Abstract

Background: About 23% of India’s population is in the adolescent age group of 10–19 years. 25% of patients attending government STI clinics are younger than 18 years. Over 50% of all new HIV cases in India are among 10–24 years. Many adolescent boys and girls are sexually active but lack information and skills for self-protection. That is why we need to focus on adolescents.

Objectives: To assess the knowledge of adolescent boys regarding development of secondary sexual characters, sequence of development secondary sexual characters, sexually transmitted diseases and methods of population control.

Methodology: The 15–19 year-old study subjects were selected from Sunder Nagri (an urban slum). 384 samples were selected from the study population. Systematic random sampling method was used. Data was collected by a self-administered questionnaire. Data was analyzed using frequency, percentages, and inferential statistics. Association between knowledge and demographic variables was found out using Chi-Square test.

Results: Majority of the participants had either no knowledge (36%) or partial knowledge (45%) regarding the development of sexual characters and only 4% had excellent knowledge and 15% had good knowledge: No knowledge (51%) about the sequence of development of secondary sexual characters. Only 1% was able to tell about testicular increment in size and pubic hair. Majority of them had partial knowledge regarding names, modes of transmission and prevention of STDs/AIDS; partial knowledge (85%) regarding the methods of population control. There was significant association between knowledge and literacy status of participant, age, and literacy status of father. There was no significant association between knowledge and socio-economic status and religion.

Keywords: Knowledge, Secondary sexual characters, Adolescents

Introduction

The period of adolescence is one of the rapid growth, change, relocation and self-discovery, which are defining qualities of stressful experience.1 To view the lives of adolescents through the lens of health care is to see a paradox: while most adolescents at this stage of life are thriving, they are also experiencing their moment of greatest vulnerability in terms of susceptibility to impulsive and risky behaviors involving sex, violence, substance use and driving. It is during adolescence that lifelong behaviors are set in such areas as diet and exercise; sexual conduct; practices related to oral health, smoking, drinking, and the use of legal and illegal substances; and peer interactions that can
enhance or discourage injuries. In theory, most prevailing models of developmental psychopathology recognize the potential importance of psychosocial stress in etiology and maintenance of disorders in youth. Health care system is focused on addressing problems that derive predominantly from biological causes. Health concerns of adolescents generally involve behavioral practices. The most difficult issues many adolescents confront in their daily lives are questions about sexuality and experimentation with drugs and alcohol, dealing with emotional problems, concern about physical appearance, etc. These could easily turn into health problems that can persist throughout their adult lives.

Adolescence covers ages 10–19 years in the RCH-II program. Government of India (GOI) in the National Youth Policy defines adolescence as 13-19 years. The stage of life during which individuals reach sexual maturity is known as adolescence. It is the period of transition from childhood to adulthood. Although the change is biological, the duration and nature of adolescence are primarily a social construct and thus vary greatly from culture to culture. World Health Organization (WHO) identifies the age range 10–19 years as the period of adolescence, while the term “youth” denotes the age group 15–24. Young adolescents constitute an equally large amount of those infected with sexually transmitted diseases (STDs). Although pre-marital sex among unmarried people is condemned, the gap between expected and actual behavior is enormous.

Despite the commonality of STDs, they are one of the most under-recognized health problems worldwide. Many people with STDs are asymptomatic and remain undiagnosed. In addition, those who are diagnosed are frequently not reported and counted. Furthermore, most of the published data on the prevalence and incidence of STDs come from developed countries.

We need to focus on adolescents because:

Adolescents (10–19 years) form a large section of population – about 22.0%, that is, about 225 million. They are living in diverse circumstances and have diverse health needs. The total population of young people (10–24 years) is approximately 331 million comprising nearly 30% of the total population of India (Census 2001).

Youth are vulnerable to sexually transmitted infections, including human immunodeficiency virus, and account for 31% of AIDS burden in the country. Though age at marriage is increasing, data from NFHS-3 (National Family Health Survey 3) shows that 27% of young women and 3% of young men in the age group of 15–19 years were married at the time of the survey (2005-06). Largest proportion of estimated 3 million drug abusers and 0.6 million drug dependents in India is in the age group 16–35 (Source: UNODC and Ministry of Social Justice and Empowerment, 2004). Only 65% of women and 84% of men have heard or seen a family planning message on TV, radio, wall paintings, or in newspapers/magazines (NFHS 3). Only 20% of women and 36% of men have comprehensive knowledge about HIV/AIDS, i.e., they have correct knowledge of all the ways of transmission and prevention of the infection (NFHS 3).

Unmet need for contraception among late adolescents (15–19 years) is 13.2%.

Contraceptive use in both the genders is very less. As per NFHS-3 findings, only 14.1% (14.7% urban versus 13.9% rural) of unmarried sexually active adolescent females used a contraceptive. Premarital sexual relations are increasing. Trafficking and prostitution has also increased in the recent past. Misconceptions about HIV/AIDS are wide spread.

Adolescence is a period of rapid physical growth along with sexual and psycho-social changes. Habits and behavior picked up during adolescence (risk-taking behavior, substance abuse, eating habits, and conflict resolution) have lifelong impact.

Complementary actions are needed to promote healthy development in adolescents; to prevent health problems or problem behaviors; and to respond to them if and when they arise. They need interventions to decrease and to mitigate their vulnerability. These include: information and skills; a safe and supportive environment; and appropriate and accessible health and counselling services. Adolescence is the last chance to correct growth lag and malnutrition.

Many adolescent boys and girls are sexually active but lack information and skills for self-protection (low level of information on family planning, low contraception use). They have simple, but widely prevailing and crucial reproductive health needs – contraception; (including emergency contraception), safety from STI/HIV.

25% of patients attending Government STI clinics are younger than 18 years. There is an increasing trend in the vulnerability of adolescent to HIV/AIDS. Over 50% of all new HIV cases in India are among 10–24 years (UNAIDS-2002). According to a study among university students in India, South Africa and United states, only 57.9% admitted using condom while indulging in sex last time. Even though condom awareness among youth is as high as 83.8% on an all-India level, actual condom usage is reported to be less. A study showed that only four in ten students from Delhi University reported occasional condom use during sexual intercourse.

