

Transitions in Adolescent Boys and Young Men's High-Risk Sexual Behaviour in India

Santosh Kumar Sharma (✉ santoshiips88@gmail.com)

International institute for Population sciences <https://orcid.org/0000-0002-7317-1973>

Deepanjali Vishwakarma

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Abstract

Background: The sexual behaviour of adolescents is of importance due to the engagement in risky sexual activity at a too early age, which may be associated with the adverse outcomes. The study aims to understand the transitions in adolescent boys and young men's high-risk sexual behaviour in India using two rounds of Indian demographic health survey, NFHS-3 (2005-06) and NFHS-4 (2015-16). **Methods:** A total of 25,538 in NFHS-3 (2005-06) and 35,112 in NFHS-4 (2015-16) men were considered for the analysis. Men have been divided into two age groups as 15-19 years (adolescent) and 20-24 (young men) for comparison purposes. Descriptive and multivariate statistics have been used. **Results:** Overall, high-risk sexual behaviour has increased among adolescent boys (64% to 70%) and young men (18% to 27%) from 2005-06 to 2015-16. The trend of live-in relationship has increased among adolescent boys of rural areas (0.6% to 6.0%) as well as in urban areas (3.1% to 10.9%) over the last ten years. Adolescent boys having 10 th and above years of schooling (AOR=1.98; $p<0.01$), residing in urban areas (AOR=2.23; $p<0.01$), and belonging to the affluent class of households (AOR=1.41; $p<0.05$) were more likely to engage in high-risk sexual activity than the young men in India. The odds of high-risk sexual behaviour was higher among alcohol-using adolescent boys (AOR= 1.82; $p<0.01$) and young men (AOR=2.38; $p<0.01$) in 2015-16. **Conclusions:** The study concludes that early sexual debut, lower prevalence of condom use at first sexual experience, tendency of live-in-relationship, and alcohol consumption indicate the hazardous interconnection between such behaviours among adolescent boys over the last decade which put them at higher-risky sexual behaviour as compared to young men. Adolescent' sexual behaviours have both short-term and long-term consequences, and interventions that focus on multiple domains of risk may be the most effective in helping to promote broad reproductive health among young adults.

Introduction

Adolescent in India comprises almost 22% of India's population and their number is only going to increase in future (Shashikumar et al. 2012; Srivastava 2016). They are growing up in an environment that is very different from their parents in which they grew up. The sexual behaviour of adolescents is of importance due to the increasing number of sexually active adolescents globally (WHO 2012; Pringle et al. 2017). While the initiation of sexual activity is a part of normal behaviour and development, it may also be associated with adverse outcomes, especially when sexual behaviour involves engagement in sexual activity at a too early age, or without due attention to the risks involved (Maswikwa et al. 2015). Adolescence is a period of transition when an individual's personality develops which includes his/her masculinity/femininity social, cultural, economic and biological events take place, which set the stage for adulthood (Srivastava 2016).

Indian society, which has traditionally been associated with sexual liberalism and open depictions of sexuality in the art form. Kamasutra, which originated before the sixth century, was the first text to consider sexual expression as a science (Joshi 2010). Despite even the ancient text of Indian theology recognizing the fundamental nature of adolescence and prescribing specific codes of conduct for the phase, the concept of adolescence is comparatively new in contemporary India, and it is the youth that has found space in policy formulations.

In contemporary India, age limits of adolescents have been fixed differently under different programs keeping in view the objectives of that policy or program- adolescents in the draft of youth policy has been defined as the age group 13-19 years; under the ICDS programme adolescents girls are considered to be between 11-18 years; the constitution of India and labour laws of the country consider people up to the age of 14 as children; whereas the Reproductive and Child Health program mentions adolescents as being between 10-19 years of age. The Juvenile

Justice (Care and Protection) Act (JJ Act) 2000 and now the JJ Act 2015, and the Protection of Children from Sexual Offences Act (POSCO Act), 2012 define all persons up to the age of 18 years as a child. Many other initiatives cover the large (10-24 years) age group as adolescents and youth (Thukral 2016).

Adolescent sexuality encompasses multiple factors such as developing intimate partner relationships, gender identity, sexual orientation, religion and culture (Tulloch and Kaufman 2013). Sexual behaviour perhaps influenced by many factors like physiological cultural and social pressures, which vary from generation to generation. (Pringle et al. 2017). Sexual exposure during adolescence is a matter of grave concern due to the risk of transmission of sexually transmitted infections, including HIV infection/AIDS, teenage pregnancy, and adolescent fatherhood (Ott 2010 and Auslander et al. 2007). In many developing countries, as well as underdeveloped countries, early sexual exposure leading to HIV infection is a matter of great concern (Kar et al. 2015). Joshi and Chauhan (2011) stated that there is a high level of premarital and unsafe sexual behaviour among youth in India. A study conducted by Sharma (2012) on adolescents and youth in low income slums of Mumbai articulated that the phase of adolescence is also marked by the experimentation and influence of friends and peer groups. During this stage of life, adolescents start spending more time outside the home, escaping the chaperon ship of the adult members of their families. Due to lack of knowledge on preventive measures and negotiating skills, adolescents and youth get easily influenced by mass media, friends and peer pressure leading them to experiment in risky lifestyles such as smoking, alcohol intake, drug consumption and sexual activity. As a result, the risk of sexually transmitted diseases (STDs), including HIV/AIDS, may be significant among adolescents and youths. Evidence from studies conducted in other countries suggests that condom use among youth in premarital sexual relationship is correlated with a number of individuals, partners, relationships, and family factors (Santhya et al. 2011; Meekers and Klein 2002; Lugoe et al. 1996). At the individual level, such factors as education, self-efficacy, perceptions about the benefits of condom use, perceived infection risk, household economic status and urban residence are positively associated with condom use, while early sexual initiation and substance use are negatively associated (Santhya et al. 2011; Juarez and Legrand 2005; Prata et al. 2006).

