	Yes	11	53	10.708	0.0010 (Significant)
	No	170	276		

RTI was more common in women whose most recent birth method was in a hospital. This relationship was not found significant. RTI was more common in women whose most recent birth had been handled by a medical professional. The association of prevalence of RTI and types of abortion was also not statistically significant.

Discussion

This study was carried out to estimate the prevalence of RTIs among married women of reproductive age group residing in rural practice area under PSM department Darbhanga Medical College, Bihar to know about the factors associated with RTIs among these women and to assess the treatment seeking behavior among these women.

Prevalence of RTI

181 out of the 510 women who took part in the research said they had experienced two or more than two of the symptoms associated with RTIs or STIs. With a 95% confidence range, the reported prevalence of RTIs was 35.5%. The prevalence recorded in Veerapandi Panchayat is lower than this estimate, with a 95% confidence interval including this value.[16] A greater prevalence (46%), as reported by Singh S. et al., was also found in rural Maharashtra.[17] The research location is rural and close to Darbhanga, therefore it's possible that these factors contributed to the decreased frequency seen there. In spite of the fact that it is a well-known fact that the number of people who have Internet access is on the rise, the percentage of people who use it is even greater.[18] The majority of women reported experiencing vaginal discharge (157, or 30.8%), followed by dysuria (80, or 15.68 %). Vaginal discharge was the commonest symptom reported in other studies in rural areas by Patel

et al. [19], Samanta A et al. (West Bengal)[20], and Kosambiya et al. (Surat).[21]

Sociodemographic characteristics and RTI

There was a statistically significant correlation ($P < 0.05$) between the age groups 31-35 years (35.91%), 26-30 (21.55%) and 36-40 (21.55%) for the prevalence of RTI symptoms. Similarly, Sharma et al. found a statistically significant peak frequency among adults aged 25 to 34. Kosambiya et al. in Surat have found a similar correlation. The frequency rises with age, as observed by Rathore et al. Possible explanations for the discrepancy in this study include differences in the ages of the study groups (31-35 years), inherent biological variability, and a general lack of knowledge among women in the 36-40 years and 26-30 years of age range. [21,22,23]

There was no statistically significant correlation between the frequency of RTI and age of marriage (less than 18 years and more than 18 years old). However, research using NFHS 2 (1998-99) data found that the frequency of RTI was greater among spouses who had been married for less than 15 years than among those who had been married for more than 19 years. The percentage of women who tied the knot before turning 18 was lower in this analysis (47.84 %).

Obstetric history and RTI

Statistically significant correlation between the rate of RTI and the birthrate can be seen in this study. Kumar et al. (1997-1998) [24] and Rathore et al. [23] reported a significant association between RTIs and the number of conceptions and live births. Improved Reproductive health care may add in reducing the correlation between RTI and birth rates. Women who had less than two live births were in

the minority as well (26.52%).

Despite a substantial correlation between RTI and abortion rates in the NFHS 2 data provided by Agrawal S. et al., this analysis showed no evidence of a link between the two ($P=0.441$). This study's results may be different because of the high quality and low risk abortion services in the Darbhanga area.[24]

Contraceptive practices and RTI

There was a statistically significant difference between the women who had ever used a contraceptive and those who had never used one. The rate of RTI was found to be highest with the women who had never used any contraceptive measures. There was also a large disparity between the various forms of birth control. Among the user of contraceptive measures, the rate was lowest among tubectomy and OCP users, highest among IUCD users followed by condom users. This data suggests that different contraceptive measures may have played a preventive effect in avoiding RTIs.

There was a correlation between using a contraceptive and the incidence of RTI. IUCD users had the highest rate of RTI prevalence (9.95 %) followed by users of condoms (6.63%) whereas tubectomy and OCP users had no cases of RTI. Similar results have been observed by many groups (Kumar et al., Rathore M et al. in rural Rajasthan, Sharma S et al. in West Bengal, and Ravindran TKS et al. in Dharmapuri district, Tamil Nadu).[22,23,24,25]

These results point to a clear protective function played by male condoms in avoiding RTIs. Copper T (IUCD) use is more common among women; however, this trend may be attributable to inadequate post-insertion care.

