# Reproductive Tract Infections and Treatment Seeking Behavior among Married Adolescent Women in India

**Ranjan Kumar Prusty**[1]
**Sayeed Unisa**[2]

International Institute for Population Sciences (IIPS),
Govandi Station Road
Deonar, Mumbai-400088
India.

[1]**Research Scholar, IIPS, Mumbai,email:prustyranjan2006@gmail.com**
[2] **Professor, Mathematical Demography and Statistics, IIPS, Email: unisa@iips.net**

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## Introduction

Reproductive Tract Infections (RTIs) including sexually transmitted infections (STIs) present a huge burden and are one of the most challenging public health problems across the globe. Reproductive Tract Infections (RTIs) are caused by organisms normally present in the reproductive tract or introduced from the outside during sexual contact or medical procedures (WHO, 2005). RTIs/STIs causes suffering both to men and women, but their outcomes are more perilous to women due to their physical stature. Biologically, women are more susceptible to most sexually transmitted infections than men, at last in part because of the greater mucosal surface exposed to a greater quantity of pathogens during sexual intercourse. In addition, the risk of transmission of STIs, including HIV infection, is greater whenever the mucosa is damaged. They are also exposed to the infections through unsafe pregnancies, unsafe abortion and improper use of contraception like IUD insertion and female sterilization. Reproductive Tract Infections (RTIs) and Sexually Transmitted Infections (STIs) can have serious consequences like postorbital and puerperal sepsis, ectopic pregnancy, fatal and prenatal death, cervical cancer, infertility, chronic physical pain, emotional distress and social rejection in women.

In developing countries, due to early marriage women become sexually active at a young age. These sexually active adolescents and young people became victim of reproductive tract infections (RTIs) at an early age. Therefore, burden of untreated RTIs is especially heavy for adolescent women because these infections are often asymptomatic or the symptoms are not recognizable. They are vulnerable for both physical and social reasons and often suffer serious long-term consequences. These problems arise primarily as a result of low education, early marriage, early pregnancy and unsafe sex. But adolescent groups are often neglected by program efforts and health policy. It was only after the International Conference on Population and Development (ICPD) held at Cairo in the year 1994 adolescents and their sexual health were given more priority. But still these vulnerabilities remain poorly understood and served.

There are different socio-demographic economic, sexual, medical and behavioral factors related to RTIs/STIs. Ooman (2000) documented a positive association between Pelvic Inflammatory Diseases (PID) among women and husbands' extramarital sexual relations. Use of contraception especially, IUD, female sterilization, and abortion procedures also increases the risks of RTIs (Gittlesohn et al., 1994; Bhatia and Cleland 1995; Gogate et al., 1998). Also, obstetric experiences of women and certain routine procedures during gynecological examinations may lead to contracting RTIs. Lack of menstrual and personal hygiene is also found to be associated with RTIs. In addition, there are socio-economic and cultural determinants of RTIs. Studies have shown a strong association between women's livelihood, work and their reproductive health. (Ooman, 2000).

RTIs, generally seen as a 'silent' epidemic and is one of the major public health problems causing a significant proportion of gynaecological morbidity and maternal mortality in developing countries (Dixon-Mueller & Wasserheit, 1991). Moreover, 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 about their reproductive health problems especially, due to shame and embarrassment (Bang et al .,1989; Oomman 2000). Untreated infections can not only lead to PID, ectopic pregnancy, infertility and cervical cancer but also 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 (Mamdani, 1999). As most of these illnesses progresses to a chronic state and remain with the women for the rest of their lives, the importance of early detection and management becomes much more evident.

Around 340 million incidence of STIs are curable each year with 151 million of them are from south and south-east Asia (WHO, 2005). Moreover, two third of all STIs occur among young and adolescent people who are in their early twenties (WHO, 1995). About 315 million young people aged 10–24 years are in India, representing 30 percent of the country's population (PRB, 2006). About 10 percent of the total population is adolescent girls aged 15-19 years (Barua & Kurz, 2001). This cohort is much more advanced. They are healthier, more urbanized, and better educated than earlier generations (Jejeebhoy & Bhot, 2002). At the same time, these young people face significant risks related to sexual and reproductive health, and many lack the knowledge and power they need to make informed sexual and reproductive health choices. About three-quarters of women (74 percent) aged 20-49 years