In view of the above, the study was undertaken to understand the transitions in adolescent boys and young men's high-risk sexual behaviour in India using the preceding two rounds of Indian demographic health survey, NFHS-3 (2005-06) and NFHS-4 (2015-16). The specific objectives of the study are to understand the changes in risky sexual behaviour and safe sexual practices at first and last sexual experience among adolescent boys and young men in India over the last decade, and to determine the factors associated with risky sexual behaviour among adolescent boys (15-19) and young men (20-24) in India.

Data And Methods

The analysis of this study is based on two rounds of National Family Health Survey (NFHS) survey, an Indian variant of Demographic and Health Surveys (DHS), conducted during 2005-06 and 2015-2016 which is available on the Demographic and Health Survey (DHS) website https://dhsprogram.com/data/dataset/India_Standard-DHS_2015.cfm?flag=1 and therefore, does not require any separate ethical approval. The National Family Health Surveys (NFHS) are part of the global Demographic and Health Surveys (DHS), conducted by the IIPS (Mumbai), with support from the Ministry of Health and Family Welfare (MoHFW), Government of India and ICF International Inc (IIPS & ICF 2017). NFHS is a nationally representative, large scale, repeated cross sectional survey in representative samples of households throughout India. NFHS provides important aspects of maternal, child, adolescent and adult health indicators. Details about the NFHS-3 and NFHS-4 sampling designs, tools, and

protocols presented in the national reports of NFHS (IIPS & ICF, 2017) and all relevant information is available in the public domain on <http://rchiips.org/NFHS.shtml>.

The NFHS survey collected information from a nationally representative sample of 74,369 in NFHS-3 (2005-06) and 112,122 men aged 15-54 years during the period NFHS-4 (2015-16). For the present study, only men aged 15-24 years have been considered. Therefore, a total of 25,538 men in NFHS-3 and 35,712 men aged 15-24 years in NFHS-4 were considered for the analysis. In this study, men have been divided into two age groups as 15-19 years (adolescent boys) and 20-24 years (young men) for comparison purpose.

Outcome Variables

The study used 'ever had sexual intercourse', 'age at first sex', 'condom use at first sex', 'multiple sexual partners in the past 12 months (having more than one partners)', 'relationship with most recent sexual partners', 'condom used with most recent sexual partners' and 'high-risk sexual behaviour in the past 12 months' as dependent variables. National Family Health Surveys has defined high-risk sexual behaviour as sexual intercourse, in the last 12 months, with someone who is neither a spouse nor a cohabiting partner (IIPS & ICF 2017).

Independent Variables

A set of independent variables such as socio-economic characteristics, demographic characteristics and geographical regions of the respondents were included in the analysis. The explanatory variables included in this study are years of schooling, place of residence (rural, urban), regular exposure of media (no, yes), household wealth index (poorest, poorer, middle, richer, richest), religion (Hindu, Muslims and others), membership to social group (Scheduled Castes – SC, Scheduled Tribes – ST, Others), region of residence (Southern, Northern, North-eastern, Central, Eastern and Western), comprehensive knowledge about HIV/AIDS (no, yes), and alcohol use (no, yes).

Statistical Analysis

Bivariate and multivariate analysis was applied to understand the changes in adolescent boys and young men's sexual behaviour during the last decade according to their socio-economic, demographic characteristics and region of residence. A Binary logistic regression was performed to identify the determinants of risky sexual behaviour among adolescent boys and young men.

Binary logistic regression analysis is useful when the outcome variable has only two categories (0 and 1). The basic form of logistic regression model, which yields the probability of occurring of an event, depicted as: (See Formula 1 in the Supplementary Files)

While analysing the association between multi-partner sexual behaviour and selected background characteristics, it was observed that the multi-partner sexual behaviour variable was excess with zero outcome. To overcome this problem we have used a zero inflated Poisson regression model to determine the incidence rate ratio (IRR) of having multiple sexual partners. The zero-inflated Poisson (ZIP) regression model is a modification of the familiar Poisson regression model that allows for an over-abundance of zero counts in the data. The distribution of multi-partner sexual behaviour variable combines the Poisson distribution and the logit distribution. For each observation in the multi-partner sexual behaviour, there are two possible regimes. In one regime the outcome is always a zero count, while in other regime the counts (including zeros) follow a standard Poisson process. Suppose that outcome one occurs with probability π and outcome two occurs with probability $1 - \pi$. Therefore, the probability distribution of the

ZIP random variable y_i (multi-partner sexual behaviour) can be written as (see Formulas 2 and 3 in the Supplementary Files)

Where the outcome variable y_i has any non-negative integer value, μ is the expected Poisson count for the i^{th} individual, and π_i is the logistic link function.

In the ZIP regression model, the predictors affecting π_i and μ_i may or may not be the same. If the same covariates affect π_i and μ_i , we can write π_i as a function of μ_i to obtain (See Formula 4 in the Supplementary Files)

Where B_j ($j=1, 2, 3, \dots, k$) is the regression coefficients unknown parameters that are estimated from a set of data.

Statistical analysis was carried out using STATA 13.0 version software. All the analyses were weighted using NFFHS-4 provided sampling weights to account for survey design.

Results

Table 1 shows the prevalence of ever had sexual intercourse among young men (15-24 years) during 2005-06 and 2015-16. Total 6,881 in 2005-06 and 7,851 adolescent boys and young men in 2015-16 ever had sexual intercourse. **Figure 1** shows that ever had sexual intercourse has substantially decreased among adolescent boys (11% to 8%) and young men (44% to 38%) during the last decade. Ever had sexual intercourse has decreased among uneducated young men from 48 percent to 36 percent during NFHS-3 to NFHS-4; however, it has slightly increased among higher educated men during the last decade. Although, ever had sexual intercourse is higher among young men residing in urban areas than the rural areas in both the consecutive survey, the prevalence of ever had sexual intercourse decreased from 32 percent in 2005-06 to 25 percent in 2015-16 among young men residing in urban areas (**Figure 3**). Around three-fifths of young men belonging to SC/ST had ever been sexually active during 2005-06, whereas this proportion decreased in 2015-16 (**Figure 2**). In case of socioeconomic status, as wealth index increases ever had sexual activity among adolescent boys and young men decreased in both the consecutive surveys (**Figure 1**). A Central region of India shows the highest proportions of adolescent boys and young men involved in sexual activity in both the consecutive surveys than the other geographic regions; however, the percentage has substantially declined in all the geographic areas in India during the last decade (**Figure 3**).

