

Original Research Article

## Study on the Reproductive Health Status of Adolescent Boys and Girls under Urban School Settings in Kolkata through the Application of Psychometrics

Kriti Sarkar<sup>1</sup>, Anjali Ray<sup>2</sup>

<sup>1</sup>Assistant Professor, Dept. of Basic Science and Humanities, University of Engineering and Management, Kolkata

<sup>2</sup>Professor, Dept. of Applied Psychology, University of Calcutta, Kolkata, India

Corresponding Author: Kriti Sarkar

### ABSTRACT

**Background:** In the faces of the new challenges and restricted resources in a developing country like India, newer researches are required to developing databases for improved maternal health, reduced infections, and better nutritional level of the child bearing aged adolescents. The study aimed to assess using the questionnaire to measure the knowledge, attitude and behavior/practice with respect to reproductive health status and nutrition among school students of Urban Kolkata.

**Methods:** The study first identified the major components of Reproductive Health (sexual and nutritional components) among the secondary school students and secondly assessed the nature of Reproductive Health Status of secondary school students with respect to sex (male and female), socioeconomic status (upper, upper middle, lower middle) on the basis of statistical tests of significance- one-way ANOVA, 't' between percentages etc. using a Reproductive Health Inventory which was developed for this study.

**Findings:** The profile of Reproductive health of adolescents may be considered as a combination of six components namely 'Sex Education', 'Openness about Sex', 'Sexual Activities', 'Sexual Health Knowledge', 'Reproductive Health Knowledge' and 'Nutrition'. It implied that reproductive health status as reported by secondary school students were generating from their personal and situational factors.

Results highlighted that while the overall reproductive health status including its components of *sex education, openness about sex, sexual health knowledge and reproductive health knowledge* of the female students was relatively better than that of the male students, at the same time, the level of *sexual activities* was more prominent in male students than female students.

Again, students belonging to different SES groups significantly differed in terms of their level of *overall reproductive health status, sex education, openness about sex, sexual activities, sexual health knowledge and reproductive health knowledge*. The trend of knowledge and attitude in all the aforesaid domains was noted to be higher in students belonging to upper SES, followed by Upper middle and then lower middle.

**Keywords:** Reproductive Health, Sexual Health, Nutrition, Adolescents, Psychometrics.

### INTRODUCTION

Reproductive health is most important to general health of any individual and it is generally recognized as a, "state of complete physical, mental and social well-being and not the mere absence of disease or

infirmity" (United Nations Population Information Network (POPIN)/UNFPA, 2010) in all matters relating to reproductive system and its functions and processes. Reproductive health therefore implies that "people are able to have a responsible,

satisfying and safe sex and that they have the capability to reproduce and the freedom to decide if, when and how often to do so” (World Health Organization, 2004). Reproductive health is dependent upon development stage and physiological functioning, social learning, experiences and values, health beliefs and intentions of individuals, etc. and it is affected and influenced by different life phases of infancy, childhood, adolescence and old age. Since adolescence is characterised by uneven progressions in the development of brain structures and mental processes that are associated with emotions, interpersonal relationships (empathy, social bonding), aggression, impulsive behaviours and the capacity for logical and critical thought, it is also a period associated with confusion, frustration, despair and risk-taking behavior (Asia, 2004; Bhan, Mahajan and Sondhi, 2004). World Health Organisation Global Reproductive Health Strategy (WHO, 2004, Document No.WHO/RHR/04.8) addressed the sexual and reproductive health awareness, their needs and their problems as one of their crucial strategies. Most of the adolescents in developing countries face health risks with too little factual information, too little guidance on sexual responsibility and lack of access to health care. Their education and awareness about their reproductive health, their readiness to take on adult roles and responsibilities, the support they receive from their families, peer groups and health care facilities in the community etc. determine their future. Evidence suggests that current status of knowledge and neglect can seriously jeopardize the health and future well-being of young people (Bott et al. Eds. WHO, 2003; 2006). Accordingly, sex education (Bhan et al., 2004) (for adolescents and their parents) helps in developing responsible attitudes and behavior towards sex. Sex education inculcates a scientific attitude towards natural sexuality, dispels myth and clarifies aspects of sexuality (Bhan et al., 2004). Parents and other family members work as agents to socialize adolescents into

healthy sexual beings; they provide them with accurate information about healthy and safe sex practices and foster responsible sexual decision-making skills (Eisenberg, Sieving, Bearinger, Swain & Resnick, 2006; Fisher, 1986; Miller, Kotchick, Dorsey, Forehand & Ham, 1998; Miller, Norton, Fan & Christopherson, 1998; Pick & Palos, 1995).

Adolescents today are growing up in circumstances quite different from those of their parents with greater access to knowledge through formal education, increasing need for technological skills like computer and internet literacy, different job opportunities and more exposure to new ideas through media, telecommunications and other avenues (UNFPA, Generation of Change: Young people and Culture, 2008). Rates of sexual initiation during young adulthood are rising or remaining unchanged in many developing countries including India (Ali and Cleland, 2005), childbearing and marriages are increasingly becoming unlinked (Bearinger et al, 2007) and high HIV prevalence adds to the risks associated with early sexual activity (Pettifor et al, 2004; Dixon-Mueller, 2009). Hence, in the faces of the new challenges and restricted resources in a developing country like India, newer researches are required to develop databases for improved maternal health, reduced infections, better nutritional level of the child bearing aged adolescents and their better mental health status. With its unique demographic feature and burden of trends of reproductive age group of population, the adolescent reproductive health care has received importance from National Health Programs. With this theoretical concept, the present study first aimed to identify the major components of Reproductive Health in secondary adolescent school students of Kolkata; secondly to assess the nature of Reproductive Health among the students.