Personal and Menstrual Hygiene practices and RTI

Using a toilet to urinate and cleaning one's privates after peeing were the two factors considered in determining the correlation between personal hygiene and RTI. Women who urinate in restrooms and clean themselves afterward are less likely to get RTIs than those who do not. Riyami AL et al. discovered that poor cleanliness among Omani women was linked to RTIs; Yang LR et al. found the same thing in rural China; and Singh S et al. found the same thing in rural Dehradun. [26,27,17]

The correlation between the kind of menstruation serviette used and RTI symptoms was substantial. Women who used handmade or cotton pads had a greater frequency of RTI (61.88 %), whereas women who had used proper sanitary pad were found to be lesser rate of RTI (38.12%) It was determined that this connection was substantial. Riyami et al., Yang LR et al., and Singh S et al. have all reported similar associations. This link implies that maintaining

good menstrual hygiene might help avoid RTIs.[26,27,17]

This study demonstrates that despite the multiple government initiatives to stop the spread of RTIs, rural regions continue to experience a large RTI problem, with a prevalence of 35.5% as determined by symptoms. RTI symptoms were shown to be substantially correlated with participant age, marital status, previous and present contraceptive usage, and menstrual and personal hygiene practises. This study emphasises the necessity for awareness programmes and health education among women since these variables may be changed through health education and counselling.

Conclusion

RTI symptoms were more prevalent in those aged 31-35 year age group. Girls and young women alike should be taught proper menstruation and personal hygiene techniques. Through advertisements or other government programmes, it should be encouraged that young married women use contraceptives and practise good personal and menstrual hygiene, as well as to delay marriage until their early 20s. IUD implantation should be followed up with routine treatment. The use of proper contraceptive measures for RTI prevention should be encouraged. So the awareness related to prevention of RTI as well as the various contraceptive use should be promoted either through education or advertisement especially for rural area as women are not much educated about the awareness of personal hygiene during menstrual cycle and hence chance of prevalence of RTI increases.

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References

1. Rabi KA, Adewunmi AA, Akinlusi FM, Akinola OI. Female reproductive tract infections: understandings and care seeking behaviour among women of reproductive age in Lagos, Nigeria. *BMC women's health*. 2010;10:1-7.
2. Rajamani S. An experimental study to assess the effectiveness of planned teaching program on knowledge regarding reproductive tract infections (RTI) among adolescent girls in selected schools of Jind, Haryana. *International Journal of Nursing Education and Research*. 2021;9(2):218-22.
3. Durai V, Varadharajan S, Muthuthandavan AR. Reproductive tract infections in rural India—A population-based study. *Journal of*