	NFHS-3 (2005-06)	NFHS-4 (2015-16)
No. of Women	6881	7851
%	26.9	22.4

Table 2 shows the transition of mean age at first sex and condom use at first sex among adolescent boys (15-19 years) and young men (20-24 years) in India over the last decade. Results show that the initiation of sexual activity is still early among adolescent boys (16 years) and young men (19 years) over the last decade. Condom use at first sex among adolescent boys (19% to 34%) and young men (14% to 26%) have considerably increased almost double from 2005-06 to 2015-16 respectively. Findings evident that condom use at first sex is higher among adolescent boys and young men residing in an urban setting, belonging to the other backward castes (OBC), and who have regular exposure to media than their counterparts in both the survey.

Adolescent boys and young men belonging to better-off households are more likely to use a condom at first sex in both the survey. Condom used at first sex has increased among adolescent boys (21% to 40%) and young men (16%

to 32%), even those who consumed alcohol during the last decade. Condom use at first sex among adolescent boys has rapidly increased during last ten years in the Eastern and Southern region, although other geographic region also showed the increased prevalence of condom use at first sex from NFHS-3 to NFHS-4.

Table 2: Mean age at first sex and condom use at first sex among adolescent boys and young men in India

Background Characteristic	NFHS-3 (2005-06)				NFHS-4 (2015-16)			
	15-19		20-24		15-19		20-24	
	Mean age at first sex (years)	Condom use at first sex (%)	Mean age at first sex (years)	Condom use at first sex (%)	Mean age at first sex (years)	Condom use at first sex (%)	Mean age at first sex (years)	Condom use at first sex (%)
Years of schooling								
No education	15.7	11.7	18.6	5.4	16.2	30.8	19.1	16.2
<5	15.9	9.9	19.1	9.5	16.1	34.0	19.1	15.2
5-9	15.7	19.5	19.0	13.8	15.9	30.4	19.3	20.2
10 and above	16.1	24.1	19.4	23.1	16.6	38.1	19.7	34.6
Place of residence								
Rural	15.6	13.8	18.8	10.5	16.2	30.5	19.4	21.0
Urban	16.1	34.0	19.4	23.5	16.5	43.6	19.6	37.5
Religion								
Hindu	15.7	16.6	19.1	13.4	16.2	31.4	19.4	26.6
Muslim	15.8	25.2	19.2	15.3	16.3	46.9	19.5	21.6
Others	16.3	34.1	18.8	23.2	16.6	45.1	19.5	30.2
Caste/tribe								
Scheduled caste	15.6	13.9	19.0	14.6	16.5	36.0	19.5	25.8
Scheduled tribe	16.1	13.7	18.6	7.0	16.2	25.5	19.1	16.0
Other backward class	15.8	14.9	19.0	11.1	16.1	30.8	19.4	25.9
Others	15.9	31.6	19.5	22.3	16.5	45.8	19.8	32.3
Regular exposure of media								
No	15.9	12.3	18.7	5.0	16.2	17.9	19.2	14.5
Yes	15.8	19.8	19.1	16.4	16.3	37.8	19.5	28.8
Wealth index								
Poorest	15.4	11.7	18.3	5.5	16.0	21.6	19.1	15.6
Poorer	15.6	12.2	18.8	8.8	16.2	29.8	19.3	20.0
Middle	15.8	14.1	19.0	13.8	16.2	30.0	19.5	25.4
Richer	15.9	26.7	19.3	18.7	16.5	44.1	19.7	30.9
Richest	16.3	41.6	19.7	30.7	16.7	56.0	19.9	42.6
Comprehensive knowledge about HIV/AIDS								
No	15.7	18.9	19.0	14.1	16.2	30.3	19.5	25.3
Yes	16.0	25.8	19.3	19.9	16.6	40.9	19.6	33.4
Alcohol Use								
No	15.7	17.1	19.2	13.0	17.1	31.9	13.0	23.8
Yes	16.0	21.4	18.9	15.9	21.4	39.8	15.9	31.6
Region								
North	15.9	29.2	18.9	1.6	16.6	36.0	19.6	28.6
Central	15.4	15.8	18.5	10.7	16.0	30.4	19.2	24.1
East	16.1	10.2	19.2	14.1	16.2	34.0	19.6	21.2
Northeast	16.2	21.0	18.9	11.6	16.4	16.2	19.4	15.2
West	15.7	31.5	19.8	23.6	16.4	38.8	19.4	37.3
South	16.4	18.5	19.7	12.0	16.7	46.5	20.5	19.1
Total	15.8	18.5	19.1	14.1	16.3	34.2	19.5	26.1

Multi-partner sexual behaviour

Table 3 shows the percentage distribution of adolescent boys and young men having multiple sexual partners in the last 12 months and the results of zero-inflated poisson regression of having multiple sexual partners in 2005-06 and 2015-16 in India. It is evident that multi-partner sexual behaviour among adolescent boys decreased (15% to 10%) during the last ten years. The prevalence of multiple sexual partner has declined during the last ten years among adolescents boys having 10th and above year of schooling (17.2% to 8.6%). In 2015-16, adolescent boys residing in rural setting (7%) are having more multiple sexual partners than the urban setting (11%). An estimated seven percent of adolescent boys belonging to other religion (Christian, Sikhs, Buddhism, Jain, etc.) reported multiple sexual partners in 2015-16 while in 2005-06, this proportion was almost four times higher.

The multi-partner sexual behaviour has also decreased among adolescent boys who have regular exposure of mass media 2005-06 (15%) to 2015-16 (10%). A rapid declining pattern was observed in the multiple sexual partner behaviour among adolescent boys belonging to the affluent class of households from 29 percent in 2005-06 to seven percent in 2015-16. Adolescent boys who have comprehensive knowledge of HIV/AIDS were more likely (IRR=1.67; p<0.01) to have more than one partner in 2005-06 whereas in 2015-16, they are less likely to report multiple sexual partners. Alcohol-using adolescent boys and young men are more likely to have more than one partner in both the survey, the rate of decrement is also observed over the last one decade.