are married before reaching the age of 20 (IIPS, 2006). Until now, little is known about the prevalence of reproductive tract infections (RTIs) or sexually transmitted diseases (STIs) among adolescent women in developing countries such as India. A recent study of young married women aged 16-22 years in a rural community in Tamil Nadu reports a very high level of morbidity. The study shows that more than half of the women were suffering from at least one or more RTIs. Clinical examination also confirmed STIs among majority of them (Prasad et al 2005). Similarly, very few attempts have been made to study their health seeking behavior for reproductive morbidity (Islam et al., 1998; Barua, 2000; Prasad et al 2005; Rani & Banu, 2003). Kulkarni (2002) and Adhikari (2002) in their studies of adolescent women in India and Nepal report relatively high rates of gynecological morbidities, especially in the settings where girls have limited access to adequate health care. Moreover, a national level study using district level data is rare in Indian case. Therefore, the present study focused on knowledge and prevalence of reproductive tract infection among married adolescent women in India with a special focus on different categories of infection and treatment seeking behavior.

**Data and Methods**

The third round of District Level Household and Facility Survey (DLHS-3, 2007-08) data is used for the purpose of analysis which provides district level information about reproductive and health care of women aged 15-49. DLHS-3 is a nationwide survey under Reproductive and Child Health (RCH) programme of Government of India which covers 601 districts from 34 states and union territories of India. The third round of the district level household survey was conducted during December 2007 to December 2008 and was funded by the Union Ministry of Health and Family Welfare, United Nations Population Fund (UNFPA) and United Nations Children's Fund (UNICEF). The survey is considered as one of the largest survey in the world on reproductive and child health issues collected information from 7, 20, 320 households from 28 states and 6 Union Territories of India during 2007-08. From these households, 6, 43,944 ever-married women aged 15-49 years and 1, 66,620 unmarried women aged 15-24 years were interviewed.

Information collected about all 39, 164 ever-married women aged 15-19 was considered for the study. We considered on 15-19 as adolescents due to data limitations. DLHS-3 data provides information about 1) knowledge of mode of transmission of reproductive tract

infection 2) self reported RTI/STI symptoms 3) treatment seeking behavior of women. In the knowledge part, awareness about any RTI/STI symptoms (Yes/No) and mode of transmission were used to identify the socio-economic differentials among adolescent married women. Abnormal vaginal discharge has been focused by the survey. Further, Information about ten RTI/STI symptoms (such as itching/ boils/ulcers/warts around vulva, pain in lower abdomen, swelling in groin, painful blister, painful intercourse and spotting etc) other than any problem of vaginal discharge was recorded for a reference period of three months prior to the survey which is used to estimate the prevalence of RTI/STI among the women. Discussed with husband (Yes/No) about the symptoms, whether sought care (Yes/No) and type of health facility (Govt/Private/others) used is utilized for analyzing treatment seeking behavior of adolescent women.

Multiple statistical techniques are used for analysis. Univariate and bivariate techniques like *cross tabulation* were used to know the level of prevalence of RTIs symptoms and treatment seeking behavior among women by different socio-demographic, medical and behavioral characteristics. *Factor analysis* has been carried out to create index using all the eleven symptoms of RTI/STI. *Simple linear regression* was used to know relation between different types of infections (indices) and socio-demographic medical and behavioral characteristics. The explanatory variables are: religion, caste, educational levels, type of house, age of women, age at marriage, pregnancy wastage, parity, contraceptive users, aware of RTI/STI. Some the biomedical characteristics like abortion, place of delivery and use of modern contraceptives were also used to know socio-economic differentials. In order to estimate net effect of the each variable on the probability of seeking treatment or consultant, *binary logistic regression model* was used.

## Results

### Awareness of Reproductive Tract Infections among Adolescent Women

Table 1 shows knowledge of different mode of transmission of RTI/STI of ever married women by their age groups in India. The table reveals that only one fourth of the married adolescents are aware of RTI/STI problems as compare to one-third of women above 25 years. 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 homosexual is low among women in India and lower among adolescent women than their elder counterpart.

Less percentage of younger, illiterate and women from poorest wealth quintile are aware of RTI/STI as compared older, higher educated and women from richest wealth quintile respectively (table not shown).