The following objectives of the present study that have been used in carrying out the study:

1. To study the nature of the attributes of Reproductive Health Status and to develop an inventory for assessing the status of reproductive health for secondary school students.
2. To study the nature of similarities and dissimilarities of the components of reproductive health of secondary school students with respect to their sex (male and female).
3. To study the nature of reproductive health status of the secondary school students with respect to their socio-economic status (upper, upper middle, lower middle, upper lower and lower).

### **Hypotheses**

H1. The nature of reproductive health status of secondary school students varies in terms of the sex (male and female).

H2. Irrespective of sex (male and female) the nature of reproductive health status of secondary school students varies in terms of their socio-economic status (upper, upper middle, lower middle, upper lower and lower).

## **MATERIALS AND METHODS**

### **Variable under study:**

#### **Reproductive health:**

The reproductive health of the students was defined as that state of health where the individuals have the freedom to control reproduction and sexual actions by means of acquiring information about effective and safe sexual practices and methods of family planning free from the fear of pregnancy or disease (International Conference on Population and Development, Programme of Action, 1994). This phenomenon includes social, economic and cultural conditions of students and also social network (attachment with both parents and peer group) who have the onus of passing/acquiring the right information/education on safe sexual behaviours or risky sexual acts for bringing about awareness on sexual and reproductive matters (Panda and Sehgal, 2009; Rob et al., 2006), factors that affect decision making

regarding sexual acts (Allen et al. 2012; Byrnes, 2005 and Steinberg, 2001; Steinberg and Cauffman, 1999) and the overall sense of psychological well-being (Fisher and Mello, 2011). Regarding the assessment of reproductive health of students, two components- the sexual component and nutritional component of health as per World Health Organisation, 2009 concepts were considered as the measured variable of the present study.

- Sexual health component: A central aspect of human health is sex, sexual activities and reproduction and sexuality encompasses attitudes, knowledge, behaviours and mental health associated with sex.
- Nutritional component: Nutrition is the intake of food, considered in relation to the body's dietary needs, knowledge about diet during pregnancy, harmful behavior like smoking and drinking alcohol during pregnancy, consumption of health supplements, having regular exercise and the like.

Regarding assessment of these two reproductive health components of secondary school students, the present study has considered the concept of components (WHO, 2009) contained in the reproductive health: Sex Education, Openness about sex, Sex Activities, Sexual Health Knowledge, Reproductive Health Knowledge and Nutrition as measured components of the dependent variable.

### **Tool developed for hypotheses testing:**

#### **Reproductive Health Inventory**

Based on the Reproductive Health questionnaire designed under National Study on the Reproductive Health adolescence in Malaysia undertaken by National population and family planning development board (NPFDB) & Federation of Family Planning Associations of Malaysia (AFFPAM 1994-1997) for 13-19 year old adolescents and World Health Organization Reproductive Health Questionnaire, 2001, designed by John Cleland, "Asking Young People About Sexual And Reproductive Behaviours:

Illustrative Core Instruments, Geneva, WHO 2001” which has been used in several studies related to sexual and reproductive health (SRH) in many countries, an attempt had been made by the present investigator to develop the said measure for secondary school students and accordingly the number of items of the scale have been decided as 46 through certain steps as mentioned below:

At first following the WHO, 2001; AFFPAM, 1994-1997 ideas the present version of the inventory considered six components namely Sex Education, Openness About Sex, Sexual Activities, Sexual Health Knowledge, Reproductive Health Knowledge and Nutrition. Initially by reviewing literature and in consultation with different personnel working in this field, 90 items were identified covering six component areas (15 items for each of the components). In order to select the items for schedule following aspects were seriously checked by author:

- a) Un-prejudiced nature of the item.
- b) Clarity of expression and simple nature of construction in English language.
- c) Free of over-lapping of enquiry items, as far as practicable.
- d) No difficulty to link up with the operational definition of any particular area of enquiry.

Out of the said pool of items, 72 items (12 for each of the six domains) were retained in consultation with a board of five (5) experts (teachers of the department of Social Science of schools, assistant professor of department of Psychology, Bethune College, school counsellors, clinical psychologists and doctors) for framing a questionnaire in English. The respondents were required to rate each item on a Likert Scale (1 = “Strongly Disagree” to 5 = “Strongly Agree”).

The inventory was administered to 150 higher secondary students from various schools belonging to CISCE, CBSE and WBCHSE boards of education of studies. The data thus collected were computed to identify statistically valid items.

For testing the consistency of items of the scale ‘the item-total correlation’ was computed on the basis of the response of secondary school students for 72 items. Considering the ‘item-total correlation’ only 46 statistically valid items (above 0.40 validity level) were finally retained to use the scale for further probing.

At this stage, on the basis of valid items, the reliability of the scale was estimated by the techniques by Spearman Brown and Cronbach’s Alpha. The reliability coefficient ranges for the six subscales Spearman Brown  $r=0.91$ , Cronbach’s Alpha  $r=0.93$  were found to be high.

The inter-enquiry area (sex education, openness to sex, sex activities, sexual health knowledge, reproductive health knowledge and nutrition) correlation has indicated very high construct validity for the said scale. The individual item to item-total correlation of the scale ranged from 0.60-0.69 for Sex Education, 0.55-0.82 for Openness about Sex, 0.60-0.91 for Sexual Activities, 0.56-0.87 for Sexual Health Knowledge, 0.66-0.72 for Reproductive Health Knowledge, 0.61-0.89 for Nutrition.