- family medicine and primary care. 2019;8(11):3578.
4. Chattu VK, Yaya S. Emerging infectious diseases and outbreaks: implications for women's reproductive health and rights in resource-poor settings. Springer; 2020. p. 1-5.
 5. Kafle P, Bhattarai SS. Prevalence and factors associated with reproductive tract infections in gongolia village, Rupandehi district, Nepal. *Advances in Public Health*. 2016;2016.
 6. Tibary A, Pearson LK, Fite CL. Reproductive tract infections. *Equine infectious diseases*. 2013;84-106.
 7. Prasad JH, Abraham S, Kurz KM, George V, Lalitha M, John R, et al. Reproductive tract infections among young married women in Tamil Nadu, India. *International family planning perspectives*. 2005;73-82.
 8. Bhilwar M, Lal P, Sharma N, Bhalla P, Kumar A. Prevalence of reproductive tract infections and their determinants in married women residing in an urban slum of North-East Delhi, India. *Journal of natural science, biology, and medicine*. 2015;6(Suppl 1):S29.
 9. Martins JLR, Pinto EMH, Oliveira SA, Gomes FAC, Silva ON. Treatment of Sexually Transmitted Infections (STIs) Caused by *Neisseria gonorrhoeae* and the Global Shortage of Antibiotics. *Venereology*. 2022;1(3):235-44.
 10. About S, Buhalata SN, Onduru OG, Chiduo MG, Kwesigabo GP, Mshana SE, et al. High Prevalence of Sexually Transmitted and Reproductive Tract Infections (STI/RTIs) among Patients Attending STI/Outpatient Department Clinics in Tanzania. *Tropical Medicine and Infectious Disease*. 2023;8(1):62.
 11. Patel NJ, Mazumdar VS. The current status of sexually transmitted infections/reproductive tract infections in Vadodara City: Health-care provider perspective. *Indian Journal of Community Medicine: official Publication of Indian Association of Preventive & Social Medicine*. 2019;44(3):247.
 12. Shri N, Muhammad T. Association of intimate partner violence and other risk factors with HIV infection among married women in India: Evidence from National Family Health Survey 2015–16. *BMC public health*. 2021;21(1):1-11.
 13. Mondal K, Shekhar C, editors. Reproductive Morbidity and Treatment Seeking Behaviour of Currently Married Women in Eastern States of India. *Selected Papers of Bhopal Seminar* 2012; 2013.
 14. Akhter K, Priyadarshini As, Dey S, Singh D. Reproductive Tract Infection In Women Attending Obstetrics And Gynaecology Department of a Tertiary Care Hospital In Bihar. *Journal of Evolution of Medical and Dental Sciences-Jemds*. 2018;7(14):1756-9.
 15. Liu J, Zeng M, Yang L, Mao Y, He Y, Li M, et al. Prevalence of reproductive tract infections among women preparing to conceive in Chongqing, China: trends and risk factors. *Reproductive Health*. 2022;19(1):1-9
 16. Kannan C, Athmaraman T, Nayeem A, Sang-eetha S, Sudha R, Ponsuganthi K, et al. Prevalence of reproductive tract infections among recently married women in Veerapandi Panchayat union of Salem district, Tamil Nadu. *Indian Journal of Community Medicine*. 2007;32(2):144-5.
 17. Singh S, Singh S, editors. Reproductive morbidity among the Rural women in Maharashtra. MPS Seminar; 2006.
 18. IIPS. District Level Household Survey (DLHS-3), 2007-08: India. International Institute for Population Sciences Mumbai; 2010.
 19. Patel V, Pednekar S, Weiss H, Rodrigues M, Barros P, Nayak B, et al. Why do women complain of vaginal discharge? A population survey of infectious and psychosocial risk factors in a South Asian community. *International Journal of Epidemiology*. 2005;34(4):853-62.
 20. Samanta A, Ghosh S, Mukherjee S. Prevalence and health-seeking behavior of reproductive tract infection/sexually transmitted infections symptomatics: a cross-sectional study of a rural community in the Hooghly district of West Bengal. *Indian journal of public health*. 2011;55(1):38.
 21. Kosambiya J, Desai VK, Bhardwaj P, Chakraborty T. RTI/STI prevalence among urban and rural women of Surat: A community-based study. *Indian journal of sexually transmitted diseases and AIDS*. 2009;30(2):89.
 22. Sharma S, Gupta B. The prevalence of reproductive tract infections and sexually transmitted diseases among married women in the reproductive age group in a rural area. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*. 2009;34(1):62.
 23. Rathore M, Swami S, Gupta B, Sen V, Vyas B, Bhargav A, et al. Community based study of self reported morbidity of reproductive tract among women of reproductive age in rural area of Rajasthan. *Indian J Community Med*. 2003;28:117-21.
 24. Kumar CS, Gupta S, Kumar D, Singh J, Bhawsar R. Reproductive tract infections and their associated risk factors among the women in Bundi District of Rajasthan. *Journal of Human Ecology*. 2002;13(4):307-10.
 25. Ravindran TS, Balasubramaniam P, Mini G. Inequities in health in Tamil Nadu: A study of Dharmapuri District. *Rural Women's Social*

- Education Centre (RUWSEC) www.ruwsec.org/uploads/54.pdf. 2014.
26. Al Riyami A, Afifi M, Fathalla MM. Gynecological and related morbidities among ever-married Omani women. *African Journal of Reproductive Health*. 2004;188-97.
27. Yang LR, Zhao H, Wang HP, Li Y, Niu JP, Su KJ, et al. Improving ability of married women to prevent reproductive tract infections in rural western China. *Environmental health and preventive medicine*. 2006;11(5):233-40.