



## ORIGINAL ARTICLE

# Reproductive Tract Infections and Treatment Seeking Behavior among Married Adolescent Women 15-19 Years in India

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## ABSTRACT

**Background:** India is home to the highest number of adolescents in the world. Adolescents in India suffer from lack of knowledge and empowerment to make informed sexual and reproductive health decisions. This paper analyses the prevalence of reproductive tract infections and sexually transmitted infections (RTI/STI) and treatment seeking behavior among married adolescent women in India aged 15-19 years.

**Methods:** Data from the District Level Household Survey (DLHS, 2007-08) of India were used. The prevalence of RTIs symptoms and treatment seeking behavior among women by different socio-demographic characteristics was analyzed. Factor analysis was utilized to create an index using information about 11 symptoms of RTI/STI collected in the survey. Linear and binary logistic regressions were used to know the association between infections and treatment seeking behavior with socio-demographic factors.

**Results:** About 15 percent of adolescent women reported having any symptoms of RTI/STI. The main symptoms reported were low backache, pain in the lower abdomen, pain during intercourse and itching or irritation around the vulvar region. Factor analysis showed the concentration of diseases in three clusters - infection in around the vulva, other reproductive infection and abnormal discharge; and intercourse related problems. Major predictors of both symptoms of reproductive infections and treatment seeking behavior from multivariate analysis are age, education, wealth, region and awareness about RTI/STI.

**Conclusions and Public Health Implications:** Knowledge and treatment seeking behavior is poor among adolescent women in India. There is need for programmatic and policy emphasis on increasing knowledge and awareness through family life education including in educational curriculum at school level.

**Key Words:** Married Adolescents • Reproductive tract infections • Health Behavior, • Treatment • India

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## Introduction

Owing largely to early marriage, adolescent women in India become sexually active at an early age and face tremendous social and familial pressure for child bearing soon after marriage, a situation that leads to multiple reproductive health problems<sup>[1]</sup>. Many of them lack knowledge about proper use of family planning methods and safe abortions. The improper use of contraception, intrauterine devices (IUD) insertion in the presence of infections, female sterilization in unsterile condition, and unsafe abortion also increases the risks of RTIs<sup>[2-4]</sup>. These infections are often asymptomatic, or the symptoms are not recognizable. Therefore, RTIs are generally seen as a 'silent' epidemic and are among the leading public health problems significantly contributing to gynecological morbidity and maternal mortality in India and other developing countries<sup>[5]</sup>. Moreover, in India, women with self-reported symptoms of reproductive morbidity do not seek treatment due to existing taboos and inhibitions regarding sexual and reproductive health. They hesitate to discuss their reproductive health problems especially, due to shame and embarrassment<sup>[6-7]</sup>.

Untreated infections are among the underlying causes of Pelvic Inflammatory Diseases (PID), ectopic pregnancy, infertility, cervical cancer, fetal loss, health problems of new born, and increased risk of HIV transmission. In addition to health consequences, women experience social consequences in terms of emotional distress related to gynecological morbidity<sup>[8]</sup>. As most of these illnesses progresses to a chronic state and remain with women for the rest of their lives, the importance of early detection and management becomes much more evident.

The prevalence of RTI infections is low in India<sup>[9]</sup>; however, the number of adolescent affected by infections is a real concern due to the large adolescent population. India has the largest proportion of adolescents (more than 243 million) in the world, accounting for almost 20 per cent of the country's population.<sup>[10]</sup> Around 340 million incidences of curable STIs are diagnosed each year, out of which 151 million are from South and Southeast Asia<sup>[11]</sup>. Furthermore, two third of all STIs occur among young and adolescent people who are in their early twenties<sup>[12]</sup>.