The inventory had 46 items. The higher the score the better was reproductive health of the respondent. The instrument was a self-administering inventory that would be consistent with addressing the research aims and objectives. The inventory covering the various aspects of sexual and reproductive health related knowledge, attitudes and information seeking behaviour, and nutrition status requires approximately 15 minutes to complete.

**Sample selection:**

To verify the research hypotheses, data were collected from a group of properly chosen cross section of secondary schools located in Kolkata city and four zones were considered (east, west, north and south). Total number of schools gathered was 521. From the serial order of the published list of schools, 15 schools from each zone (5 schools (two boys, two girls

and one co-educational school) from 3 boards each) were selected respectively based on a random number table. In this regard, the decision was taken to follow a strategy of randomization without replacement. A total of 60 schools were approached by the researcher for data collection. Based on the responses of the school authority, from the list of 37 schools who agreed to give data, 3 willing schools from each zone (3 schools (one from each board) x 4 zones= 12 schools total) were randomly selected and approached for data collection.

A total of 960 students, 80 students from 12 schools with equiproportionate representation of male and female secondary students were randomly selected. At this stage in order to conduct an investigation within different schools with possible control over errors due to subject related variables, due attention was given to matching and controlling sample characteristics in terms of age, family structure, medium of teaching etc. by checking against the general inclusion and exclusion criterion as mentioned below.

*(1) General Inclusion Criterion*

1. Age range between 15-17 years.
2. Medium of instruction or academics English throughout for academics up till class XI
3. Students staying with parents.

*(2) General exclusion criterion*

1. Shifting of boards of education
2. History of any gap in the course of schooling
3. History of any chronic disorder.
4. Records of any indiscipline/misconduct behaviour

From the well-matched stratified sample of 815 students, 150 were used for tool development and local adaptation of questionnaires and pilot survey of the study and the rest 600 (equiproportionate number of male and female students) were used for the hypothesis testing. So a total of 750 secondary students were selected for the study.

**Ethical consideration**

Care was taken to ensure that the benefits of this research outweigh the risks of harm to participants and respect towards human dignity (Wassenaar, 2006). Informed consent and clauses of confidentiality were dealt with during the data collection session. The participants were explained the objectives of this research regarding reproductive health of adolescents and that they had to respond based on their present level of their knowledge, attitudes and practice towards sexual and reproductive issues. They were explained the potential benefits of this research. Although they were not benefitted directly from this research project, but this project shall help interventionists to plan and address adolescent sexual and reproductive health issues and gender dynamics. No individual emotions and sentiments were hurt during the course of this project.

**Statistical Treatment with the Data**

For fulfilling the specific objective (objective number 1), the descriptive statistics (mean, median, mode, SD, skewness, kurtosis, normality of the distribution) for the scores on reproductive health Inventory were tabulated as described under the following section. For fulfilling specific objective number 2, 3 and for the verification of the hypotheses H1 and H2, 't' tests and ANOVA for the scores on reproductive health status were processed to determine whether nature of reproductive health differs among the students in terms of their sex (male and female) and socio-economic status.

**RESULTS**

**a) Item validity**

At the initial stage for validity measurement, test items of Reproductive Health Inventory, the investigator took the help of the face validity for selection of items.

For item analysis of the preliminary selected distribution of items of Reproductive Health Inventory, the internal criterion method was followed to select both suitable components and related items that

correlate the most with total scores. Accordingly, for testing the consistency of the items of the selected domains, as well as, for total score, correlations were computed for the following three different sets of scores for the test.

I. ‘Individual Item Score- Individual Component Area Score’

II. ‘Individual Component Area Score- Total Score Of All Test Items’

III. ‘Individual Item Score- Total Score Of All Test Items’

Considering the correlation values (values above 0.40) few items and selected components were retained for the final scale. The result of the correlation analysis of the scale has been presented (table 1 for Reproductive Health Inventory)

**Table 1: Consolidated Picture of Item Validity Measures of Reproductive Health Inventory on the Basis of Data Collected from secondary school students (N=150)**

Serial No.	Component areas (Reproductive Health Inventory)	No. of items	Correlation (r) values		
			individual component area score- individual item score	Component area- total score	individual item score- item total score
1	Sex Education	2	0.70—0.71	0.70—0.78	0.60—0.69
2	Openness about Ses	4	0.47—0.72	0.65—0.79	0.55—0.82
3	Sexual Activities	5	0.67—0.81	0.79—0.83	0.60—0.91
4	Sexual Health Knowledge	12	0.47—0.76	0.66—0.83	0.56—0.87
5	Reproductive Health Knowledge	5	0.70—0.79	0.78—0.81	0.66—0.72
6	Nutrition	18	0.68—0.77	0.72—0.94	0.61—0.89

Results of the correlational analysis for item validity measure (Table 1) indicated that the total items of the scale along with their respective subscale for individual component areas (46 for Reproductive Health Inventory) had good amount of content validity.

**Construct Validity:**

In order to identify the nature of construct validity of the scale, an attempt had been made to test the inter-enquiry areas correlation for the developed scale (N=150).

**Table 2: The inter-component correlation matrix for Reproductive Health Inventory**

Components	Sex Education	Openness about Sex	Sexual Activities	Sexual Health Knowledge	Reproductive Health Knowledge	Nutrition
Sex Education	1					
Openness about Sex	.455	1				
Sexual Activities	.584	.613	1			
Sexual Health Knowledge	.760	.679	.820	1		
Reproductive Health Knowledge	.456	.586	.825	.858	1	
Nutrition	.654	.674	.547	.563	.658	1

The result of inter-component correlation matrix (Table 2) indicated that values or loading were positive in nature. Such pattern of course had indicated the *uni-directional* nature of the scale. The correlation also affirmed that the inventory was sound in factorial validity.