Regional differences were also observed among adolescent boys and young men. In 2015-16, Central (12%), Eastern (11%) and Western (10.0%) region of adolescent boys shows the higher multi-partner sexual behaviour, whereas in NFHS-3, Northern (18%), Eastern (16%) and Western (24%) region of adolescent boys shows higher multi-partner behaviour than the other geographic regions of India. Zero-inflated Poisson regression results also revealed that adolescent boys belonging to Central (IRR= 1.77; p<0.01), and Western region (IRR=1.56; p<0.01) were more likely to have more than one partner in 2015-16 than the other counterparts.

Table 3: Percentage distribution of adolescent boys and young men having multiple sexual partners in the last 12 months and results of zero inflated poisson regression in India

	NFHS-3 (2005-06)				NFHS-4 (2015-16)			
	15-19		20-24		15-19		20-24	
Characteristic	Multiple partners	IRR(CI)						
Age								
15-19	8.4		3.7		2.4		6.0	
20-24	14.1	1.37(0.90,2.08)	7.7	1.03(0.88,1.20)	15.3	0.74(0.43,1.28)	5.1	1.14(0.95,1.36)
15-24	15.8	1.10(0.78,1.55)	5.3	0.82*** (0.72,0.92)	11.8	0.87(0.63,1.20)	5.3	1.04(0.91,1.18)
25-34	17.2	0.90(0.62,1.31)	5.6	0.58*** (0.50,0.66)	8.6	0.97(0.70,1.35)	6.4	0.72*** (0.63,0.82)
Marital status								
Married	13.0		5.2		11.1		5.4	
Unmarried	21.3	0.71*** (0.58,0.87)	5.5	0.74*** (0.68,0.81)	6.5	0.82** (0.69,0.97)	6.9	0.86*** (0.79,0.92)
Ethnicity								
Urban	15.0		5.0		10.3		5.7	
Rural	10.7	1.35** (1.04,1.75)	6.4	1.10* (0.98,1.24)	7.7	1.13 (0.89,1.42)	5.0	0.95(0.86,1.05)
Total	22.0	0.83(0.61,1.12)	8.4	1.03(0.90,1.16)	6.9	1.66*** (1.31,2.11)	10.5	1.04(0.93,1.16)
Religion								
Hindu	13.4		5.8		10.9		6.1	
Muslim	9.1	0.92(0.68,1.24)	3.3	1.03(0.90,1.18)	6.5	0.94(0.76,1.16)	5.0	1.002(0.91,1.10)
Christian	15.9	0.88(0.71,1.08)	5.2	0.94(0.85,1.03)	10.6	0.99(0.83,1.18)	6.7	0.96(0.89,1.04)
Other	19.2	0.70*** (0.55,0.89)	6.5	0.97(0.87,1.07)	10.4	0.72*** (0.58,0.90)	4.6	0.77*** (0.69,0.85)
Education								
Illiterate	14.1		3.6		7.0		5.2	
Literate	14.9	0.90(0.69,1.17)	5.8	0.92(0.82,1.03)	10.4	1.19* (0.97,1.46)	6.0	0.90** (0.83,0.99)
Health index								
Low	12.1		5.4		9.4		3.9	
High	13.0	0.99(0.75,1.31)	5.6	1.09(0.94,1.25)	10.0	0.81** (0.66,0.99)	7.1	1.03(0.93,1.13)
Total	10.1	0.69** (0.51,0.93)	6.0	0.98(0.85,1.14)	9.5	0.77** (0.62,0.97)	6.4	1.04(0.93,1.15)
Comprehensive knowledge about HIV/AIDS	17.3	0.90(0.66,1.22)	4.3	0.87* (0.75,1.02)	12.9	0.80* (0.63,1.02)	5.4	0.98(0.87,1.10)
Partial knowledge	29.1	0.80(0.57,1.12)	5.0	0.74*** (0.63,0.88)	7.0	0.75** (0.57,0.99)	6.3	1.003(0.88,1.14)
Contraceptive Use								
Never used	14.2		5.0		9.8		5.4	
Used	16.7	1.67*** (1.24,2.25)	6.4	0.97(0.90,1.05)	8.2	0.92(0.70,1.20)	8.2	1.06*(0.99,1.12)
Sexual Satisfactions								
Satisfied	10.3		2.6		8.4		4.5	
Not satisfied	23.8	3.61***	9.7	2.04***	13.1	2.30***	8.9	1.59***

		(2.67,4.87)		(1.89,2.19)		(1.64,3.23)		(1.50,1.70)
9)	17.6		4.9		6.9		5.4	
l	12.5	1.02(0.80,1.30)	7.4	1.07(0.96,1.20)	11.7	1.77*** (1.47,2.13)	7.3	1.17*** (1.08,1.27)
	16.2	0.52*** (0.37,0.73)	4.9	0.54*** (0.45,0.63)	10.5	0.87(0.68,1.10)	2.5	0.79*** (0.71,0.88)
ast	10.9	0.45*** (0.32,0.62)	4.0	0.58*** (0.50,0.66)	6.5	0.52*** (0.39,0.70)	3.0	0.65*** (0.57,0.74)
	24.5	0.56*** (0.41,0.76)	3.9	0.63*** (0.55,0.72)	10.0	1.56*** (1.22,1.99)	6.9	1.04(0.93,1.16)
	2.7	0.15*** (0.11,0.22)	3.4	0.43*** (0.38,0.48)	1.7	0.17*** (0.11,0.27)	7.0	0.42*** (0.36,0.48)
	14.8		5.3		9.8		5.9	

® Reference, *p<0.10; **p<0.05; ***p<0.01; IRR= Incidence rate ratio; CI (Confidence interval)

Relationship status with the most recent sexual partners

Table 4a portrays the status of relationship with the most recent partner among adolescent boys and young men according to their place of residence in 2005-06 and 2015-16 in India. Results show that relationship status with girlfriends/fiancé (57%), commercial sex workers (8.4%), and live-in partner (11%) is higher among adolescent boys residing in urban areas than the young men living in urban areas during 2015-16. It was observed that the percentage has increased in rural areas among adolescent boys having girlfriends/fiancé (29.6% to 48.6%), casual acquaintance (2.3% to 10.6%), commercial sex workers (2.3% to 5.5%) and live-in partner (0.6% to 6%) during the last one decade.