More alarming is the reported condom use rate of 7% by sexually active youth in a town in Assam state. A study
done in Bangladesh showed that by age 19, approximately 88% of urban adolescent males reported premarital sexual intercourse whereas it was 44% among rural counterparts. The adolescent poses a distinct array of reproductive and sexual health challenges. These challenges include the consequences of early marriage, unsafe abortions, high-risk behavior, lack of awareness about safe sex and reproductive health issues and sexually transmitted infections (STDs) including HIV/AIDS and non-consensual sex. This creates an “unmet need” for reproductive and sexual healthcare.

This unmet need varies among married and unmarried adolescents.

Unmarried adolescents hesitate to seek health services due to non-confidentiality, inability to pay, requirement of parent’s approval and negative or insensitive attitude of health providers. A study among college-going adolescent boys in Delhi has reported that three out of eight male students who opted for testing were found to be strongly positive for mixed STD infections.

The aim of the study was to assess the knowledge of adolescent boys regarding development of secondary sexual characters and also to assess the knowledge of adolescent boys regarding development of secondary sexual characters, their knowledge regarding sequence of development secondary sexual characters, to assess their knowledge regarding sexually transmitted diseases and to assess their knowledge regarding methods of population control.

**Materials and Methods**

A survey approach was adopted in this study to assess the knowledge among adolescents through self-administered questionnaire. Study design adopted for this study was cross-sectional. The variables in the study were demographic characteristics (independent variables) and level of knowledge (dependent variable).

**Table 1. Variables under Study**

| Dependent Variable | Knowledge |
|--------------------|-----------|
| Age of participants |           |
| Literacy status of participants |           |
| Literacy status of father |           |
| Socio-economic status |           |
| Religion |           |

**Settings of the Study**

The study was conducted at Sunder Nagri, a slum and resettlement colony of East Delhi. It is a thickly populated area. The total population as on 10-06-2011 was 65,534. Majority of them belonged to low socio-economic status. The adolescents form 11.8% of the total population. The 15–19 years old study subjects in this population form 5.5% (3601). The population is provided health services from Community Health Dept. of St. Stephens Hospital and Govt. Dispensary. There is a tertiary hospital (GTB) within a short distance also.

**Sample Size Calculation**

Formula used for sample size calculation is Cochran’s formula:

\[ Z^2 \times \frac{p(1-p)}{m^2} \]

where \( Z \) is the standard normal deviate and \( p \) is the estimated proportion.

\[ Z^2: 1.96 \] (rounded off to 2) is the abscissa of the normal curve that cuts off an area at the tails.
P: Prevalence of the knowledge (from previous similar community based studies); taking the prevalence to be 60% in the calculation.\textsuperscript{35-37, 39}

e: Level of precision; taken 5%.

Sample Size = \( \frac{4 \times 60 \times 40}{5 \times 5} = 384 \)

Samples and Sampling Technique

A sample is a small proportion of a population for observation and analysis.\textsuperscript{54} Updated computerized information is available on the population of Sunder Nagri at the Dept. of Community Health. From this population, the numbers of adolescents (15–19 years) were enumerated and then systematic random sampling technique was followed. The first sample number selected randomly was 50 and then every 9\textsuperscript{th} subject was selected; thereafter, till the desired number 384 was reached. These adolescents became the subject of the study.

Inclusion Criteria

All subjects of the age group 15–19 years (selected by systematic random sampling) who gave consent and whose parents gave permission.

Exclusion Criteria

Those who were not willing to participate in the study; who did not give consent; or whose parents did not give permission, In case a participant refused consent or parents showed unwillingness, the next adolescent was approached.

The data was collected by a self-administered questionnaire with the tools of demographic preformat and a semi-structured questionnaire for knowledge assessment after getting the content validated and approved. Demographic proforma consisted of 16 items. All the items were approved. The semi-structured questionnaire consisted of 34 Items. All the items were approved.

A pilot study is a small preliminary investigation as the same general character as the major study. A preliminary run of the main study was conducted from 16.06.2011 to 16.07.2011 in a population with similar characteristics. The tool was administered to 40 participants. Proper explanation about the study was given to the participants. The tool was found to be comprehensible, feasible and acceptable. Based on the pilot study, the questionnaire was modified wherever needed.

Data collection was scheduled from July 2011 to Dec 2012. Before the collection of data, the investigator obtained formal permission for conducting the study from the head of the institution and also approval from ethical committee of the Institute. Investigator visited the houses of adolescents who were selected as participants and collected information on the proforma in the time period provided for the study. After the completion of questionnaire, any doubts raised by the participants were clarified. The data collected was analyzed using frequency, percentages and inferential statistics.

The demographic distribution reveals that the maximum number is contributed by 15 year olds (29%) followed by 16, 17 and 18 years olds respectively (27%, 24% and 20%).
Knowledge of Participants regarding Secondary Sexual Characters

Level of knowledge of participants was obtained by administering a semi-structured questionnaire and then dividing it into different grades according to the number of correct answers related to development of secondary sexual characters given by the participants.

Table 2. Description of the Level of Knowledge of Participants

| Level of Knowledge       | Number | %    |
|--------------------------|--------|------|
| Excellent knowledge      | 15     | 4    |
| Good knowledge           | 57     | 15   |
| Partial knowledge        | 172    | 45   |
| No knowledge             | 140    | 36   |
| Total                    | 384    | 100  |

Knowledge of Participants regarding the Sequence of Development

Table 3. Description of Knowledge of Participants regarding the Sequence of Development of Secondary Sexual Characters

| Knowledge regarding Sequence                                      | Percentage |
|-------------------------------------------------------------------|------------|
| Testicular increment in size and pubic hair                       | <1         |
| Axillary, facial and body hair                                    | 23         |
| Increment in height and deepening of voice                       | 25         |
| No knowledge                                                      | 51         |

Knowledge regarding Sexually Transmitted Diseases

Knowledge regarding the Names and Prevention from STDs

Table 4. Description of Knowledge regarding the Names of STDs

| Level of Knowledge | Number | % of Participants |
|--------------------|--------|-------------------|
| Good               | 0      | 0                 |
| Partial            | 330    | 86                |
| No                 | 54     | 14                |
| Total              | 384    | 100               |

Table 5. Description of Knowledge regarding Prevention from STDs

| Level of Knowledge | No. | % of Participants |
|--------------------|-----|-------------------|
| Good               | 12  | 3                 |
| Partial            | 234 | 61                |
| No                 | 138 | 36                |
| Total              | 384 | 100               |