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

| Knowledge of different mode of transmission of RTI/STI | 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 | 62.0 |
| Unsafe sex with sex worker | 26.4 | 28 | 28.9 | 28.6 |
| Other | 18.8 | 14.6 | 14.6 | 14.8 |

**Prevalence and Duration of RTIs/STIs among adolescent women**

Women having any reported symptoms of RTIs/STIs among women- adolescent, young and old married women represented in table 2. Around 13 percent of women 15-49 reports abnormal vaginal discharge and around 18 percent of them reports any symptoms RTIs/STIs other than abnormal discharge. Although more percent of older women reports any infection than adolescents but difference is marginal among age groups. Low backache (12.6 %), Pain in lower abdomen not related to menses (5.7%), Itching or irritation over vulva (5.4%), Pain on urination or defecation (3 %) and Boils/ulcers/warts around vulva (1.6 %) are the major problems reported by married women of all categories. The pattern is almost similar among adolescent married women with almost 8, 6 and 5 percent reporting low backache, pain in lower abdomen not related to menses and itching or irritation over vulva respectively. More adolescent reported the problem of pain during sexual intercourse (5.2 %) and spotting after sexual intercourse (1.2 %) than young and old married women.

Table 2: Percentage of ever married women reporting different symptoms of RTIs/STIs by their age groups, India, 2007-08

| RTI/STI problems during last 3 months | Age of Women (in years) | | | |
|---|---|---|---|---|
| | Adolescent 15-19 | Young 20-24 | Older 25+ | Total 15-49 |
| **Any RTI/STI Symptoms*** | **14.9** | **16.4** | **18.1** | **17.6** |
| **Abnormal Discharge** | **11.0** | **12.6** | **12.9** | **12.7** |
| Low backache | 7.9 | 10.4 | 13.4 | 12.6 |
| Pain during sexual intercourse | 5.2 | 3.9 | 3.5 | 3.9 |
| Pain in lower abdomen not related to menses | 4.8 | 5.5 | 5.8 | 5.7 |
| Itching or irritation over vulva | 4.3 | 5.2 | 5.5 | 5.4 |
| Pain on urination or defecation | 2.5 | 2.8 | 3.0 | 3.0 |
| Boils/ulcers/warts around vulva | 1.6 | 1.6 | 1.7 | 1.7 |
| Spotting after sexual intercourse | 1.2 | 0.6 | 0.3 | 0.4 |
| Swelling in the groin | 0.8 | 0.9 | 1.1 | 1.0 |
| Painful blister like lesions | 0.6 | 0.7 | 0.8 | 0.7 |

*excluding abnormal discharge

Table 3 presents adolescent married women reporting different symptoms of RTIs/STIs and duration of the illness in percentage. The result shows the most dismal figure. More than one fourth women reported that they have persisted with any reproductive infections for more than a year. The proportion varies from 20 to 32 percent for various morbidities. More than 30 percent adolescent women had problem of abnormal vaginal discharge, low backache, and swelling in groin for last one year or more.

Table 3: Percentage of adolescent married women reporting different symptoms of RTIs/STIs and duration of the illness, India, 2007-08

| Problems during last 3 months | % Women Suffering[a] | Duration Illness | | | | | Total[b] | N |
|---|---|---|---|---|---|---|---|---|
| | | > One Month | 1-3 Months | 4-6 Months | 7-12 Months | <One Year | | |
| Any RTI/STI Symptoms* | 14.9 | 8.3 | 31.0 | 14.1 | 14.4 | 26.3 | 94.2 | 9661 |
| Abnormal Discharge | 11.0 | 4.2 | 22.1 | 11.9 | 12.7 | 31.5 | 82.4 | 7127 |
| Low backache | 7.9 | 5.7 | 27.9 | 15.0 | 14.9 | 30.1 | 93.7 | 5154 |
| Pain during sexual intercourse | 5.2 | 7.9 | 30.3 | 15.2 | 17.0 | 24.2 | 94.6 | 2968 |
| Pain in LA not related to menses | 4.8 | 6.5 | 28.9 | 15.4 | 14.3 | 27.9 | 93.1 | 3153 |
| Itching or irritation over vulva | 4.3 | 9.9 | 33.8 | 14.8 | 12.7 | 23.6 | 94.8 | 2836 |
| Pain on urination or defecation | 2.5 | 7.6 | 32.6 | 14.5 | 15.6 | 24.9 | 95.3 | 1626 |
| Boils/ulcers/warts around vulva | 1.6 | 9.7 | 32.1 | 13.2 | 14.2 | 25.9 | 95.0 | 1036 |
| Spotting after sexual intercourse | 1.2 | 13.8 | 32.9 | 10.0 | 16.0 | 20.5 | 93.3 | 673 |
| Swelling in the groin | 0.8 | 4.9 | 27.4 | 15.4 | 14.4 | 30.4 | 92.6 | 504 |
| Painful blister like lesions | 0.6 | 7.2 | 32.6 | 15.6 | 12.2 | 23.9 | 91.4 | 408 |

[a]excluding abnormal discharge, [b]Total duration is not 100% because of don't know and missing cases, LA=Lower Abdomen

## Socio-economic differentials of RTIs/STIs among adolescent women

Any RTIs/STIs problems show a direct association by age and CEB of adolescents. The problem is more acute among elder adolescent and those who have 3 or more child than the younger and adolescent with no child respectively. The bivariate result also shows that higher percentages of married Muslim adolescents have abnormal discharge and any one RTIs/STIs symptom as compare to the Hindu adolescent. Abnormal vaginal discharge and any other RTIs/STIs problem are high among adolescent who are not aware of any RTIs/STIs problem than those who are aware of the problem (table not shown).