**Table 3 Consolidated Profile of the Validity Measures of Reproductive Health Inventory:**

The Scale	Enquiry/ Component Area	Items	Range of Correlation Values/ Validity Measures			
			Individual	Component	Individual	Inter
			Component area score- Individual item score	area- total score	Item score- item total score	component Areas Correlation
Reproductive Health Inventory	06	46	0.47—0.81	0.65—0.94	0.56—0.91	0.45—0.85

**b) Estimation of Reliability:**

**Table 4: The Reliability Values of the Reproductive Health Inventory:**

Reproductive Health Inventory and its Components	Reliability values (r)	
	Cronbach's Alpha	Spearman Brown
Reproductive Health Inventory	.93	.91
Sex Education	.46	.42
Openness about Sex	.51	.41
Sexual Activities	.80	.78
Sexual Health Knowledge	.87	.85
Reproductive Health Knowledge	.80	.79
Nutrition	.88	.82

N.B. The above-mentioned reliability values were significant at 0.01 level

As depicted from Table 4 the computed coefficients of correlation were found highly significant-relative of high reliability of the scale.

### c) Norms:

**Table 5: Mean, SD and norm range of Reproductive Health Inventory (N=150)**

Domains of Reproductive Health Inventory and components	No. of items	Mean	SD	Norm range
Reproductive Health Inventory	46	149.53	17.35	132.18—166.88
Sex Education	2	7.74	1.74	6—9.48
Openness about Sex	4	13.87	1.88	11.99—15.75
Sexual Activities	5	16.22	2.63	13.59—18.85
Sexual Health Knowledge	12	38.20	2.87	35.33—41.07
Reproductive Health Knowledge	5	18.64	1.15	17.49—19.79
Nutrition	18	55.81	10.99	44.82—6.8

In order to examine the influence of any intervening variability which might affect the homogeneity of the characteristics of secondary students from male N=300, female N=300 of secondary school students of CISCE (N=200), CBSE (N=200) and WBCHSE (N=200) boards, the data as collected using the General Information and Socio-economic Schedule regarding age

range, class, type of family and socio-economic status were processed applying Chi Square and presented in Table 6

The data collected for the sample group of the secondary school students did not reveal statistically significant mean differences for the matching criterion (Table 6).

**Table 6: Indicating frequency distribution of sample groups in terms of general characteristics and matching criteria (General Information and Socio-Economic schedule) (N=600)**

Types of Information on matching variables		CISCE	CBSE	WBCHSE	X <sup>2</sup> Values
Age	15—16 years	114	122	110	0.539
	16—17 Years	86	78	90	0.667
Sex	Male	108	102	90	1.68
	Female	92	98	110	1.68
Class	X	124	135	130	0.477
	XI	76	65	70	0.886
Type Of Family	Joint	68	69	70	0.029
	Nuclear	85	79	85	0.289
	Extended	47	52	45	0.542
Socio-Economic Status	Upper	150	151	117	5.712
	Upper Middle	31	32	51	6.684*
	Lower Middle	19	17	32	5.304

\*chi square values significant at 0.05 level

### Characteristic Features of Reproductive Health Status Profile

The total score of the Reproductive Health Inventory with 6 components- Sex Education, Openness about Sex, Sexual Activities, Sexual Health Knowledge, Reproductive Health Knowledge and

Nutrition were collected through the responses of secondary students (N=600) were processed and treated by psychometric tests to yield statistical measures of central tendencies (Mean) and dispersion (standard deviation, skewness and kurtosis) are presented in the following table 6.

**Table 7: Characteristic Features of Reproductive Health Status Profile along with its six components of the secondary school students (Total N=600)**

Component Areas	Mean,SD	Skewness (Sk) and Kurtosis (K)	Obtained score range	Unit Mean per Item
Reproductive Health Status	M=147.05 SD=23.27	Sk=-0.27 K=-0.088	123.78—170.32	3.20
Sex Education	M=7.75 SD=1.85	Sk=0.05 K=0.047	5.9—9.6	3.87
Openness about Sex	M=14.93 SD=2.90	Sk=-0.036 K=-0.282	12.03—17.83	3.73
Sexual Activities	M=16.55 SD=2.25	Sk=0.17 K=-0.063	14.87—19.37	3.31
Sexual Health Knowledge	M=37.98 SD=2.47	Sk=-0.377 K=1.534	35.51—40.45	3.16
Reproductive Health Knowledge	M=17.11 SD=2.24	Sk=-0.306 K=-0.346	14.87—19.35	3.45
Nutrition	M=52.73 SD=10.99	Sk=-0.218 K=-0.272	41.74—63.72	2.92

The values displayed in Table 7 characterize overall reproductive health status profile, including its six components, namely Sex Education, Openness About Sex, Sexual Activities, Sexual Health Knowledge, Reproductive Health Knowledge and Nutrition. Mean values indicated the trend of moderate level of reproductive health status of secondary school students.

It also indicated the probable normal distribution of score trends with slight

variations in their respective skewness and kurtosis.

The normality of distribution of score trends on the dependent variable (Reproductive Health) was tested using Kolmogorov-Smirnov and Shapiro Wilk tests on SPSS Ver. 20 and the results were non-significant stating that the data revealed near normal distribution of scores with slight variations in skewness and kurtosis. The test results have been presented in Table 8.