Knowledge regarding the Mode of Transmission/Prevention of AIDS

Table 6. Description of Knowledge of Participants regarding the Mode of Transmission and Prevention of AIDS

| Level of Knowledge | Number | %    |
|--------------------|--------|------|
| Good knowledge     | 31     | 8    |
| Partial knowledge  | 261    | 68   |
| No knowledge       | 92     | 24   |
| Total              | 384    | 100  |
Knowledge regarding Methods of Population Control

Table 7. Description of Level of Knowledge of Participants regarding the Methods of Population Control

| Level of Knowledge    | Number | % |
|-----------------------|--------|---|
| Good knowledge        | 22     | 6 |
| Partial knowledge     | 328    | 85|
| No knowledge          | 34     | 9 |
| Total                 | 384    | 100|

Data represented in Table 7 shows that there was a significant association found between knowledge and literacy status (P=<0.0000001), knowledge and age (P=0.000000298), knowledge and literacy status of father (P=<0.0000001).

There was no significant association found between knowledge & socio-economic status and religion.

**Discussion**

**Section I: Description of Sample Characteristics**

The total study sample was 384 adolescents. The study subjects were selected in the age group of 15–19 years. 29% of the participants were in the age of 15 years; 27% were in the age of 16 years; 24% were in the age of 17 years and 20% were in the age of 18 years.

The total number of adolescents of age group 15–19 years in Sunder Nagri (sampling frame) was 3601, which is around 5.5% of total population and the proportion of adolescents in this population is lower than the percentage of adolescents of this age group in India which is around 9.4% of the total population (Census 2001).

The world is home to 1.2 billion individuals aged 10–19 years, forming 18% of world population.

There are 225 million adolescents comprising nearly 1/5th (22%) of India’s population. Of the total population, 12% belong to the 10–14 years age group and nearly 10% are in the 15–19 years age group. Females comprise almost 47% and males 53% of the total adolescent population.

**The Literacy Status**

Majority of the participants were in Middle School and
High School, covering 68% of the participants. Only 13% had studied beyond high school, 10% had studied up to Primary; whereas 9% were illiterate.

Literacy status of father shows that majority of them were illiterate 46%. Only 5% had studied beyond high school, 24% up to Primary, and 9% up to Middle School level whereas 16% had studied up to High School.

In our study the percentage of illiterates in the age group of 15–19 years came to 9% whereas the percentage of illiterates for Delhi of the same age group comes to around 5% for males (DLHS 3).

In the study, percentage of illiterates comes to be 46% which is too low than the National and Delhi’s rate, i.e., 25% and 18.3% respectively. This by itself clearly depicts the poor status of persons living in slums even in the city like Delhi. This lower literacy status is responsible for poor level of knowledge regarding so many issues that had been planned to be addressed in this study.

**Distribution by Religion**

In the sample population, out of 384 there were two main religious groups, Hindus and Muslims. There was almost equal representation of both religions in the study sample.

**Socio-economic Status**

The socio-economic status was typical of a slum area of Delhi with majority of participants belonging to lower socio-economic group. This is because of poor literacy status of parents and lower income group of the population.

**Section II: Description of Knowledge of Participants**

**Prevalence of Knowledge of Development of Secondary Sexual Characters in the Adolescent Boys**

A person’s knowledge and attitude have a strong influence on his or her sexual attitudes and behaviors. Apparently, adolescents both boys and girls have very little knowledge about reproductive anatomy, physiology, sex and contraception. Girls have almost no information and boys are misinformed.

Overall level of knowledge of participants in the current study is 64% out of which majority (45%) had partial knowledge, 15% good knowledge but only 4% of participants had excellent knowledge regarding the secondary sexual characters.

Level of knowledge is determined by many factors and here in this study four major independent variables affecting knowledge regarding the secondary sexual characters are age of the participants, literacy status of participants, their father’s literacy status, and the socio-economic profile of the participants.

The study in urban slum of Delhi clearly shows that the slum adolescents profoundly lack appropriate and adequate knowledge of sexuality related matters. More than 50% of adolescents were aware of moustache and beard as common signs of secondary sexual characters for boys. Knowledge of males regarding nightfall and pubic hair (male) is 16.8% and 12.9% respectively.

In a study conducted on school-age adolescent males from two different socioeconomic settings: peri-urban and rural areas of the State of West Bengal, India, a large portion of the boys reported the appearance of pubic hair (PU 100.0% and R 96.42%), axillary hair (PU 98.18% and R 83.92%), facial hair (PU 96.36% and R 71.42%), body hair (PU 85.45% and R 46.42%), change of voice (PU 94.54% and R 98.21%) and change in the size of the penis (PU 98.18% and R 92.85%) as the major secondary sexual characteristics that develop among males at the time of adolescence. The adolescent males of both groups reported development of breasts (PU 100% and R 87.45%), axillary and pubic hairs (PU 96.36% and R 48.21%) and attainment of menarche (PU 67.27% and R 30.35%) as the major secondary sexual characteristics that develop in females at the time of adolescence. However, it appears that in general, the peri-urban boys are more aware about the development of secondary sexual characteristics than their rural counterparts.

Majority of respondents (86.4%) did not have correct knowledge regarding sex and 70% did not have correct knowledge regarding contraceptives in a study conducted to identify the sexual knowledge, attitude and behavior of the school and college students aged between 15 and 24 years living in slums of Delhi and Lucknow.

These studies and the study mentioned here clearly shows that adolescent lack knowledge about secondary sexual characteristics and this had to be addressed seriously.

**Prevalence of Knowledge of Sequence of Development of Secondary Sexual Characters**

In the study, the assessment of knowledge about the sequence was a little troublesome because none of the participants knew about the exact sequence of development of secondary sexual characters.

So to assess the sequence, few similar questions were clubbed and then knowledge was assessed.

Regarding the testicular increase in size and genital hair, 3% of the participants could tell the sequence; 22% had knowledge about the sequence of development of axillary, facial and body hair; 24% had knowledge about the sequence...
of height increase and deepening of voice; and 51% had no knowledge about the sequence of development of secondary sexual characters.