Relationships status with most recent sexual partners has also been analysed with the socioeconomic status of the adolescent boys and young men in both the survey (Table 4b). Adolescent boys belonging to the poorest quintile (41%) are more likely to have girlfriends/fiancé in 2015-16 than the adolescent boys in 2005-06. However, the culture of girlfriends/fiancé among adolescent boys have considerably increased in across the wealth quintile from 2005-06 to 2015-16. During the last ten years, live-in partner relationships have also increased among adolescent boys, whether they belong to lower socio-economic status of households (0.0% to 6.3%) or higher socioeconomic status (1.4% to 13%) from NFHS-3 to NFHS-4.

Table 4 (a): Relationships Status with the most recent partners among adolescent boys and young men in India

		Spouse	Girlfriend/fiancé	Casual acquaintance	Commercial sex workers	Live-in partner	Others	
NFHS-4 (2015-16)	15-19	Rural	28.7	48.6	10.6	5.5	6.0	0.6
		Urban	16.2	57.2	6.5	8.4	10.9	0.8
		Total	25.2	51.0	9.5	6.3	7.4	0.7
	20-24	Rural	77.9	15.2	2.4	1.8	2.4	0.3
		Urban	60.2	28.2	4.9	2.2	4.1	0.4
		Total	72.5	19.2	3.2	1.9	2.9	0.3
NFHS-3 (2005-06)	15-19	Rural	44.6	29.6	2.3	2.3	0.6	20.6
		Urban	15.0	54.9	3.1	8.9	3.1	15.1
		Total	38.2	35.0	2.5	3.7	1.2	19.4
	20-24	Rural	87.3	5.7	0.8	0.9	0.5	4.9
		Urban	75.3	12.7	0.5	3.3	0.9	7.4
		Total	84.2	7.5	0.7	1.5	0.6	5.5

Table (b): Relationship with most recent partner according to socioeconomic status among adolescent boys (15-19) in India

Socioeconomic Status	Spouse	Girlfriend/fiancé	Casual acquaintance	Commercial sex worker	Live-in partner	Others	
NFHS-4 (2015-16)	Poorest	32.4	41.2	11.1	7.8	6.3	1.2
	Poorer	28.8	44.7	12.8	8.0	5.7	0.0
	Middle	27.9	54.9	5.1	5.4	6.1	0.7
	Richer	18.4	61.3	7.9	3.8	7.1	1.5
	Richest	13.2	59.9	8.6	5.3	13.1	0.0
	Total	25.2	51.0	9.5	6.3	7.4	0.7
NFHS-3 (2005-06)	Poorest	45.0	32.2	1.6	1.9	0.0	19.3
	Poorer	50.0	24.0	1.7	1.8	1.8	20.8
	Middle	41.1	29.5	4.5	2.5	0.6	21.9
	Richer	24.4	46.4	1.6	9.4	2.3	15.9
	Richest	10.3	60.8	4.0	6.6	1.4	16.9
	Total	38.2	35.0	2.5	3.7	1.2	19.4

Condom use during last sexual intercourse

Overall, condom use during last sexual intercourse among adolescent boys (23% to 69%) and young men (13% to 65%) has rapidly increased over the last one decade (Table 5). It was observed that as the level of education increases, condom use during last sexual intercourse also increased among adolescent boys and young men in both the survey. The prevalence of condom use during last sexual intercourse increased among adolescent boys (37% to 72%) and young men (20% to 67%) from NFHS-3 to NFHS-4 those who have comprehensive knowledge of HIV/AIDS.

The results also reported that the prevalence of condom use during last sexual intercourse increased among alcohol-using adolescent boys and young men over the last one decade. Regional differences was also observed in the prevalence of condom use during last sexual intercourse in the last decade, as Southern region of adolescent boys and young men reporting higher prevalence than the other geographic regions of India in 2015-16. Condom use during last sexual intercourse in Central (20% & 12% to 66% & 58%), Eastern (14% & 7% to 66% & 65%) have rapidly increased among adolescent boys and young men from 2005-06 to 2015-16 respectively.

Table 5: Condom use at last sex with most recent partners among adolescent boys and young men in India

Background Characteristics	NFHS-3 (2005-06)		NFHS-4 (2015-16)	
	15-19	20-24	15-19	20-24
Years of schooling				
No education	12.0	5.8	46.8	68.3
<5 years	8.4	7.7	51.9	49.4
5-9	24.1	11.3	67.7	59.2
10 and above	33.4	23.8	72.0	68.0
Residence				
Rural	16.2	9.7	68.3	64.6
Urban	46.3	21.7	69.1	65.7
Religion				
Hindu	21.1	12.0	67.1	64.4
Muslim	27.0	12.9	71.9	66.0
Others	38.0	26.2	79.3	72.5
Caste/tribe				
Scheduled caste	18.8	12.4	77.1	72.1
Scheduled tribe	17.4	4.6	48.8	67.6
Other backward class	18.9	10.5	68.8	65.3
Others	39.3	21.0	63.7	61.1
Regular exposure of media				
No	11.5	5.1	62.5	38.1
Yes	25.2	14.8	69.2	67.7
Wealth index				
Poorest	11.5	3.7	62.8	62.5
Poorer	13.9	8.3	69.7	65.8
Middle	18.6	10.7	57.7	60.5
Richer	38.9	17.4	81.6	62.1
Richest	50.7	34.6	68.7	71.3
Comprehensive knowledge about HIV/AIDS				
No	21.8	11.5	66.4	64.3
Yes	36.5	19.6	72.2	67.1
Alcohol Use				
No	19.7	11.8	68.7	61.0
Yes	28.7	14.3	68.6	72.0
Region				
North	28.9	19.8	68.9	65.8
Central	19.9	12.4	66.3	57.6
East	14.2	6.9	66.3	64.7
Northeast	29.3	10.5	48.2	55.1
West	43.0	18.5	68.8	70.7
South	16.2	7.9	90.0	76.4
Total	22.7	12.8	68.8	65.1