Until now, very few studies have focused on reproductive tract infections (RTI) or sexually

transmitted diseases (STIs) among adolescent women in developing countries such as India. A study conducted in southern Indian state of Tamil Nadu on young married women aged 16-22 years in a rural community reported a very high level of morbidity<sup>[14]</sup>. The study showed that more than half of the women were suffering from at least one or more RTIs<sup>[14]</sup>. Similarly, very few attempts have been made to study the health seeking behavior for reproductive morbidity of adolescent women in India<sup>[1, 13-14]</sup>. One of the studies explained the familial influence in treatment seeking behavior of married adolescents in Maharashtra, a western state of India<sup>[1]</sup>. However, most of the studies are micro-level data collected from districts or regions. Therefore, the present study focuses on knowledge and prevalence of reproductive tract infection among married adolescent women using a national level large scale data with a special attention on different categories of infection and treatment seeking behavior. More importantly, this study attempts to group the symptoms by factor analysis and to examine the factors associated with symptomatic clusters.

## Methods

The study uses data from third round of the India District Level Household Survey (DLHS)<sup>[15]</sup>, which provides district level information about reproductive and health care of women aged 15-49. The survey was conducted during December 2007 to December 2008. The survey used multistage stratified systematic sampling design and 50 census villages in rural areas and wards from urban areas were selected from each district based on probability proportional size (PPS) sampling<sup>[15]</sup>. In this paper, ever married women aged 15-19 consisting of 39, 164 are considered. Although this age group does not cover the complete gamut of adolescents, this age-group is more suitable for examining the prevalence of RTI and knowledge as most of the adolescents get married and starts active sexual life at this age.

Multiple statistical techniques are used for analysis. Factor analysis was used to create an index using all the 11 symptoms of RTI/STI reported in the survey. Factor analysis is generally used for the determination of a small number of factors based

on a particular number of inter-related quantitative variables. Cross tabulation were used to explore the prevalence of RTIs symptoms and treatment seeking behavior among women by different socio-demographic, medical and behavioral characteristics. In this study, we tried to find statistical association between different type of symptoms of RTI/STI among adolescents married women in India and reduced the numbers of factors using principal component analysis method of factor analysis. Simple linear regression was used to know the relation between different types of infections and socio-demographic medical and behavioral characteristics. The explanatory variables are: religion, caste, educational levels, type of house, age of women, age at marriage, abortion, children ever born, contraceptive users, aware of RTI/STI. In order to estimate the net effect of each variable on the probability of seeking treatment or consultation, binary logistic regression model was used.

### **Ethical Statement**

This study used District Level Household Survey dataset which is conducted by International Institute for Population Sciences (IIPS) and funded by Ministry of Health and Family Welfare (MoHFW), Government of India (GoI). The questions in the survey were approved by both IIPS and MoHFW. Informed consent was obtained from the respondents before the interviews were conducted. The authors have no role in data collection.

## **Results**

### *Awareness of Reproductive Tract Infections among Adolescent Women*

In the present study, we found that awareness among married adolescent women is very low with only one-fourth (25%) of them are aware of any symptoms of RTI/STI. The awareness among older women is better than the adolescent women (table 1). Unsafe sex with persons having many partners (60%) is the most perceived mode of transmission among women in India. Knowledge of other modes of transmission like unsafe delivery, unsafe abortion, unsafe IUD insertion and unsafe sex with homosexuals is low among adolescent women

than their adult counterparts. The awareness of any RTIs/STIs' symptoms is low among married adolescent women in rural areas (24%) than in the urban areas. However, only 31 percent of the urban adolescent women in India are aware of any RTIs/STIs' symptoms. Less percentage of younger, illiterate and women from poorest wealth quintiles are aware of RTI/STI as compared to older, higher educated and women from richest wealth quintile respectively (table not shown).

### *Prevalence and Duration of Symptoms*

Among the adolescent women, around 15 percent reported having any symptoms of RTIs/STIs and 11 percent reported having abnormal vaginal discharge in the last three months of the survey. Low backache (8 %), pain during sexual intercourse (5 %), pain in the lower abdomen not related to menstruation (5%), itching or irritation over the vulva (4%), pain on urination or defecation (2.5 %) and boils/ulcers/warts around the vulva (1.6%) are the major problems reported by married adolescents. The result shows that more than half of the adolescent women have at least one reproductive infections for more than three months. The proportion of other morbidities varied from 46 to 60 percent. Low backache, and swelling in the groin is most neglected by more than 60 percent of women reporting the symptoms exist for more than 3 months.