The pubertal sequence of events follows a certain pattern (accelerated growth, breast development, adrenarche, menarche) on average requiring a period of 4.5 years. In fact, most information available about the timing of puberty is for girls, as breast development and onset of menstruation (menarche) are more overt and recordable than changes in penis and testicle size in boys.

For boys, an increase in testicular size occurs at 9.5.13.5 years (average 12 years) of age, which is followed by the growth of pubic hair (Marshall & Tanner, 1970). The testes and scrotum begin to grow, and the scrotum thins, darkens, and becomes pendulous. The penis lengthens and widens, taking several years to reach full size. Sperm production coincides with testicular and penile growth, generally occurring at age 13.5.14 years. Facial hair appears about three years after the onset of pubic hair growth, first in the mustache area above the upper lip, and later at the sides of the face and on the chin. The density and distribution of hair growth varies considerably among adult men, and is correlated more with genetic factors than with hormone levels (Lee, 2003). Gynecomastia (visible breast tissue) occurs in approximately two-thirds of males some time during puberty. Onset may coincide with the onset of puberty but primarily begins at ages 13.14, before testosterone levels have reached adult levels. Most commonly it persists for 18.24 months then regresses by age 16 years (Zosi et al., 2002).

This concludes that adolescents lack knowledge about the sequence of development of secondary sexual characters but it is evident that it is a must to include this in sex education because by educating them we can dilute the confusion and then finally this will lead to decrease in so many psycho-social issues of adolescents.

Prevalence of Knowledge of Sexually Transmitted Diseases and AIDS

The assessment of STDs and AIDS is done separately.

In the sample study, none of the participants had good knowledge of names of STDs, 86% of them had partial knowledge and 14% had no knowledge at all about the names of STDs.

Partial knowledge is just because of AIDS because none of them could say a name other than AIDS.

Regarding prevention of STDs, majority of them (61%) had partial knowledge, 36% had no knowledge whereas only 3% had good knowledge of prevention from STDs.

Knowledge of mode of transmission and prevention of AIDS is comparatively better than knowledge of STDs; 8% and 6% had good knowledge regarding mode of transmission and prevention of AIDS respectively.

68% and 66% had partial knowledge regarding mode of transmission and prevention of AIDS respectively.

24% and 28% had no knowledge regarding mode of transmission and prevention of AIDS respectively.

However, there is a paucity of adequate age-specific data related to the transmission of STDs and HIV/AIDS in India, and the issue of STDs among adolescents has been largely ignored by policy makers.

Prevalence of Knowledge of Methods of Population Control

The overall prevalence of knowledge of methods of population control is 91% but only 6% had good knowledge among them.

85% of them had partial knowledge whereas 9% had no knowledge at all regarding the methods of population control.

By this we can conclude that adolescents lack knowledge about population controlling measures, what they know is maximally about condoms so there is dire need to improve their knowledge regarding contraceptives.

According to DLHS 3, about 78% of unmarried women between 15 and 24 years had the knowledge of male sterilization and 90.5% had knowledge of female sterilization. As regards spacing methods, 90.4% had knowledge of pills, 88.3% had knowledge of condom/Nirodh and 69.6% had knowledge of IUD. About two-thirds (60.1%) of unmarried women had knowledge of emergency contraception and 63.3% had knowledge about injectables.

Contraceptive awareness is usually about sterilization, which is unsuitable for most adolescents. Knowledge of HIV/AIDS, safe sex and preventive behavior (like use of condoms) is low, across all ages and education levels.

Poor access to contraception and contraceptive failure, lack of information or misinformation regarding reproduction as also the incidence of rape contributes to the high rate of abortion among adolescents (MOHFW, Country Paper, 1998).

A study carried out to assess the knowledge regarding KAP of contraception among students in Sikkim shows that 98% (153/156) of the students had knowledge about family planning and 86% (134/156) of them had heard about contraceptives. Most of them knew about condoms (85%) and contraceptive pills (40%) but knowledge about permanent methods and Cu-T was poor (average 12%). Most students thought contraceptives were to be used to prevent
unwanted pregnancy (35%) and for birth spacing (30%). 11% of students had used some form of contraceptive in the past and 7% were currently users. The most commonly used contraceptives were condoms, followed by combined use of OCP and condom.

A descriptive study was carried out to assess the knowledge of students of senior secondary schools of Ludhiana. A significantly higher proportion of boys (85.1%) than girls (47.3%) knew about condoms (p=0.0000), but more girls (87.3%) than boys (78.5%) knew about oral contraceptive pills (p=0.0000). Knowledge of other contraceptive methods in both sexes was very poor.

There are two main elements to contraceptive use. First, there is a lack of knowledge of appropriate methods for adolescents. The majority of adolescents know about sterilization, which is unsuitable for them. Female sterilization constitutes the most common method of contraceptive use and accounts for most of the increase in family planning practice. Second, even when knowledge of contraceptive methods may be prevalent, the contraceptive needs for temporal/spacing methods (which are most appropriate for adolescents) may not be met. Surveys show that only one-third of the need for spacing methods is satisfied, whereas a far larger proportion of the need for permanent, or limiting methods, was met (NFHS 1998-99). For adolescents, this unmet need must be even greater. Availability of this basic service would be instrumental in reducing a host of reproductive health-related problems.

Knowledge of family planning methods is a precondition for their use. Knowledge of different family planning methods, especially spacing methods, is essential for providing young couples with the means to delay or avoid a pregnancy. Knowledge of condoms is also important for the practice of safe sex, and knowledge of emergency contraception is essential for avoiding an unwanted pregnancy after unprotected sex.

Almost all women and men aged 15–24 years know at least one method of contraception and at least one modern method.

Awareness of sterilization, especially of female sterilization, is very widespread. Knowledge of spacing methods is less common, even though this type of knowledge is crucial for young persons who will be initiating family building soon or are in the early stages of family building (NFHS 3).

A dual purpose of protecting against pregnancy and reducing the risk of acquiring and spreading sexually transmitted infections, knowledge of condoms is particularly important among youth.

In all the cities where separate estimates of contraceptive knowledge are available, at least 95% of young men know about condoms, with a very small difference in the awareness of condoms among slum and non-slum dwellers.

**Section III: Association between Knowledge and Demographic Variables**

The current study determined the association between knowledge and demographic variables.

There is a significant association between the knowledge and age of the participants.