**Table 8: Tests of normality of the sample on the dependent variable (Reproductive Health Scores)**

Dependent Variable	Kolmogorov-Smirnov (N=600)		Shapiro-Wilk (N=600)	
	Statistic	Sig.	Statistic	Sig.
Reproductive Health Inventory scores	0.061	.200	0.992	.827

**Table 9: Characteristic features of Reproductive Health Inventory and its 6 component areas for six sample groups of secondary school students (males and females and 3 boards of education) (N=600)**

Component area of RHQ	Statistical measures	CISCE			CBSE			WBCHSE		
		Male (N=100)	Female (N=100)	Male + Female (N=200)	Male (N=100)	Female (N=100)	Male + Female (N=200)	Male (N=100)	Female (N=100)	Male + Female (N=200)
Reproductive Health Score	M	145.97	154.6	150.28	144.8	151.77	148.28	139.74	148.14	143.92
	SD	15.58	13.79	15.08	14.91	13.40	14.36	14.81	11.71	13.57
	SS	97.85	110.11	103.97	96.19	106.09	101.13	89.01	100.93	94.94
Sex education	M	7.38	8.82	8.1	7.18	8.93	8.05	6.55	7.70	7.12
	SD	0.92	1.15	1.05	1.09	1.43	1.84	1.32	1.31	1.32
	SS	93.15	119.31	106.47	89.44	121.84	105.53	98.18	99.07	88.33
Openness about sex	M	14.89	16.69	15.05	14.31	15.88	15.09	13.36	15.96	14.66
	SD	1.43	1.45	1.41	1.42	1.43	1.41	1.43	1.42	1.42
	SS	96.05	121.40	98.31	87.89	109.99	99.15	74.51	111.12	92.81
Sexual activities	M	17.39	15.82	16.60	17.10	16.74	16.92	17.08	15.18	16.13
	SD	2.26	2.24	2.25	2.24	2.29	2.26	2.27	2.28	2.26
	SS	107.45	93.51	100.44	104.88	101.68	103.28	104.70	87.83	96.27
Sexual health knowledge	M	37.84	39.15	38.39	37.1	38.99	38.05	36.88	38.17	37.52
	SD	2.48	2.49	2.47	2.48	2.49	2.47	2.48	2.48	2.47
	SS	97.08	107.69	101.53	91.09	106.39	98.78	89.31	99.75	94.49
Reproductive health knowledge	M	16.64	18.66	17.25	17.12	18.15	17.63	15.63	17.32	16.47
	SD	1.15	1.20	1.14	1.15	1.21	1.14	1.15	1.25	1.14
	SS	89.29	124.73	100	97.71	115.78	106.66	71.57	101.22	86.31
Nutrition	M	51.83	55.46	53.64	51.99	53.08	52.53	50.24	53.81	52.02
	SD	11.72	14.63	14.30	13.48	9.87	11.50	12.63	13.55	12.53
	SS	98.61	104.20	101.40	98.86	100.53	99.69	99.69	101.66	98.90



Characteristic Features of Reproductive Health Inventory in male and female students of CISCE, CBSE and WBCHSE Boards of education and Socio-Economic Status  
Necessary statistical treatments (Mean, Standard Deviation and Standard Scores) were calculated for Reproductive Health Inventory Scores for male and female students from three boards of education of studies and three socioeconomic status (upper, upper middle and lower middle).

In Table 9 The mean values reveal a moderate level of reproductive health status and subtle dissimilarities among the 6 groups of respondents.

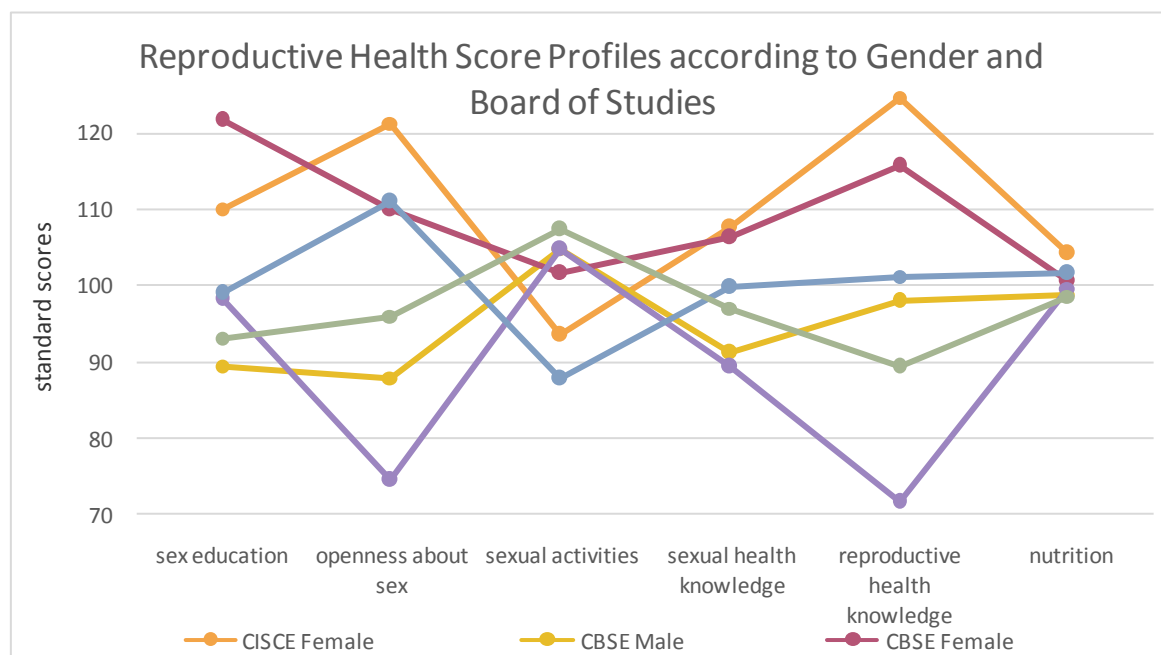


Fig 1 Reproductive Health score profiles according to sex and board of studies

Table 10: Characteristic features of Reproductive Health Scores from secondary students belonging to different Socio-Economic status