**Table 4: Any RTIs/STIs problems by biomedical factors**

| Medical Factor | Any RTI/STI Symptoms | Pearson Chi-square |
|---|---|---|
| **Modern method** | | |
| No | 14.5 | 31.738** |
| Yes | 18.9 | |
| **Female Sterilization** | | |
| No | 14.8 | 4.704* |
| Yes | 18.6 | |
| **IUD** | | |
| No | 14.8 | 0.317 |
| Yes | 16.8 | |
| **Any Abortion** | | |
| No | 14.4 | 95.116** |
| Yes | 22.6 | |
| **Spontaneous Abortion** | | |
| No | 14.4 | 91.754** |
| Yes | 22.8 | |
| **Induced Abortion** | | |
| No | 14.8 | 5.141* |
| Yes | 20.4 | |
| **Home Delivery** | | |
| No | 14.5 | 11.660** |
| Yes | 16.0 | |

Table 4 explains any RTIs/STIs problems by some of the important biomedical factors. The result shows that higher percent of adolescent using any modern method (19 %), had any abortion (23 %) and home delivery (16 %) have reported any RTIs/STIs problems as compared to adolescent those who are not using any modern method (15 %), had no abortion (15 %) and home delivery (14 %) respectively. The chi-square value is significant in all the cases. Both in case of spontaneous and induced abortion the reporting of RTIs are higher among married adolescents.

**Factor Analysis and determinants of RTIs/STIs among married adolescents women in India**

Principal component factor analysis using all eleven symptoms of RTIs/STIs reported was assessed using varimax with kaiser normalization rotated method (correlation score > 0.4). The result reveals three distinct factors a) Infections in the lower tract i.e. around the vagina which includes boils/ulcers/warts around vulva, painful blister like lesions in and around the vagina, itching or irritation over vulva and swelling in groin b) other reproductive infection related to upper tract of the organs like abnormal vaginal discharge, pain in lower abdomen not related to menses, pain during urination and defecation and low backache c) intercourse related problem of pain and spotting.

We used linear regression to understand different socio-economic and demographic factors affecting these three variables which are in continuous form. Dummy variables are created from categorical socio-economic variables and age is used as a continuous variables. The output of the linear regression shows that women 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 have significant and positive association with lower tract infections. Other infections related to upper tract shows positive and significant association with age ($\beta$=0.04), education, region, use of modern contraception, abortion, wealth index and regions. The $\beta$ 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 lower tract. The $\beta$ value of scheduled tribes and other backward classes are -0.12 and -0.06 respectively.

Table 5: Linear regression showing beta values Lower tract infection, upper tract infection and discharge related rti/sti problems among women 15-19 years.

| Background | Lower Tract Infection (β) | 95% C.I. | Upper Tract Infection (β) | 95% C.I. |
|---|---|---|---|---|
| Age | -0.05 | -0.13, 0.03 | 0.04** | 0.01, 0.07 |
| Residence | 0.01 | -0.28, 0.30 | 0.06 | -0.05, 0.17 |
| No education | 0.08 | -0.24, 0.40 | 0.13** | 0.01, 0.25 |
| Primary | 0.01 | -0.19, 0.21 | 0.13** | 0.06, 0.21 |
| Secondary | 0.00 | -0.09, 0.10 | 0.05** | 0.02, 0.09 |
| Hindu | 0.32 | -0.10, 0.74 | 0.19** | 0.02, 0.35 |
| Muslim | 0.17 | -0.07, 0.41 | 0.24** | 0.14, 0.33 |
| Scheduled castes | -0.01 | -0.30, 0.28 | -0.04 | -0.16, 0.07 |
| Scheduled tribes | -0.10 | -0.26, 0.07 | -0.12** | -0.18, -0.05 |
| Other backward Class | -0.01 | -0.10, 0.07 | -0.06** | -0.09, -0.02 |
| Modern method of contraception | 0.36** | 0.01, 0.72 | 0.18** | 0.04, 0.31 |
| Abortion | 0.40** | 0.02, 0.79 | 0.67** | 0.52, 0.82 |
| Poorest | 0.60** | 0.19, 1.02 | 0.24** | 0.08, 0.40 |
| Poorer | 0.18 | -0.01, 0.38 | 0.14** | 0.06, 0.21 |
| Middle | 0.19** | 0.06, 0.31 | 0.09** | 0.04, 0.14 |
| Richer | 0.09 | 0.00, 0.18 | 0.07** | 0.03, 0.10 |
| North | 0.08 | -0.27, 0.43 | 0.30** | 0.16, 0.44 |
| North-east | 0.51** | 0.29, 0.72 | 0.23** | 0.14, 0.31 |
| East | 0.10 | 0.00, 0.21 | 0.12** | 0.08, 0.16 |
| West | 0.25** | 0.16, 0.34 | 0.03 | -0.01, 0.07 |
| Central | 0.13** | 0.07, 0.19 | 0.09** | 0.07, 0.12 |
| R square | 0.002 | | 0.009 | |