Chi-square=40.94; ‘P’=0.000000298

There is a significant association between the knowledge and literacy status of the participants.

Chi-square=91.47; ‘P’=<0.0000001

There is a significant association between the knowledge and literacy status of father of the participants.

Chi square=81.09; ‘P’=<0.0000001

There is no significant association between the knowledge and socio-economic status.

Chi-square=3.612; ‘P’=0.3066

There is no significant association between the knowledge and religion.

Chi-square=2.919; ‘P’=0.4043

**Conclusion**

Majority of the sample were in age of 15 years (29%), followed by 16 years (27%); then 17 years (24%) and 18 years (20%).

Most of the adolescents (38%) had education up to middle school, followed by high school (30%). There were 9% illiterates in the study population.

In the sample, Hindus formed 48% of the population and Muslims constituted 52%.

Majority of the adolescents belonged to lower socio-economic status; 83% from upper lower class and 17% from lower middle class according to modified Kuppuswami scale.

Majority of participants’ fathers were illiterate (46%), followed by 24%, studied up to primary division, 9% up to middle school, 16% up to high school and only 5% up to >high school.

Majority of the participants had either no knowledge (36%) or partial knowledge (45%) regarding the development of sexual characters and only 4% had excellent knowledge and 15% had good knowledge.
Majority of the participants had no knowledge (51%) about the sequence of development of secondary sexual characters. Only 25% could mention increment in height and deepening of voice at their age. Only 1% were able to tell about testicular increment in size and pubic hair.

Majority of them had partial knowledge regarding names, modes of transmission and prevention of STDs/AIDS.

Majority of them had partial knowledge (85%) regarding the methods of population control.

There was significant association between knowledge and literacy status of participant, age and literacy status of father.

There was no significant association between knowledge and socio-economic status and religion.

Sexual and reproductive health is a part of physical and emotional well-being. Sexual health programs should be included in the school curriculum for its effectiveness, acceptability and low cost.

The study came to the conclusion that adolescents of age group 15–19 years of urban slum of East Delhi lack in knowledge about development of secondary sexual character, STDs and family planning. Significant association of knowledge is seen with age, literacy status of adolescents and literacy status of their fathers, whereas no significant association was seen with religion and socio-economic status of the participants.

So we can conclude that incorporating sex education in school curriculum is the need of the hour.

The information can be incorporated as a graded program starting early in class room to maintain sustained levels of knowledge.

Educational programs can increase awareness about reproductive health, but in the absence of appropriate health services, this awareness may not always translate into appropriate help seeking by adolescents.

Education is the most important tool for improving the level of knowledge. Lower classes should be talked about development and higher classes about procreation.

Parents should provide children friendly environment and make it possible so that they can clear their doubts at home rather than finding improper ways for that. Teachers and parents should become the first source of Information.

**Conflict of Interest:** None

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### Annexure A. Demographic Proforma

| S.no. | Questions                  | Response |
|-------|----------------------------|----------|
| 1     | Name                       |          |
| 2     | Age                        |          |
| 3     | Religion                   | 1. Hindu  |
|       |                            | 2. Muslim |
|       |                            | 3. Christian |
|       |                            | 4. Others |
| 4     | Address                    |          |
| 5     | Educational status         | 1. Illiterate |
|       |                            | 2. Primary |
|       |                            | 3. Middle school |
|       |                            | 4. High School |
|       |                            | 5. Intermediate |
|       |                            | 6. Graduate |
|       |                            | 7. Professional |
| 6     | Occupation                 | 1. Unemployed |
|       |                            | 2. Unskilled |
|       |                            | 3. Semi-skilled |
|       |                            | 4. Skilled worker |
|       |                            | 5. Clerk, shopkeeper, farmer |
|       |                            | 6. Service class |
|       |                            | 7. Professional |
| 7     | Father’s Name              |          |
| 8     | Father’s Age               |          |
| 9     | Father’s occupation        | 1. Unemployed |
|       |                            | 2. Unskilled |
|       |                            | 3. Semi-skilled |
|       |                            | 4. Skilled worker |
|       |                            | 5. Clerk, shopkeeper, farmer |
|       |                            | 6. Service class |
|       |                            | 7. Professional |
| 10    | Father’s Education         | 1. Illiterate |
|       |                            | 2. Primary |
|       |                            | 3. Middle school |
|       |                            | 4. High School |
|       |                            | 5. Intermediate |
|       |                            | 6. Graduate |
|       |                            | 7. Professional |
| 11    | Mother’s name              |          |
| 12    | Mother’s age               |          |
| 13    | Mother’s occupation        | 1. Unemployed |
|       |                            | 2. Unskilled |
|       |                            | 3. Semi-skilled |
|       |                            | 4. Skilled worker |
|       |                            | 5. Clerk, shopkeeper, farmer |
|       |                            | 6. Service class |
|       |                            | 7. Professional |
| 14    | Mother’s education         | 1. Illiterate |
|       |                            | 2. Primary |
|       |                            | 3. Middle school |
|       |                            | 4. High School |
|       |                            | 5. > High school |
| 15    | Total family income        | 1. > 1520 |
|       |                            | 2. 1521-4555 |
|       |                            | 3. 4556-7593 |
|       |                            | 4. 7594-11361 |
|       |                            | 5. 11362-15187 |
|       |                            | 6. 15188-30374 |
|       |                            | 7. > 30375 |
| 16    | Socio-Economic Status      | 1. Upper |
|       |                            | 2. Upper middle |
|       |                            | 3. Lower middle |
|       |                            | 4. Upper lower |
|       |                            | 5. Lower |
Annexure B. Questionnaire on sexual knowledge

Have you ever heard about these words?
I. Puberty
II. School age
III. STD
IV. AIDS
V. Rape
VI. Abortion
VII. Intercourse
VIII. Protected sex
IX. Masturbation
X. Night emission

Changes during Adolescence/puberty are
I. Rapid gain of weight and height
II. Change in build
III. Facial hair
IV. Change in voice
V. Development of sex organs (Penis/Testes)
VI. Night emission
VII. Pubic hair
VIII. Can’t say

What do you feel about these (pubertal) changes?
i. Normal phenomenon
ii. Onset of maturity
iii. Unhealthy
iv. Shy
v. Guilty
vi. Nothing