### *Factor Analysis*

Some of the infections may exist due to other type of infections or may simultaneously exist together. In order to understand the association between different symptoms, we used factor analysis using all eleven symptoms of RTIs/STIs reported by adolescent women. Using principal component analysis method, we found three factors with factor score of above 0.4. The factors are a) Infections in and around the vulva i.e. boils/ulcers/warts around the vulva, painful blister like lesions in and around the vagina, itching or irritation over the vulva and swelling in the groin. All the symptoms in the first factor are in around the vulva and mostly lower tract infections. b) Other reproductive infection related to the upper tract of the vagina like pain in the lower abdomen not related to menses, pain during urination and defecation and low backache. Abnormal vaginal discharge which is a lower tract

**Table 1. Knowledge of different mode of transmission of RTI/STI of ever married women by their age groups, India, 2007-08**

Awareness	Age of Women (in years)			
	Adolescent 15-19	Young 20-24	Older 25+	Total 15-49
Aware of RTI/STI	25.2	30.9	31.9	31.8
Knowledge of transmission of RTI/STI				
Unsafe delivery	19.4	22.3	23.5	23.2
Unsafe abortion	13.3	16.9	18.1	17.7
Unsafe IUD insertion	10.3	13.5	15.3	14.8
Unsafe sex with homosexual	11.2	14.6	15.5	15.2
Unsafe sex with persons having many partners	59.9	63.3	61.3	62
Unsafe sex with sex worker	26.4	28.0	28.9	28.6
Others	18.8	14.6	14.6	14.8

**Table 2. Percentage of adolescent married women reporting different symptoms of RTIs/STIs and the duration of the illness, India, 2007-08**

Problems during last 3 months	% Women Suffering <sup>a</sup>	Duration of Illness <sup>b</sup>		N
		< 3 Months	> 3 Months	
Any RTI/STI symptoms*	14.9	39.3	54.8	9661
Abnormal discharge	11.0	26.3	56.1	7127
Low backache	7.9	33.6	60.0	5154
Pain during sexual intercourse	5.2	38.2	56.4	2968
Pain in LA not related to menses	4.8	35.4	57.6	3153
Itching or irritation over vulva	4.3	43.7	51.1	2836
Pain on urination or defecation	2.5	40.2	55.0	1626
Boils/ulcers/warts around vulva	1.6	41.8	53.3	1036
Spotting after sexual intercourse	1.2	46.7	46.5	673
Swelling in the groin	0.8	32.3	60.2	504
Painful blister like lesions	0.6	39.8	51.7	408

\*excluding abnormal discharge. <sup>b</sup>Total duration is not 100% because of don't know and missing cases. LA=Lower Abdomen

infection is also found to be associated with the second factor c) Sexual intercourse related problem of pain and spotting among women.

### Determinants of RTIs/STIs

We used linear regression to understand different socioeconomic and demographic factors affecting these three variables which are in continuous form. Dummy variables were created from categorical socioeconomic variables and age was used as a continuous variable. The result of linear regression shows that following variables have a significant and positive association with lower tract infections,

'use of modern contraception ( $\beta=0.36$ ), abortion ( $\beta=0.4$ ), poorest ( $\beta=0.6$ ) and middle ( $\beta=0.19$ ) quintiles of wealth index; and North-East ( $\beta=0.51$ ), West ( $\beta=0.25$ ), and central ( $\beta=0.13$ ) regions'. Other infections related to the upper tract shows positive and significant association with age ( $\beta=0.04$ ), education, region, the use of modern contraception, abortion, wealth index and regions. The value for use of modern contraception and abortion is 0.18 and 0.67 respectively. While caste status shows a negative association with other infections related to upper tract. The value of scheduled tribes and other backward classes are -0.12 and -0.06 respectively.