Note: Higher secondary and above, other religion, other caste, richest and south are considered as reference categories. Category intercourse related problems is not shown due to less no significant variables. Age is taken as a continuous variable.

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

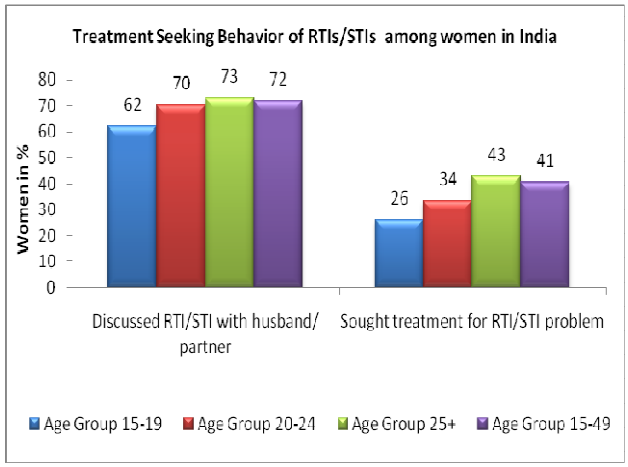


Figure 1 depicts the discussion with husband/partner and treatment seeking behavior of women by different age groups. Results shows that about three-fourths of women discuss the problem with their husband/partner but only two-fifths of them sought treatment for the problem of reproductive tract infections. Only 62 percent of the adolescent women discuss it with their husband and 26 percent of them sought treatment for the problem in contract to 73 and 43 percent of women aged above 25.

Socio-economic and demographic differential in treatment seeking behavior among married adolescent in India is presented in table 6. The outcome shows the percent of women discussing RTIs/STIs with husband/partner and seeking treatment is low among young, Hindu, rural, illiterate and poorest adolescent women as compared to the older, Muslims and other religious women, urban, higher educated and richest women respectively. Two-thirds of the elder adolescent (age 19 years) talked about the problem with husband and about one-third of them sought care. However, less than half of the women aged 15 years (young adolescent) discussed the problem of with their husband and only one-sixth of them sought care. The proportion of women educated for more than five years (65 percent) and belonging to richest wealth quintile (71 percent) discussed the problem of RTIs with their husband are higher as compared illiterate (58 percent) and women belonging to poorest categories (56 percent). More than one-third of the women belonging to richest category sought care as compared to only one-fifth of the women from poorest categories. The women from eastern region of India communicate less to husband and lowest proportion of them seeks care for RTIs/STIs as judged against other four regions. Although the communication to husband is lowest, the care seeking remains on lofty in south which is designated as demographically brighter region in India. Overall, priority is given to private hospitals and clinics for treatment than the government health centers. More than three out of five women prefer private hospitals and clinics as weigh against three out of ten women going to public hospitals for treatment. The inclination towards private health centers are high among urban, both Hindu and Muslims, higher educated (education over 10 years), rich women. However,

preference is given to private health centers irrespective of socio-economic and demographic characteristics besides women belonging to scheduled tribes and north-east region women. Incidentally, the proportion of tribes is high in the north-east region.