Can you tell me the sequence of these pubertal changes?
I. Yes
II. No

If yes then please tell the sequence/order in ascending order according to Increase in age?
I. Testes increase in size
II. Genital hair
III. Axillary hair
IV. Facial and body hair
V. Penis increase in size
VI. Height velocity peaks
VII. Deepening of voice

Have you ever received any sex education?
I. Yes
II. No

If yes; by whom?
I. Teacher
II. Parents
III. Friends /siblings
IV. Text books/magazines/banned literatures/blue films/internet
V. Others(workshop/training session)

Do you think sex education is necessary?
I. Yes
II. No
III. Don’t know

Have you ever had night emission/wet dreams?
I. Yes
II. No

If yes, what do you feel about it?
I. Onset of maturity
II. Exciting
III. Unhealthy
IV. Shy
V. Guilty
VI. Nothing

Do you practice masturbation?
I. Yes
II. No

If yes, then frequency/week of masturbation?
I. <5
II. 5-10
III. 10-15
IV. >15

What do you feel about masturbation?
I. Guilty
II. Exciting
III. Unhealthy
IV. Shy
V. Fatigued
VI. Nothing

Do you know that certain diseases are transmitted via sex?
i. Yes
ii. No

If yes then can you name a few?
i. Syphilis
ii. Gonorrhea
iii. AIDS
iv. Don’t know

STD’s can be prevented?
I. Yes
II. No
If yes then what are the measures?
I. Use of condom
II. Clean/Sterile needles
III. Checking blood before transfusion
IV. Relationship with one partner
V. Good hygiene
VI. Don’t know

Have you ever heard about AIDS?
I. Yes
II. No

How does AIDS spread?
i. Sexual contact
ii. Contaminated blood
iii. Contaminated syringes
iv. Multiple sex partners
v. To neonate from mother
vi. Don’t know

How can you prevent yourself from getting AIDS?
i. Condom usage
ii. Sterile needles/syringes
iii. Checking blood before transfusion
iv. Relationship with one partner
v. HIV Test
vi. Don’t know

Does kissing transmit STD’s /AIDS?
I. Yes
II. No

Does mosquito bite transmit AIDS?
I. Yes
II. No

Can handshake transmit STD’s/AIDS?
I. Yes
II. No

Have you ever discussed your sexual problems?
I. Yes
II. No

If yes, with whom?
I. Teacher
II. Friend/siblings
III. Doctor
IV. Parents

Have you ever heard about contraceptives?
I. Yes
II. No

If yes, then knowledge about contraceptive received from?

I. TV
II. Radio
III. Magazine
IV. Teacher
V. Friend/siblings
VI. Family
VII. Others

Can you name a few contraceptives?

I. Condoms
II. Oral pills
III. Cu-t
IV. Permanent methods (operations)
V. Injections
VI. Rhythm methods
VII. Absenteeism

Contraceptives are available with?

I. Chemist
II. General store
III. Dispensary
IV. Health worker
V. Don’t know

What are the uses of contraceptives?

I. Prevention of STDs
II. Prevention of AIDS
III. Prevention of Pregnancy
IV. Don’t know
V. Any other use

Have you ever had sex?

I. Yes
II. No

Have you ever used contraceptive?

I. Yes
II. No

If you had sex with one partner, who was the partner?

I. Male
II. Female

If multiple partners, then partners are

I. Professionals
II. Non professional
III. Can be any one of above these
## Annexure C. Codes used for assessment of level of knowledge

| Code | Assessment of knowledge of secondary sexual characters | Excellent | Partial | No knowledge |
|------|--------------------------------------------------------|-----------|---------|--------------|
| 1.   | Rapid gain of weight and height                        |           |         |              |
|      | Change in build                                        |           |         |              |
|      | Facial hair                                            |           |         |              |
|      | Change in voice                                        |           |         |              |
|      | Development of sex organs                              |           |         |              |
|      | Night emission                                         |           |         |              |
|      | Pubic hair                                             |           |         |              |
|      | (7 correct answers)                                    |           |         |              |
|      | Good                                                   | (4-6 answers) |         |              |
|      | Partial                                                | (1-3 answers) |         |              |
|      | No knowledge                                           | No answer |         |              |
| 2.   | Sequence of development of secondary sexual characters  | Clubbed together | Testes increase in size | Height velocity peaks/ Deepening of voice |
|      | Clubbed together                                       |           |         |              |
|      | Genital hair                                           |           |         |              |
|      | Penis increase in size                                 |           |         |              |
|      | Clubbed together                                       |           |         |              |
|      | Axillary hair                                           |           |         |              |
|      | Facial & body hair                                      |           |         |              |
|      | Clubbed together                                       |           |         |              |
|      | Height velocity peaks/ Deepening of voice              |           |         |              |
| 3.   | Assessment of knowledge regarding STDs ( types )       | Good      | Partial | No knowledge |
|      | Syphilis                                               |           |         |              |
|      | Gonorrhoea                                             |           |         |              |
|      | AIDS                                                   | Any two or more of the above |         |              |
|      | Partial                                                | Any 1 of the above |         |              |
|      | No                                                     | No answer |         |              |
| 4.   | Assessment of knowledge regarding STDs ( prevention )  | Good      | Partial | No knowledge |
|      | Condom usage                                           |           |         |              |
|      | Clean/sterile needles                                  |           |         |              |
|      | Checking blood before transfusion                      |           |         |              |
|      | Relationship with one partner                          |           |         |              |
|      | Hygiene                                                | 3 to 5 of the above |         |              |
|      | Partial                                                | 1 to 3 of the above |         |              |
|      | No                                                     | No response |         |              |
| 5.   | Assessment of knowledge regarding AIDS (Transmission)  | Good      | Partial | No knowledge |
|      | Sexual contact                                         |           |         |              |
|      | Contaminated blood                                      |           |         |              |
|      | Contaminated syringes                                   |           |         |              |
|      | To neonate from mother                                 |           |         |              |
|      | Multiple sex partners                                   | 3-5 of the above |         |              |
|      | Partial                                                | 1 to 2 of the above |         |              |
|      | No                                                     | No response |         |              |
| 6.   | Assessment of knowledge regarding AIDS (Prevention)    | Good      | Partial | No knowledge |
|      | Condom usage                                           |           |         |              |
|      | Sterile needles/syringes                               |           |         |              |
|      | Checking blood before transfusion                       |           |         |              |
|      | Relationship with one partner                          |           |         |              |
|      | HIV Test                                               | 3 to 5 of the above |         |              |
|      | Partial                                                | 1 to 2 of the above |         |              |
|      | No                                                     | No response |         |              |
| 7. | Assessment of knowledge regarding population control measures | Good | Condoms  
Oral pills  
Cu-t  
Injectable contraceptives  
Operations  
Rhythm methods  
Abstinence  
(4 to 7 of the above) |
|---|---|---|---|
|    | Partial | Any 1 to 3 of the above |
|    | No      | No response |
Annexure-D: Questionnaire in Hindi