High-risk sexual behaviour in the past 12 months

Table 6 estimated the high-risk sexual behaviour in the past 12 months among adolescent boys and young men in India. Overall, high-risk sexual behaviour has increased among adolescent boys (64% to 70%) and young men (18% to 27%) from 2005-06 to 2015-16. The odds of engaging in high-risk sexual behaviour in the past 12 months was higher among adolescent boys (AOR=1.98; p<0.01), and young men (AOR= 2.74; p<0.01), who are having 10th and above years of schooling than the other counterparts in 2015-16 (Table 7). High-risk sexual behaviour has decreased among adolescent boys residing in urban areas (85% to 74%) during the last decade, while it has

increased among young men from 26 percent in 2005-06 to 38 percent in 2015-16. The results of the binary logistic regression analysis revealed that adolescent boys and young men residing in the urban setting are significantly two times ($p<0.01$) and three times ($p<0.01$), more prone to engage in high-risk sexual behaviour in the past 12 months during 2015-16.

Analysis shows that as wealth index increases, high-risk sexual behaviour increased among adolescent boys and young men in both the surveys, although the magnitude of change has also been reported. The richest quintile of adolescent boys shows the declining trend from 90 percent in 2005-06 to 75 percent in 2015-16. The results depicted that adolescent boys and young men having comprehensive knowledge of HIV/AIDS are more involved in high-risk sexual behaviour in both the surveys. Multivariate analysis shows that alcohol-using adolescent boys (AOR=1.82; $p<0.01$) and young men (AOR=2.38; $p<0.01$) were significantly more likely to engage in high-risk sexual behaviour in 2015-16 than their counterparts.

It was observed that high-risk sexual behaviour among adolescent boys and young men belonging to Northern, Central, and Eastern region has substantially increased from 2005-06 to 2015-16, which was lower in 2005-06 than the other geographical regions of India. The results of the multivariate analysis also revealed that adolescent boys and young men belonging to the Central region are three times ($p<0.01$) and two times ($p<0.01$) more likely to engage in high-risk sexual behaviour in the past 12 months in 2015-16 (Table 7).

Table 6: High-risk sexual behaviour in the past 12 months among adolescent boys and young men in India

Background Characteristics	NFHS-3 (2005-06)		NFHS-4 (2015-16)	
	15-19	20-24	15-19	20-24
Years of schooling				
No education	43.3	11.6	59.1	16.1
<5 years	62.5	13.3	58.4	14.5
5-9	65.3	17.0	67.1	20.7
10 and above	75.4	27.8	74.2	36.8
Residence				
Rural	58.0	15.4	67.5	22.0
Urban	85.1	25.8	74.4	38.0
Religion				
Hindu	65.8	16.8	69.5	26.8
Muslim	46.6	20.3	68.2	21.0
Others	73.9	35.6	73.4	42.5
Caste/tribe				
Scheduled caste	69.6	18.0	76.0	76.0
Scheduled tribe	56.0	14.8	60.7	60.7
Other backward class	59.3	15.3	67.1	67.1
Others	75.1	25.0	79.8	79.8
Regular exposure of media				
No	41.4	9.7	49.0	14.1
Yes	69.0	20.3	74.2	30.0
Wealth index				
Poorest	57.4	13.6	63.3	15.8
Poorer	52.9	14.0	67.4	22.3
Middle	60.8	17.9	67.7	23.1
Richer	77.3	19.9	77.6	34.6
Richest	89.7	32.1	74.9	43.9
Comprehensive knowledge about HIV/AIDS				
No	62.3	18.0	71.8	25.4
Yes	75.3	23.5	71.2	35.1
Alcohol Use				
No	60.6	13.3	67.1	23.5
Yes	70.4	25.7	75.0	34.3
Region				
North	59.7	19.5	70.6	30.3
Central	67.2	19.6	81.5	32.6
East	46.7	13.2	58.5	12.7
Northeast	74.4	19.4	37.4	14.9
West	80.8	20.3	58.4	33.3
South	76.5	17.8	63.0	19.5
Total	63.8	18.1	69.5	26.9

Table 7: Factor Associated with high-risk sexual behaviour among adolescent boys and young men in India

Background Characteristics	NFHS-3 (2005-06)		NFHS-4 (2015-16)	
	Adjusted Odds Ratio (CI)		Adjusted Odds Ratio (CI)	
	15-19	20-24	15-19	20-24
Years of schooling				
No education®				
<5 years	1.63(0.64,4.13)	1.08(0.68,1.7)	4.57*(0.81,25.6)	0.95(0.58,1.56)
5-9	1.57(0.75,3.31)	1.38*(0.98,1.96)	1.20(0.55,2.6)	1.24(0.88,1.76)
10 and above	1.81(0.79,4.15)	2.22***(1.52,3.23)	1.98*(0.88,4.46)	2.74***(1.93,3.9)
Residence				
Rural®				
Urban	1.79**(1.06,3)	1.30**(1.05,1.61)	2.23***(1.33,3.75)	1.74***(1.47,2.06)
Religion				
Hindu®				
Muslim	0.57*(0.3,1.07)	1.53***(1.14,2.05)	1.04(0.54,2.01)	1.12(0.88,1.43)
Others	1.67(0.71,3.92)	1.90***(1.39,2.6)	2.05*(0.96,4.38)	2.10***(1.61,2.74)
Caste/tribe				
Scheduled caste ®				
Scheduled tribe	0.45**(0.21,0.94)	0.96(0.67,1.36)	0.87(0.48,1.57)	1.16(0.91,1.47)
Other backward class	0.49*** (0.29,0.83)	0.76** (0.58,0.98)	0.79(0.48,1.29)	1.03(0.85,1.24)
Others	0.68(0.36,1.31)	0.99(0.76,1.29)	1.68(0.84,3.38)	1.19(0.94,1.51)
Regular exposure of media				
No®				
Yes	1.26(0.71,2.23)	1.55**(1.1,2.19)	2.88***(1.78,4.66)	1.62***(1.29,2.04)
Wealth index				
Poorest®				
Poorer	1.41(0.78,2.54)	0.73(0.49,1.09)	1.29(0.75,2.23)	1.22(0.96,1.57)
Middle	1.07(0.57,2.01)	0.93(0.63,1.36)	0.82(0.45,1.49)	1.14(0.88,1.47)
Richer	2.29** (1.12,4.7)	0.86(0.58,1.29)	1.18(0.6,2.34)	1.32*(1,1.74)
Richest	2.82** (1.18,6.75)	1.34(0.87,2.06)	1.41** (0.62,3.2)	1.25*** (0.93,1.69)
Comprehensive knowledge about HIV/AIDS				
No®				
Yes	0.76(0.5,1.16)	0.76(0.5,1.16)	1.02(0.7,1.49)	1.30***(1.13,1.5)
Alcohol Use				
No®				
Yes	1.24(0.8,1.93)	2.26***(1.87,2.72)	1.82***(1.18,2.81)	2.38***(2.05, 2.77)
Region				
North®				
Central	1.90** (1.05,3.42)	1.14(0.84,1.53)	3.42***(1.99,5.88)	1.61***(1.33,1.94)
East	1.25(0.56,2.82)	0.64*(0.39,1.03)	0.80(0.43,1.47)	0.51***(0.39,0.67)
Northeast	1.39(0.62,3.16)	1.27(0.89,1.83)	0.60(0.26,1.39)	0.86(0.62,1.17)
West	2.91** (1.21,6.98)	1.25(0.9,1.74)	0.62(0.34,1.14)	1.31** (1.02,1.69)
South	3.57** (1.32,9.64)	0.87(0.62,1.23)	2.29(0.46,11.4)	0.60*** (0.42,0.85)
Constant	0.7771162	0.0884	0.5347918	0.0651916