In order to understand the adjusted effect of different socio-economic and demographic determinants a binary logistic regression was performed taking care sought (No/Yes) as outcome variable. The results are shown in table 7. The result proves that adolescent age, education, religion, caste, wealth index categories and awareness about RTIs/STIs are significant determinants of her care seeking behavior. 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 sought treatment than the younger adolescent (age 15 years). Muslims (OR=1.45, $p<0.05$) and other (OR=1.29, $p<0.1$) religious adolescents women are more likelihood to seek treatment than the Hindu adolescents. Husband education also shows significant association and women of higher educated husband (OR=1.18, $p<0.1$) have a higher odds of seeking care than women of illiterate husband. The adolescent women having secondary education (OR=1.28, $p<0.05$), women belonging to richest quintile of the households (OR=1.39, $p<0.05$) have higher chance of seeking treatment than the women with no education and women belonging to poorest households. In comparison to adolescent from 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 6: Percentage of women age 15-19 years who has discussed about RTI/STI problems with husband and sought treatment according to selected background characteristics, India, 2007-08

| Background characteristics | Discussed RTI/STI with husband/ partner | Sought treatment for RTI/STI problem | Source of treatment | | | Number of women* |
|---|---|---|---|---|---|---|
| | | | Government | Private | Others | |
| **Age** | | | | | | |
| 15 | 46.3 | 15.9 | 39.4 | 52.0 | 8.7 | 352 |
| 16 | 55.0 | 21.5 | 21.2 | 65.4 | 13.4 | 713 |
| 17 | 59.8 | 24.0 | 22.6 | 64.0 | 13.5 | 1155 |
| 18 | 63.1 | 25.6 | 29.6 | 59.5 | 10.9 | 2794 |
| 19 | 66.0 | 30.0 | 29.2 | 60.0 | 10.8 | 2781 |
| **Religion** | | | | | | |
| Hindu | 60.6 | 24.7 | 28.1 | 61.0 | 10.9 | 2622 |
| Muslim | 67.6 | 32.9 | 25.3 | 61.5 | 13.2 | 655 |
| Other | 72.0 | 28.6 | 39.7 | 49.6 | 10.6 | 2266 |
| **Caste** | | | | | | |
| Scheduled Castes | 63.1 | 25.5 | 26.9 | 58.4 | 14.7 | 1630 |
| Scheduled Tribes | 61.7 | 20.9 | 54.0 | 38.3 | 7.7 | 622 |
| Other Backward Classes | 60.1 | 25.3 | 22.6 | 65.3 | 12.1 | 1701 |
| Others | 66.7 | 32.8 | 27.5 | 64.0 | 8.5 | 2078 |
| **Residence** | | | | | | |
| Rural | 61.4 | 25.0 | 28.5 | 59.8 | 11.8 | 1877 |
| Urban | 66.2 | 32.1 | 26.8 | 63.7 | 9.6 | 1542 |
| **Education** | | | | | | |
| No Education | 57.9 | 21.4 | 25.3 | 60.8 | 13.9 | 597 |
| Less than 5 | 62.0 | 25.3 | 30.8 | 54.9 | 14.2 | 1695 |
| 5-9 years | 65.4 | 29.0 | 30.3 | 59.1 | 10.6 | 1080 |
| 10 or more year | 65.1 | 32.0 | 25.3 | 68.3 | 6.4 | 3592 |
| **Husband's education** | | | | | | |
| No Education | 54.9 | 21.6 | 26.4 | 59.6 | 14.0 | 1428 |
| Less than 5 | 66.4 | 28.6 | 27.2 | 55.6 | 17.2 | 2977 |
| 5-9 years | 64.7 | 25.7 | 30.5 | 57.6 | 11.9 | 795 |
| 10 or more year | 62.9 | 29.9 | 26.2 | 66.7 | 7.0 | 3149 |
| **Children ever born** | | | | | | |
| 0 | 60.5 | 25.7 | 30.0 | 60.2 | 9.8 | 874 |
| 1 | 63.9 | 26.6 | 27.6 | 60.0 | 12.4 | 1748 |
| 2 | 67.4 | 27.9 | 19.4 | 63.3 | 17.2 | 703 |
| 3+ | 64.6 | 26.6 | 19.1 | 69.3 | 11.6 | 3282 |
| **Wealth index** | | | | | | |
| Poorest | 55.9 | 19.8 | 28.8 | 58.8 | 12.3 | 2062 |
| Second | 60.8 | 23.5 | 28.9 | 55.8 | 15.2 | 4570 |
| Middle | 61.7 | 27.8 | 32.6 | 55.7 | 11.7 | 2426 |
| Fourth | 66.7 | 29.6 | 27.9 | 64.1 | 8.0 | 686 |
| Richest | 70.9 | 35.7 | 17.3 | 74.2 | 8.5 | 113 |
| **Region** | | | | | | |
| North | 63.1 | 27.1 | 28.6 | 61.0 | 10.5 | 6236 |
| North-east | 74.7 | 27.2 | 52.5 | 35.2 | 12.4 | 1220 |
| East | 59.0 | 23.4 | 13.3 | 64.7 | 22.0 | 339 |
| West | 64.8 | 25.4 | 35.7 | 61.2 | 3.0 | 7218 |
| South | 50.8 | 32.8 | 27.3 | 67.4 | 5.3 | 577 |
| **Aware of RTI/STI** | | | | | | |
| Yes | 64.7 | 31.7 | 24.4 | 65.0 | 10.6 | 2320 |
| No | 61.2 | 23.8 | 30.2 | 58.1 | 11.7 | 5475 |
| **India** | **62.2** | **26.2** | **28.1** | **60.6** | **11.3** | |