Component area of RHQ	Statistical measures	Upper (N=50)	Upper (N=50)	Middle	Lower (N=50)	Middle
Reproductive Health Score	M	154.51	145.58		139.12	
	SD	15.32	16.26		13.83	
	SS	108.56	95.88		86.70	
Sex education	M	7.55	7.47		5.84	
	SD	1.23	1.15		0.73	
	SS	92.22	90.74		60.57	
Openness about sex	M	15.73	14.85		14.10	
	SD	1.42	1.55		1.40	
	SS	115.06	102.67		92.11	
Sexual activities	M	17.55	15.37		15.44	
	SD	3.36	2.91		3.54	
	SS	104.44	85.08		85.70	
Sexual health knowledge	M	39.72	37.83		35.33	
	SD	2.22	3.31		2.24	
	SS	118.52	103.23		83.01	
Reproductive health knowledge	M	18.51	17.83		17.10	
	SD	1.45	1.53		1.72	
	SS	118.91	105.96		93.15	
Nutrition	M	55.45	52.23		51.31	
	SD	9.63	8.32		9.65	
	SS	102.63	97.70		96.29	

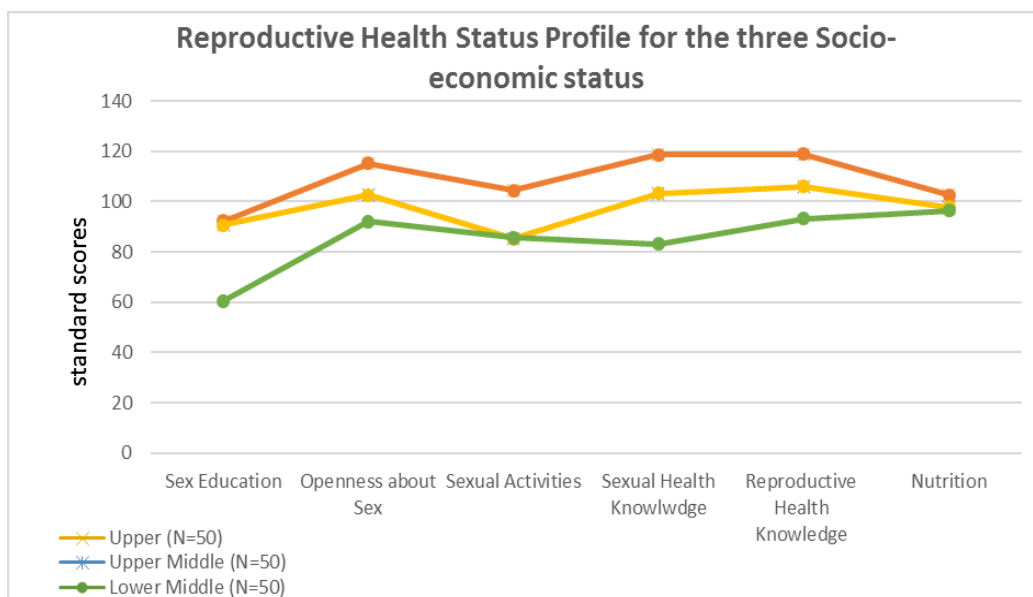


Fig 2 Reproductive Health Status Profile for the three Socio-economic status strata.

### Significant Difference between secondary school students in terms of Sex, Socio-Economic Status with respect to their reproductive health status for the verification of H1 and H2

**Table 11:** Mean(M), Standard Deviation(SD) and One-Way ANOVA Measures for Reproductive Health Profile and its Six Components of male and female students (N=600) for verification of H1.

VARIABLES	Mean, SD		Levene's Test of Equality of Error Variances	F Ratio for sources of Variation
	Male (N=300)	Female (N=300)		
Overall Reproductive Health Score	M <sub>M</sub> =143.50 SD=14.95	M <sub>F</sub> =151.50 SD=12.99	1.51	48.49**
Sex education	M <sub>M</sub> =7.03 SD=1.10	M <sub>F</sub> =8.48 SD=1.06	2.28	270.29**
Openness about sex	M <sub>M</sub> =14.18 SD=1.42	M <sub>F</sub> =16.17 SD=2.76	2.05	123.316**
Sexual activities	M <sub>M</sub> =17.19 SD=2.25	M <sub>F</sub> =15.91 SD=3.26	3.09	31.32**
Sexual Health Knowledge	M <sub>M</sub> =37.27 SD=2.47	M <sub>F</sub> =38.77 SD=3.47	5.43	37.20**
Reproductive Health Knowledge	M <sub>M</sub> =16.46 SD=2.14	M <sub>F</sub> =18.04 SD=2.01	4.53	86.88**
Nutrition	M <sub>M</sub> =51.35 SD=14.21	M <sub>F</sub> =54.11 SD=11.68	2.89	6.754*

\*indicates that the result is significant at 0.05 level \*\* Indicates that the result is significant at 0.01 level