**Table 3. Linear regression showing beta values Infection in and around the vulva and other Infection in upper tract problems among women 15-19 years**

Background	Infection in and around vulva ( $\beta$ )	Other Infection in Upper Tract ( $\beta$ )
Age	-0.05	0.04**
No education	0.08	0.13**
Primary	0.01	0.13**
Secondary	0.00	0.05**
Hindu	0.32	0.19**
Muslim	0.17	0.24**
Scheduled castes	-0.01	-0.04
Scheduled tribes	-0.1	-0.12**
Other backward Class	-0.01	-0.06**
Modern contraception	0.36**	0.18**
Abortion	0.40**	0.67**
Poorest	0.60**	0.24**
Poorer	0.18	0.14**
Middle	0.19**	0.09**
Richer	0.09	0.07**
North	0.08	0.30**
North-east	0.51**	0.23**
East	0.1	0.12**
West	0.25**	0.03
Central	0.13**	0.09**

The  $\beta$  of sexual intercourse related problem is not given as none of the covariates are significant in the model.

\* $p < 0.1$  \*\* $p < 0.05$

### *Treatment seeking behavior of RTIs/STIs among married adolescent women in India*

Although premarital sexual relationship is not as prevalent in India as in other countries, early induction into marriage compels women into early and long sexual lives with their husbands at a young age when they are not accustomed to the use of family planning practices and other sexual health education. In this study, we found that treatment seeking among adolescent women is poor. Only 62 percent of the adolescent women discuss the infections with their husbands/partner whereas only one out of four of them go for treatment. Comparing different age groups, the treatment seeking behavior is much higher among older women (25+ years) as compared to the adolescents. This may be due to the fact that

older women enjoy better status in households than younger and newly married women. More than three-fifths of the women preferred private hospitals/clinics as compared to only a little more than one-fourth going to government hospitals for treatment. This may be attributed to privacy, better quality of care, as well as lack of special treatment division for RTIs in government hospitals. More than half the poorest and poorer section of the control prefers to private hospitals or clinics. This shows that going to private hospitals might well be a compulsion rather than choice.

### *Factors Affecting Treatment Seeking Behaviour of Adolescents*

In order to understand the adjusted effect of different socioeconomic and demographic determinants, a binary logistic regression was performed taking "care sought" (No/Yes) as an outcome variable. The result shows that adolescent age, education, religion, caste, wealth index categories, and awareness about RTIs/STIs are significant determinants of her care seeking behavior (table 4). Age, religion, residence, education and wealth are positively associated with treatment seeking of RTIs/STIs of women. The older adolescent women (age 19 years) are two times more likely to seek treatment than the younger adolescent (age 15 years). Muslims (OR=1.45,  $p < 0.05$ ) and other (OR=1.29,  $p < 0.1$ ) religious adolescent women are more likely to seek treatment than the Hindu adolescents. Husband's education also shows significant association and women of higher educated husbands (OR=1.18,  $p < 0.1$ ) have higher odds of seeking care than women of illiterate husbands. The adolescent women with secondary education (OR=1.28,  $p < 0.05$ ) and women in richest quintile of the households (OR=1.39,  $p < 0.05$ ) have a higher chance of seeking treatment than women with no education and women belonging to the poorest households. In comparison to adolescent from the north, the southern adolescent women have a higher odd (OR=1.25,  $p < 0.05$ ) and North-eastern adolescent have a lower odd (OR=0.54,  $p < 0.1$ ) of seeking treatment. Those who are not aware (OR=0.72,  $p < 0.05$ ) of any RTIs/STIs are less likely to seek treatment than those married adolescent aware about the infections.