* Number of Women with any RTI/STI symptoms

Table 7: Logistic regression showing odds ratio for any symptom of RTI/STI among 15-19 years women and their treatment seeking behavior in India.

| Background Characteristics | Sought Treatment Exp(β) | Number of Women with any RTI/STI symptoms |
|---|---|---|
| **Age** | | |
| 15® | | 352 |
| 16 | 1.46* | 713 |
| 17 | 1.56** | 1155 |
| 18 | 1.65** | 2794 |
| 19 | 1.97** | 2781 |
| **Religion** | | |
| Hindu® | | 2622 |
| Muslim | 1.45** | 655 |
| Other | 1.29* | 2266 |
| **Caste** | | |
| Scheduled castes® | | 1630 |
| Scheduled tribes | 0.82* | 622 |
| Other backward class | 0.90 | 1701 |
| Others | 1.17* | 2078 |
| **Residence** | | |
| Rural® | | 1877 |
| Urban | 1.13* | 1542 |
| **Education** | | |
| No Education® | | 597 |
| Less than 5 | 1.16 | 1695 |
| 5-9 years | 1.28** | 1080 |
| 10 or more year | 1.17 | 3592 |
| **Husband's education** | | |
| No Education® | | 1428 |
| Less than 5 | 1.33** | 2977 |
| 5-9 years | 1.07 | 795 |
| 10 or more year | 1.18* | 3149 |
| **Children ever born** | | |
| 0® | | 874 |
| 1 | 0.99 | 1748 |
| 2 | 1.12 | 703 |
| 3+ | 1.04 | 3282 |
| **Wealth index** | | |
| Poorest® | | 2062 |
| Second | 1.13 | 4570 |
| Middle | 1.26** | 2426 |
| Fourth | 1.22* | 686 |
| Richest | 1.39** | 113 |
| **Region** | | |
| North® | | 6236 |
| North-east | 0.84* | 1220 |
| East | 0.92 | 339 |
| West | 1.02 | 7218 |
| South | 1.25** | 577 |
| **Aware of RTI/STI** | | |
| Yes® | | 2320 |
| No | 0.72** | 5475 |
| **-2 Loglikilihood** | **14472.61** | |

## Discussion

Reproductive Tract Infections commonly affects the quality of women's lives in the developing countries where it is hyper endemic. Adolescent women are always in high risk to infections because of lack of awareness, early marriage which lengthens their reproductive span and social taboos prevailing in societies. Most of the studies on RTIs bring out a very high prevalence of reproductive morbidities in developing countries specifically in South Asia (Gulati et al, 2009; Chellan, 2007; Reshmi & Unisa, 2006, Rahman & Shahidullah, 2005; Prasad et al, 2005; Bhatia & Cleland, 1995; Bang & Bang, 1989). However, there are few studies which focus on reproductive health of adolescents (Barua & Kruz, 2001; Rahman & Shahidullah, 2005; Prasad et al, 2005). So the present study highlighted prevalence and treatment seeking behaviour of married adolescents in India using the national level large scale data from third round of DLHS.

We found that awareness of RTIs/STIs among married are very low in India (Mohapatra & Mohanty, 2008; Meitei, 2005) even compared to their African countries (Raibu et al, 2010; Wools et al, 1998). Only one-third of the women of reproductive age 15-49 years are aware about any mode of transmission considered in the study. Moreover, the awareness among adolescents women are even lower (Mohapatra & Mohanty, 2008) with only one-fourth of them reporting awareness about any mode of transmission of infections in reproductive tracts. Unsafe sex with persons having many partners (60%) is considered by many as the mode of transmission whereas very low percentage of women knows unsafe delivery, unsafe abortion, unsafe IUD insertion and unsafe sex with homosexual could lead to reproductive infections. A study in rural Bangladesh however reported that only 12% of the study population had basic understanding of RTI's. The study by Raibu et al (2010) 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. But the current study found out only 31 percent of the urban adolescent women in India are aware of any RTIs/STIs symptoms.