1- क्या आपने इन शब्दों के बारे में सुना है?

| शब्द                          | हैं     | नहीं     |
|-------------------------------|--------|----------|
| 1. परिपक्वता/किशोरवस्त्र     |        |          |
| 2. स्कूल जाने की उपलब्धि   |        |          |
| 3. ऐड्स                          |        |          |
| 4. यौन सम्बन्धों से फ़ेलने वाली बीमारिया |        |          |
| 5. बलात्कार                    |        |          |
| 6. गर्भावस्था                    |        |          |
| 7. सम्भोग/शारीरिक मेल जौल  |        |          |
| 8. सूक्ष्मजन्तु सम्भोग       |        |          |
| 9. हस्त मेधूत               |        |          |
| 10. स्वास्थ दौशा              |        |          |

2- किशोरवस्त्र के दौरान शरीर में क्या क्या बदलाव होते हैं?

| बदलाव            | हैं     | नहीं     |
|--------------------|--------|----------|
| 1. वजन तथा लम्बाई का शीर्ष बना |        |          |
| 2. शरीर का वनावत में बदलाव   |        |          |
| 3. चेहरे व शरीर पर बाल   |        |          |
| 4. आवाज में बदलाव       |        |          |
| 5. जनन खंड का विकास   |        |          |
| 6. स्वास्थ दौशा   |        |          |
| 7. जनन बाल             |        |          |
3- आप इन बदलाव के बारे में क्या सोचते हैं?

| संख्या | स्पष्ट ढंग से घटाना | परिपक्वता का होना | गर्मी की नींदाची | शरीर की नींदाची | दौड़ी भावना | कुछ नहीं |
|--------|-------------------|-------------------|-------------------|-------------------|----------------|------------|

4- इन ऊर्जा में होने वाले बदलाव के सही ऋतु के बारे में आपको जानकारी है?

| नंबर | हैं | नहीं |
|-------|-----|------|

5- यदि हां तो क्या आप इन बदलावों के उद्ध के साथ बच्चों को देखते हुए ब्रम्ह के बारे में बता सकते हैं?

| संख्या | प्रज्ञन के आकार में उच्ची | जननागर पर बाल | कान्त पर बाल | चेहरे का और पर बाल | लिंग के आकार में उच्ची | लम्बाई का बली | आवज में भाँगने |
|--------|-------------------------|------------------|----------------|------------------|-----------------|----------------|----------------|

6- क्या आपने कभी यौन सशक्तिकरण शिक्षा मिली है?

| नंबर | हैं | नहीं |
|-------|-----|------|
7-वदि हा, तो किससे?

| संख्या | सूची  |
|-------|--------|
| 1.    | अश्वायक |
| 2.    | माता पिता |
| 3.    | दोस्तों से/ भाई बहनों से |
| 4.    | किताबों/ पत्रिकाएं/ प्रतिविंशित साहित्य/ व्यूह/ हिंदी संस्कृति से/ इत्यादि से |
| 5.    | अन्य( कार्यशाला/ जैनिना ) |

8-व्या आपको लगता है कि यौन संमिश्रण जिक्का जरूरी है?

| संख्या | सूची  |
|-------|--------|
| 1.    | है |
| 2.    | नहीं |

9-व्या आपको कभी स्वप्न दोशु हुआ है?

| संख्या | सूची  |
|-------|--------|
| 1.    | है |
| 2.    | नहीं |

10-वदि हा, तो आपको इस बारे में व्या मेहसूस होता है?

| संख्या | सूची  |
|-------|--------|
| 1.    | परिप्रवरता का होना |
| 2.    | उल्लेख |
| 3.    | रोग की नीशानी |
| 4.    | उत्तम की नीशानी |
| 5.    | दौसी भवन |
| 6.    | कुछ नहीं |
11- क्या आप हस्त मेदून करते हैं?

|   |   |
|---|---|
| 1. हाँ |   |
| 2. नहीं |   |

12- यदि हाँ, तो हफ्ते में कितनी बार?

|   |   |
|---|---|
| 1. >5 |   |
| 2. 5-10 |   |
| 3. 10-15 |   |
| 4. >15 |   |

13- आपको हस्त मेदून के बारे में क्या मेहसूस होता है?

|   |   |
|---|---|
| 1. उत्सुक |   |
| 2. चेहरे की दृष्टि |   |
| 3. हाथ की दृष्टि |   |
| 4. दौरी भावना |   |
| 5. कमजोरी |   |
| 6. कुछ नहीं |   |

14- क्या आपको पता है कि कुछ वीमरीया वृन्द सम्योग से फेलती है?

|   |   |
|---|---|
| 1. हाँ |   |
| 2. नहीं |   |
15- यदि तो कुछ के नाम बता सकते हैं?

|   | सिकिलीस | सूजाक | एड्स | नहीं पता |
|---|-----------|-------|-----|---------|
| 1 |           |       |     |         |
| 2 |           |       |     |         |
| 3 |           |       |     |         |
| 4 |           |       |     |         |

16- गुण यंगो/ श्रीन सम्मित बीमारियो को रोका जा सकता है?

|   | हैं | नहीं |
|---|----|------|
| 1 |    |      |
| 2 |    |      |

17- यदि हैं, तो कैसे?

|   | कॉन्डोम का उपयोग | जीवांश रक्षत सुख | खून चलाने से पहले उसके लिए जानकारी करना | एक ही व्यक्ति से अर्थीक सम्बन्ध | सफाई रखना | नहीं पता |
|---|------------------|----------------|--------------------------------|--------------------------------|-------------|---------|
| 1 |                  |                |                               |                                 |             |         |
| 2 |                  |                |                               |                                 |             |         |
| 3 |                  |                |                               |                                 |             |         |
| 4 |                  |                |                               |                                 |             |         |
| 5 |                  |                |                               |                                 |             |         |
| 6 |                  |                |                               |                                 |             |         |