**Table 4. Logistic regression showing odds ratio the treatment seeking behavior among married adolescents in India**

Background Characteristics	Sought Treatment	Number of Women with any RTI/STI symptoms
<b>Age</b>		
15 <sup>®</sup>		352
16	1.46*	713
17	1.56**	1155
18	1.65**	2794
19	1.97**	2781
<b>Religion</b>		
Hindu <sup>®</sup>		2622
Muslim	1.45**	655
Other	1.29*	2266
<b>Residence</b>		
Rural <sup>®</sup>		1877
Urban	1.13*	1542
<b>Wealth index</b>		
Poorest <sup>®</sup>		2062
Second	1.13	4570
Middle	1.26**	2426
Fourth	1.22*	686
Richest	1.39**	113
<b>Region</b>		
North <sup>®</sup>		6236
North-east	0.84*	1220
East	0.92	339
West	1.02	7218
South	1.25**	577
<b>Aware of RTI/STI</b>		
Yes <sup>®</sup>		2320
No	0.72**	5475

Note: Education of women and their husbands, Children ever born, and Caste are used as control variable in the regression model.

\*p<0.1 \*\*p<0.05 and \*\*\*p<0.01

## Discussion

In this study, we highlight the state of knowledge, prevalence and treatment seeking behavior among married adolescents in India. Awareness of RTIs/STIs among married is very low in India and level of knowledge of RTI is even lower than in other

developing countries including many African countries<sup>[16-17]</sup>. Only one-fourth of the adolescent married women are aware about any mode of transmission considered in the study and this is little higher among the older women. Due to low education and low age at marriage adolescent women are mostly not accustomed to RTIs. Many studies in south-east Asia had also reported low understanding of RTI/STIs among women. For instance, a study in rural Bangladesh reported that only 12% of the study population had the basic understanding of RTIs<sup>[18]</sup>. The study explained this great disparity in the proportion of the various populations who were aware of RTIs could be explained from the rural nature of India and Bangladesh where most of the respondents were illiterates, when compared to the urban settings of Nigeria and Kenya where the literacy level is higher<sup>[16]</sup>. However, we found that only 31 percent of the urban adolescent women in India are aware of any RTIs/STIs' symptoms.

We found around 15% of adolescents have any symptoms of reproductive tract infections. Earlier studies on South Asia found the prevalence of reproductive varies in between 22-92%<sup>[3,6,19-21]</sup>. However, most of these studies included all three types of reproductive morbidities including gynecological morbidities. Most of these infections stayed for more than three months. The factor analysis shows the concentration of diseases in three clusters - infection in around the vulva, other reproductive infection and abnormal discharge; and intercourse-related problems. Multivariate results show that the use of modern contraception and abortion were significantly associated with both infection in around the vulva and other reproductive infection and abnormal discharge. This corroborates the findings from prior studies<sup>[2-4]</sup>.

The treatment seeking for any RTI/STI infections is found to be low in our study. Three-fifths of women discuss RTIs with their husbands/partner but only a little more than one-fourth of them prefers going to seek treatment. This finding is consistent with some of the earlier studies in India which accentuates that the country's health programs which has been special importance to adolescents and youths has failed to reach them<sup>[13, 22-23]</sup>. Our multivariate results shows younger adolescents, rural and poor women are less likely to seek treatment than older urban and rich adolescent women respectively. With respect to

geography, women from northern region and north-eastern women have less probability to seek treatment than their southern counterparts. Those who are not aware of RTI/STI symptoms are less likely to seek treatment. Thus, here is need to focus on rural and poor adolescents with a special focus on strengthening their knowledge about RTI/STI infections.

## Conclusion

The result of this study shows that awareness of life threatening reproductive infections still remains low despite several government efforts in Reproductive and Child health (RCH) programs and the current national rural health mission (NRHM). The awareness remains dismal among adolescent women who have very low knowledge of these infections. Not many of the women are aware that RTIs/STIs can be transmitted through unsafe delivery, unsafe abortion or IUD insertion in the presence of infections. The study found although the prevalence is not very high many of the women ignore these infections for long duration. There exists a strong association between the morbidities which was confirmed by factor analysis.

Furthermore, the number of unqualified and illegal private medical practitioners practicing allopathic medicine and doing abortions has remained the priority among people in the rural areas and small towns of India. People willingly pay for their services rather than availing themselves of free services at the government health facilities. Women rarely use the government health centers than private ones. This underutilization has been described in many other studies.<sup>[24-26]</sup>

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