Among the adolescent women, around 15 percent reported to have any symptoms of RTIs/STIs and 11 percent reported about abnormal vaginal discharge in the last three month of the survey. The prevalence of any RTI is around 18 percent among women aged 25-49 years. The earlier studies on South Asia found the prevalence of reproductive varies in

between 22% to 92% (Gulati et al, 2009; Rahman & Shahidullah, 2005; Kambo *et al.,* 2003; Bhatia & Cleland, 1995; Wasscrheit *et al.,* 1989; Bang *et al.,* 1989). However, most of these studies included all three types of reproductive morbidities including gynecological morbidities. The study found that low backache (8 %), pain in lower abdomen not related to menses (4.8 %), Itching or irritation over vulva (4.3 %) are the major problems reported by married adolescents. The results are very much in the similar direction with a Bangladeshi study on adolescent (Rahman & Shahidullah, 2005) however, the percent remains in the lower side. The duration of the illness is found to be very high with more than one-fourth of the adolescents reporting infections for more than a year by most of the diseases. The finding about duration of these infections goes in the same line of Bhatia and Cleland (1995) study which also shows most women kept their illness/disorder for more than one year. This shows the reluctance of women for clinical examination which may lead to severe impact on her health, fertility and productivity.

The combined effect of biomedical, behavioral, and societal factors is remarkable high on the incidence reproductive tract infections in developing countries (Wasserheit, 1989). India's population being highly diverse these factors have a greater importance than other countries. The bivariate result in this study shows, higher percentages of married Muslim adolescents have abnormal discharge and any one RTIs/STIs symptom as compare to the Hindu adolescent. Higher percent of adolescent using any modern method, had any abortion and home delivery reported any RTIs/STIs problems as compared to adolescent those who are not using any modern method, had no abortion and home delivery. The linear regression analysis also shows significant and positive relationship with use of modern contraception with both the indices – lower tract infections and other infection related to upper tract (Gulati et al, 2009). Improper use of modern contraception can be one of the major cause of RTIs among those using modern contraception. A few studies indicate that a large number of abortions in India are performed by unqualified medical practitioners (Bhatia and Ramaiah, 1971; Bhatia, 1973). Such abortions not only result in a great number of maternal deaths but also may cause severe long-term disabilities, including PID, among surviving women.

In India, although premarital sexual relationship is not as prevalent as other countries, but an early induction into marriage compel women for an early and long sexual life with husband. By and large, at this age they are not accustomed to use of family planning and other sexual health education. Moreover, due to social taboos they don't report most of them don't report due to shame and embracement. Only 41 percent of women aged 15-49 sought treatment very

much nearer to finding (33%) of Gulati et al. (2009). The present study found the treatment seeking is very low among adolescent women in India. Only 62 percent of the adolescent women discuss about the infections with their husbands/partner whereas only one out of four from them goes for treatment. The discussion and treatment seeking is much higher among older women (25+ years) as compared to the adolescents. This may be possible as an older woman enjoys a better status in households than a younger newly married woman. 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. Even more than half the poorest and poorer section of the quintile prefers to private hospitals or clinics. This shows going to private hospitals is a compulsion than choice. Multivariate analysis results shows that age, education, economic status (wealth index), awareness about the infection are crucial determinants of treatment seeking.

**Conclusion**

The result of this study shows that even though awareness of life taking reproductive infections still remains poor despite of several government efforts through Reproductive and Child health (RCH) programme and the current national rural health mission (NRHM). The awareness remains pathetic among adolescent women who have very low awareness about the infections. Many of the women ignore these types of infections and keep taping treatment may be due to lack of knowledge and social taboos. Access to services also cannot be ignored. Lack of knowledge about different methods of modern contraception and improper use is still in quest. Moreover, female sterilization has still dominated utilisation family planning. The question raised by Bhatia and Cleland (1995) through their research paper still remains unsolved. The treatment seeking still remains at the lower half and it pathetic among the adolescent as it comes out from the study. The number of unqualified and illegal private medical practitioners practicing allopathic medicine and doing abortions has remained 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 (Bhatia et al., 1975). Women rarely use the government health centers than private ones. Going to private hospitals for treatment remains a compulsion than choice. This underutilization has been described in many other studies (Johns Hopkins University, 1976; Chuttani et al., 1976; Kanitikar and Sinha, 1989) in the 80's and 90's remains fluid. So most

important is bringing out the real capability of government health centers keeping an eye on private practitioner.

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