® Reference, *p<0.10; **p<0.05; ***p<0.01; CI: Confidence intervals

Discussion

The present study attempted to assess the changes in sexual behaviour of adolescent boys and young men in India and associated factors using two rounds of NFHS survey. Adolescent sexuality has changed over the last five decades, with adolescents now reaching physical maturity earlier and marrying later. Many factors contribute to adolescents' reproductive health and behaviours. The socio-demographic factors such as place of residence, household wealth, and family composition provide the context for adolescent options and decisions; individual

characteristics such as educational attainment and current educational and employment status contribute to the human resources that define adolescents' present and shape their future (Rani and Lule 2004; Lloyd 2005; Blanc et al. 2009; and Guiella and Madise 2007).

The initiation of sexual activity is essential in the transition from adolescence to adulthood (Upchurch et al. 1998). The finding of the study revealed that initiation of sexual activity is still early among adolescent boys (16 years) and young men (19 years) over the last decade in India indicating that premarital sexual behaviour is common among men and seems to be growing liberalism about sexuality among the youth (Joshi 2010). This is similar to the findings from others studies conducted in various parts of India (Taraphdar et al. 2009; Maheshwari et al. 2017).

It was found that condom use at sexual debut increased the likelihood of condom use at most recent sex, and this effect was largely independent of the influence of stable demographic and personal characteristics and proximate attitudinal, behavioral, and relationship factors. This finding is consistent with the idea that early condom use could help establish a pattern of condom use that carries forward to subsequent sexual activity. (Shafii et al. 2004; Harrison et al. 2005).

Having multiple sexual partners is significantly associated with the risk of sexually transmitted infections (STIs) among adolescents (Vasilenko et al. 2014). Findings indicated that adolescent boys were having a higher number of partners than the young men in both the survey rounds, however, multi-partner sexual behaviour among adolescent boys decreased over the last decade. Several studies have also documented that adolescents are more likely to report having multiple sexual partners than adults (Forrest et al. 1990; Santelli et al. 1998 and Vasilenko et al. 2014). The major predictor of multiple sexual partners that emerged from the study was consuming alcohol. Alcohol using adolescent boys and young men were significantly more likely to have multiple sexual partners in both the surveys. It may be since adolescent boys and young men get easily influenced by mass media, friends and peer pressure, leading them to experiment in risky lifestyles such as smoking, alcohol intake, drug consumption and sexual activity (Sharma 2012).

In modern India, the live-in relationship is becoming more common among youngsters. With urban India becoming more open-minded and the obvious western influence and students moving out of their homes at an early age, live-in relationships have become even more prevalent (TOI 2017). Findings of the study also depicted that the percentage of adolescents having girlfriend, commercial sex workers, and live-in relationship has significantly increased in urban areas from NFHS-3 to NFHS-4. Results revealed that adolescent boys and young men residing in rural areas have also adopted the same culture during the last ten years. Social media may have played a significant role in this change of attitudes, what with the internet affording youngsters a level playing field with their metropolitan contemporaries as regards exposure. A visible consequence of this is the marked increase in the number of live-in relationships in small towns of India (Daily Mail 2013).

High-risk sexual behaviour puts people at risk for sexually transmitted infections (STIs), like HIV/AIDS, and being in a sexual relationship before being mature enough to know what makes a healthy relationship. The findings highlighted that adolescent boys who had had at least 10th and above years of education, residing in urban areas, and belonging to the affluent class of households were more likely to engage in high-risk sexual activity than the young men in India. Moreover, the prevalence of high-risk sexual behaviour has significantly increased among both adolescent boys and young men from NFHS-3 (2005-06) to NFHS-4 (2015-16).

Alcohol and sexual activity have a very close and robust relation (Ramadugu et al. 2011). Alcohol consumption has often been cited as increasing adolescents' risk of HIV infection (Diane et al., 2003). Consistent with the other

studies, which are robust in other countries concerning risky sexual behaviour and alcohol consumption (Demen et al. 1998 and Olley 2008). Findings of present study also confirmed a strong and significant relationship that alcohol using adolescent and young men is more likely to engage in high-risk sexual activity in both the consecutive surveys.