Results of mean values highlighted that while the male students projected better knowledge and attitude in the area of *sexual activities* (M<sub>M</sub>=17.19) than females (M<sub>F</sub>=15.91). At the same time female students had stronger knowledge and attitudes in the areas of *sex education* (M<sub>M</sub>=7.03, M<sub>F</sub>=8.48); *sexual health knowledge* (M<sub>M</sub>=37.27, M<sub>F</sub>=38.77), *reproductive health knowledge* (M<sub>M</sub>=16.46, M<sub>F</sub>=18.04) and *openness about sex* (M<sub>M</sub>=14.18, M<sub>F</sub>=16.17) and *nutrition* (M<sub>M</sub>=51.35, M<sub>F</sub>=54.11) and in order to test for significance of such difference, data was

processed for F test. Significant F value indicated that there is significant difference in the overall nature of Reproductive Health Status of students (M<sub>M</sub>=143.50, M<sub>F</sub>=151.50, F=48.49) in terms of sex (male or female), including the components *sex education* (M<sub>M</sub>=7.03, M<sub>F</sub>=8.48, F=270.29), *openness about sex* (M<sub>M</sub>=14.18, M<sub>F</sub>=16.17, F=123.316), *sexual activities* (M<sub>M</sub>=17.19, M<sub>F</sub>=15.91, F=31.32); *sexual health knowledge* (M<sub>M</sub>=37.27, M<sub>F</sub>=38.77, F=37.20), *reproductive health knowledge* (M<sub>M</sub>=16.46, M<sub>F</sub>=18.04, F=86.88) and *Nutrition* (M<sub>M</sub>=51.35, M<sub>F</sub>=54.11, F=6.754)

indicated marked specificity between females and male students.

Hence Hypothesis H1, The nature of reproductive health status of secondary school students varies in terms of the sex (male and female) was accepted.

To maintain homogeneity of variance, 50 responses randomly chosen from each of the three strata of socioeconomic status were processed for ANOVA (Table 12). Most researches based on SES has revealed widespread disparities

in sexual and reproductive health in terms of their economic condition (Rani and Lule, 2004). In the present study, significant differences were found in the scores of overall reproductive health in terms of their socio-economic status levels (upper, upper middle and lower middle ( $M_1=154.51$ ,  $M_2=145.58$ ,  $M_3=139.12$ ,  $F=12.976$ ) indicating that the upper SES students had higher reproductive health status which was followed by upper middle class students and lower middle class students.

Table 12: Mean (M), Standard Deviation (SD) and ANOVA for Reproductive Health Profile in Terms of their Socio-economic status for verification of H2.

VARIABLES	Mean, SD			Levene's Test of Equality of Error Variance	F Ratio for sources of Variation	Mean difference (MD) between three groups in terms of boards of education and 't' value		
	Socio-Economic Status					Upper and Upper middle (t1)	Upper middle and Lower Middle (t2)	Upper and Lower Middle (t3)
	Upper (N=50)	Upper Middle (N=50)	Lower Middle (N=50)					
Reproductive Health Score	$M_1=154.51$ $SD=15.32$	$M_2=145.58$ $SD=16.26$	$M_3=139.12$ $SD=13.83$	1.23	12.976**	MD=-8.930 t=-2.826**	MD=-6.460 t=2.140*	MD=-15.390 t=-5.273**
Sex education	$M_1=7.55$ $SD=1.23$	$M_2=7.47$ $SD=1.15$	$M_3=5.84$ $SD=0.73$	3.62	41.470**	MD=-.080 t=-0.336	MD=-1.630 t=-8.462**	MD=1.710 t=8.454**
Openness about sex	$M_1=15.73$ $SD=1.42$	$M_2=14.85$ $SD=1.55$	$M_3=14.10$ $SD=1.40$	3.76	15.652**	MD=-0.880 t=-2.960**	MD=0.750 t=2.539*	MD=1.630 t=5.780**
Sexual activities	$M_1=17.55$ $SD=3.36$	$M_2=15.37$ $SD=2.91$	$M_3=15.44$ $SD=3.54$	3.18	7.130**	MD=-2.180 t=-3.46**	MD=-0.070 t=0.108	MD=-2.110 t=-3.057
Sexual Health Knowledge	$M_1=39.72$ $SD=2.22$	$M_2=37.83$ $SD=3.31$	$M_3=35.33$ $SD=2.24$	4.92	34.798**	MD=-1.890 t=-3.353**	MD=2.500 t=4.423**	MD=4.390 t=9.843**
Reproductive Health Knowledge	$M_1=18.51$ $SD=1.45$	$M_2=17.83$ $SD=1.53$	$M_3=17.10$ $SD=1.72$	4.49	10.077**	MD=-.680 t=-2.281*	MD=0.730 t=2.242*	MD=1.410 t=4.432**
Nutrition	$M_1=55.45$ $SD=9.63$	$M_2=52.23$ $SD=8.32$	$M_3=51.31$ $SD=9.65$	6.55	2.779	MD=-3.22 t=-1.789	MD=0.920 t=0.511	MD=4.140 t=2.147*

\*\* Indicates that the result is significant at 0.01 level \*indicates that the result is significant at 0.05 level

There is a bidirectionality of the relationship between SES and sexual health (Rao et al., 2008). Mean and F values indicated significant differences among the upper, upper middle and lower middle-class students in sex education ( $M_1=7.55$ ,  $M_2=7.47$ ,  $M_3=5.84$ ,  $F=41.470$ ), openness about sex ( $M_1=15.73$ ,  $M_2=14.85$ ,  $M_3=14.10$ ,  $F=15.652$ ), sexual activities ( $M_1=17.55$ ,  $M_2=15.37$ ,  $M_3=15.44$ ,  $F=7.130$ ), sexual health knowledge ( $M_1=39.72$ ,  $M_2=37.83$ ,  $M_3=35.33$ ,  $F=34.798$ ) and reproductive health knowledge ( $M_1=18.51$ ,  $M_2=17.83$ ,  $M_3=17.10$ ,  $F=10.077$ ).

This might be attributed to the differences in availability of supportive modern facilities like access to internet at home, magazines, better technological advances like latest mobile phones, tabs,

viewing pornographic materials, substance abusing and cigarette smoking etc. that are easily available to the students belonging to upper and upper middle status but which would not be probably easily accessed by the low middle-class families due to financial status. The low level of awareness of the students may be attributed to low academic background of their parents and to discuss the matter scientifically and frankly to their children.