18- क्या कभी ईड्स के बारे में सुना है?

|   | हैं | नहीं |
|---|----|------|
| 1 |    |      |
| 2 |    |      |
### बद्दल हा, तो बताये एड्स कसे फेलता हो?

|   |   |
|---|---|
| 1. | यौन सम्बन्ध से   |
| 2. | सामान्य खान से   |
| 3. | सामान्य स्वास्थ्य   |
| 4. | एक ही स्वास्थ्य से जारी रखने से   |
| 5. | भाव से बच्चे को   |
| 6. | नहीं पता   |

### एड्स को होने से कैसे रोका जा सकता हो?

|   |   |
|---|---|
| 1. | कोलोरोज का उपयोग   |
| 2. | जीवन ऎंधन सुधार   |
| 3. | खान पोषण से पहले उसके जाख करना   |
| 4. | एक ही स्वास्थ्य से जारी रखने से   |
| 5. | एच. आड्ड. शी. की जानकारी   |
| 6. | नहीं पता   |

### क्या चुम्बन से एड्स फेलता है?

|   |   |
|---|---|
| 1. | है   |
| 2. | नहीं   |

### मच्छर के काटने से एड्स फेलता है?

|   |   |
|---|---|
| 1. | है   |
| 2. | नहीं   |
23- क्या हाथ मिलने से ऐटस क़ेलता है?

|   |   |
|---|---|
| 1. हाँ |   |
| 2. नहीं |   |

24- क्या कभी अपनी यौन सम्बंधित परेशानियों के बारे में कभी किसी से बात की है?

|   |   |
|---|---|
| 1. हाँ |   |
| 2. नहीं |   |

25- बदिद हा, तो किससे?

|   |   |
|---|---|
| 1. अध्यापक |   |
| 2. माता पिता |   |
| 3. दोस्तों से/ भाई बेहनों से |   |
| 4. चिकित्सक |   |

26- क्या कभी गर्भ निरोधक साभों के बारे में सुना है?

|   |   |
|---|---|
| 1. हाँ |   |
| 2. नहीं |   |

27- बदिद हा, तो किससे?

|   |   |
|---|---|
| 1. टी.वी |   |
| 2. रेडियो |   |
| 3. पत्रिकायों से |   |
| 4. अध्यापक से |   |
| 5. माता पिता |   |
| 6. दोस्तों से/ भाई बेहनों से |   |
| 7. अन्य |   |
### आक्षेप

#### 28- कुछ गर्भ निरोधक साधनों के नाम बता सकते है?

|    | 1. कोडोम   |
|----|-------------|
|    | 2. गोलिया   |
|    | 3. कोपर ती   |
|    | 4. ओप्सन   |
|    | 5. इन्जेक्टियल्स   |
|    | 6. प्राप्त तरीके   |
|    | 7. पहेज़ से   |

#### 29- गर्भ निरोधक साधन कहां से मिलते है?

|    | 1. द्वाइ की दुरुकान   |
|----|-------------------|
|    | 2. जनरल स्टोर   |
|    | 3. डिस्पेंसरी   |
|    | 4. स्वास्थ्य कार्यालय   |
|    | 5. नहीं पता   |

#### 30- गर्भ निरोधक साधनों के बजा क्या फायदे है?

|    | 1. गुप रोगों की रोकथाम   |
|----|-------------------|
|    | 2. एड्स की रोकथाम   |
|    | 3. गर्भ की रोकथाम   |
|    | 4. नहीं पता   |
### Annexures

31- क्या कभी किसी से दीन सम्बन्ध हुआ है?

|   |   |
|---|---|
| 1. है  |   |
| 2. नहीं |   |

32- यदि हा, तो क्या गर्भ साधनों का उपयोग किया था?

|   |   |
|---|---|
| 1. है  |   |
| 2. नहीं |   |

33- यदि एक हि श्याति के साथ दीन सम्बन्ध हुआ था, तो वो श्याति कौन था?

|   |   |
|---|---|
| 1. पुरुष  |   |
| 2. स्त्री  |   |

34- यदि एक से अधिक के साथ दीन सम्बन्ध हुआ था, तो वो साधी कौन थे?

|   |   |
|---|---|
| 1. पैंजेवर  |   |
| 2. गैर पैंजेवर |   |
| 3. दोनों में से कोई भी |   |
Annexure E. Modified Kuppu Swami Socioeconomic Status Scale

(A) Education Score

| Rank | Score | Education                                      |
|------|-------|------------------------------------------------|
| 1    | 7     | Profession or Honours                          |
| 2    | 6     | Graduate or post graduate                      |
| 3    | 5     | Intermediate or post high school diploma       |
| 4    | 4     | High school                                    |
| 5    | 3     | Middle school                                   |
| 6    | 2     | Primary school                                  |
| 7    | 1     | Illiterate                                      |

(B) Occupation Score

| Rank | Score | Occupation                                      |
|------|-------|------------------------------------------------|
| 1    | 10    | Profession                                     |
| 2    | 6     | Semi-profession                                |
| 3    | 5     | Clerical, shop-owner, farmer                   |
| 4    | 4     | Skilled worker                                 |
| 5    | 3     | Semi-skilled worker                            |
| 6    | 2     | Unskilled worker                               |
| 7    | 1     | Unemployed                                      |

(C) Monthly family income in Rs

| Rank | Score    | Monthly family income in Rs                      |
|------|----------|-------------------------------------------------|
| 1    | 12       | ≥32050                                          |
| 2    | 10       | 16020-32049                                     |
| 3    | 6        | 12020-16019                                     |
| 4    | 4        | 8010-12019                                      |
| 5    | 3        | 4810-8009                                       |
| 6    | 2        | 1601-4809                                       |
| 7    | 1        | ≤1600                                           |

Total score | Socio-economic status
-------------|-------------------------|
26-29 | Upper (i)  
16-25 | Upper middle (ii)  
11-15 | Middle/ lower middle (iii)  
5-10 | Lower/ upper lower (iv)  
<5 | Lower (v)