Hence the second hypothesis that is, "Irrespective of sex (male and female), the nature of reproductive health status of secondary school students varies in terms of their socio-economic status (upper, upper middle, lower middle, upper lower and lower)." was accepted.

## DISCUSSION

The correlational results for validity measures, 'item total correlation' and 'item component correlation', indicated that the profile of Reproductive health of adolescents may be considered as a combination of six components namely 'Sex Education' that can create and support and enhance the knowledge base about functions and processes of the reproductive system, human processes like menstruation, masturbation, safe child bearing, abortion etc. it also includes the sources of such education like health counsellors, peers, mass media, internet etc.; 'Openness about Sex' that is the degree to which the adolescent can discuss about sexual actions and processes with others namely parents and peers; 'Sexual Activities' which include masturbation, sexual intercourse, intimacy, using protection while having sex etc.; 'Sexual Health Knowledge' that is awareness about safe sex practices, sexual hygiene, family planning methods, STIs etc.; 'Reproductive Health Knowledge' like desirable age of sexual initiation, concept of virginity, sexual coercion and other reproduction related knowledge and 'Nutrition' that is frequency of exercise or physical activity, opinion about having fast foods as against home cooked foods, obesity, knowledge about diet pattern during pregnancy, intake of adequate micronutrients etc. It implies that reproductive health status as reported by secondary school students were generating from their personal and situational factors.

The level of reproductive health profile along with its six components displayed uniqueness with respect to sex (male and female) and Socio-Economic Status (Upper class, Upper Middle and Lower Middle) of secondary school students.

With the background of moderate level of reproductive health status in secondary students, the nature of overall reproductive health status including its six components- Sex Education, Openness About Sex, Sexual Activities, Sexual Health

Knowledge, Reproductive Health Knowledge and Nutrition projected *marked specificity with respect to sex of students (male and female)*. While female students had displayed their superiority in strength of sex education, openness about sex, sexual health knowledge, reproductive health knowledge and nutrition status than that of the male students, at the same time male students had projected their better status in awareness of sexual activities than that of female students. The present observation corroborated with the findings of Drennan et al., (2009); Machale and Newell, (1997). The reason behind such findings could be explained in terms of the fact that girls in the Indian cultural context are biologically, socio-culturally and traditionally restricted to practice less sexual activities like sexual intimacy with partners, attain lesser stimulation through usage of pornographic materials, necking or kissing etc. However, they attained more knowledge on sex and reproduction than boys on account of more discussion with peers and parents, more usage of print information like magazines, internet etc.

The level of overall reproductive health status was relatively *better among the upper socio-economic status group students than that of the students of upper middle and lower socioeconomic status*. Such difference in the overall nature of reproductive health status among the three SES groups might be emerging from the social strata-wise uniqueness in differences in their methods of teaching and attitudes towards information seeking behaviour about sex, safe sex practices, the nature of inhibition in discussing sexual matters, affordability of nutritional intake etc. The findings corroborate with the findings that important interaction between economic opportunity and knowledge, attitudes and practices of the youth about reproductive health existed (Burt,2002). Higher SES indicated higher educational standard of parents and higher sex education in adolescents which was linked to decreased risk taking behaviour in adolescents

(Hayward et al., 1992). Socioeconomic differentials in adolescents' knowledge of safe sex might be attributed to reliance on forms of mass media that were less accessible to poor young adolescents (Raffaelli et al., 1993). However, results indicated no significant differences among the students of different socioeconomic status groups in the knowledge or attitude towards proper nutrition or behavioural practices. Research by O'Dea (1994) found similar results where no significant differences existed between sample from lower/middle or upper socioeconomic status in terms of their eating patterns. Weight control and body image were factors in determining eating habits parallelly in all the socioeconomic stratum (Freeman et al., 1995; De Spiegelaere et al., 1998). The results could also be explained in terms of the advise that adolescents received regarding diet patterns and practices from significant others around them and research has indicated that young people from middle/ upper or lower socioeconomic classes during mid-adolescent age were less likely to be advised about their eating habits no matter good or bad (Jennifer, O'Dea and Caputi, 2001).

The study highlighted that the socio-economic and educational inequalities at the family level of the students were related to unequal distribution of resources, health facilities, household, power and social status at societal, institutional and political level. These inequalities of the students influence who has power and control including in decision making surrounding sexual relations, choice of partner, norms of sexuality, availability and use of technical, medical and legal services. So, appropriate attention should be given to implementation of legal and regulatory framework which could establish guarantees for access to justice, transparent monitoring and services for all groups of student communities.

The student community has reported the current status of school based interventions through sex education were not always sufficient as such educational

programme often provided information only loaded with physical development and on hygiene in the name of sex education. Therefore, educational planner, curriculum developer and administrators should rethink about the issues of comprehensive education and information based curriculum content so that appropriate content of reproductive health should be incorporated in the curriculum and co-curriculum programme. In this regard, there should be more focus on comprehensive education and information with provision of accurate, and age- appropriate updated information on physical, psychological and social aspect of sexuality and reproductive health and ill health. So, there is a need for revision and updating of curriculum as per requirement of the students.

#### **Applied Values**

1. The present study had developed the database information that may be helpful to screen out the epidemiological status of reproductive health (nutrition and sexual components) related problems of the students and their management issues.
2. The study had revealed the data based facts of reproductive health status and related psychosocial factors of secondary school students which would be helpful for epidemiologists, educationists, intervention planners and others to frame strategies to plan and prioritize reproductive health related interventions and appropriate management strategies to promote the health and well-being of the students.

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