These observations indicate a need to focus awareness and educational efforts on a much younger age group of the adolescent in India. Early initiation of sex by adolescent boys and young men predicted a higher level of sexual activity (Brahme et al. 2010). It was also observed that the initiation of sex at a younger age was significantly associated with having more lifetime sexual partners and the choice of first sexual partner. The existing key interventions to sexual and reproductive health (SRH) of adolescents in India focused on the prevention of disease transmission and handling high-risk behaviours such as delaying sex debut, reducing the sexual relationship with multiple partners, and condom use (Vranda et al. 2018). Furthermore, research related to sexual and reproductive health has largely focused on girls and similar needs of adolescent boys have been neglected. Research, as well as programmes, should increase focus on young boys and men, not only to ensure equitable gender roles, attitudes, behaviours and outcomes but also because sexual and reproductive health is interdependent among both genders (Srivastava 2016).

According to a 2019 report compiled by the Family Planning Association (FPA), India, 21 per cent of Indian youth falls into the age group of between 10 to 19 years. Lack of comprehensive sexuality education, inaccessibility and lack of knowledge around contraceptives, erroneous sex-education due to early exposure to porn, etc., culminating in unhealthy sexual practices and reproductive ill-health are large issues that plague the youth. They also interfere with a meaningful development of an individual and society. Keeping in mind the changing dynamics of the society in India, the Government of India has brought out the National Education Policy, 2016, which accepts the significance of sex education in schools for adolescent for safety measures. It remains to be seen if this policy will be implemented this time over. It is about time that the educators realise that half-baked, incorrect knowledge about sex can be dangerous and it is better for the adolescent to be aware and prepared.

However, the reality is that sexuality education for adolescents is a highly controversial topic in India. It is seen as offensive to Indian values, and concerns that it might lead to risky sexual behaviour and promiscuity. As a consequence, young people in India do not have access to comprehensive sexuality education. Even among couples, discussions around sex and sexuality rarely happen, as it is taboo (Marlow et al. 2012). There are no specific educational curriculums for providing sexuality education to school-college going young people, and it's not even included within the counselling training curriculum. Laws protecting reproductive rights are not aligned and there is no specific law on sexual rights in India.

Conclusions

The study concludes that early sexual debut, lower prevalence of condom use at first sexual experience, and alcohol consumption indicate the dangerous interconnection between such behaviours among adolescent boys over the last decade. Therefore, there is an urgent need to adopt integrated approach of prevention strategies at various levels to generate awareness regarding the potential health hazards of alcohol and premarital sexual relationships that could target multiple forms of risky behaviours of adolescent boys. The concept of live-in relationship has also emerged among rural adolescent boys and young men, and not only among urban youth during the last ten years. The government of India should fix a legal age to be in a live-in relationship among young population. Emerging evidence shows that Indian demographic health survey should also conduct a special survey on adolescent sexual

and reproductive health, which will help in a better understanding of the nature of problems among adolescents in India, leading to their causes and solution.

Declarations

Ethics approval and consent to participate: Requisite permission in accessing and usage of dataset was obtained from the MEASURE-DHS archive.

Consent for publication: Not Applicable

Availability of data and materials: It is worth mentioning that the dataset is available in the public domain subject to a prescribed registration and approval process. Requisite permission in accessing and usage of dataset was obtained from the MEASURE-DHS archive.

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Figures

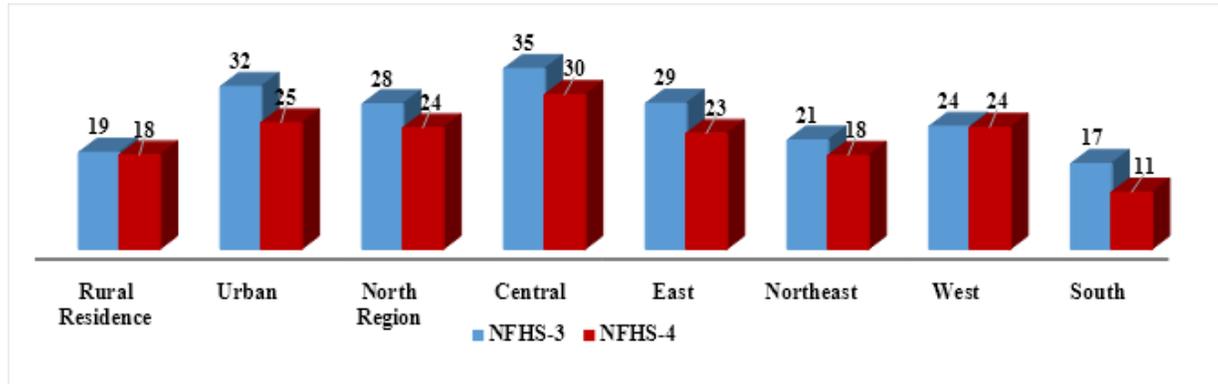


Figure 1

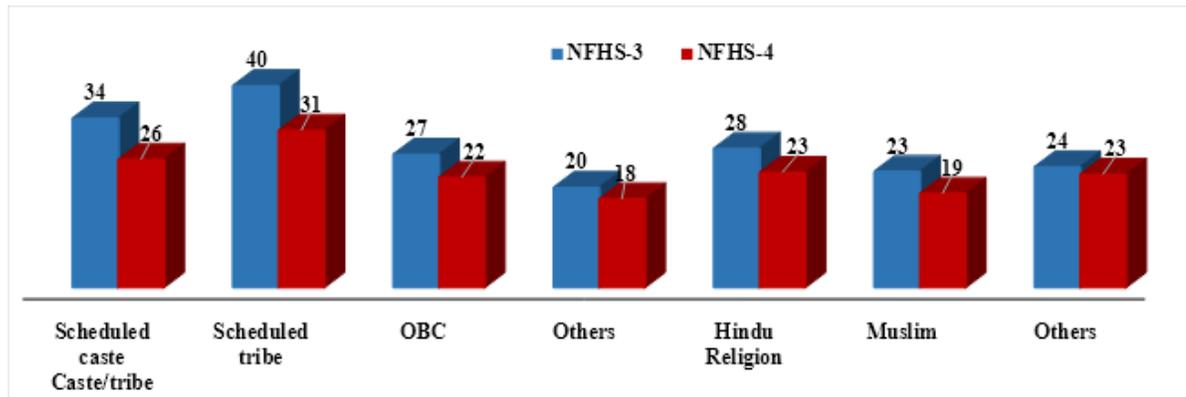


Figure 2

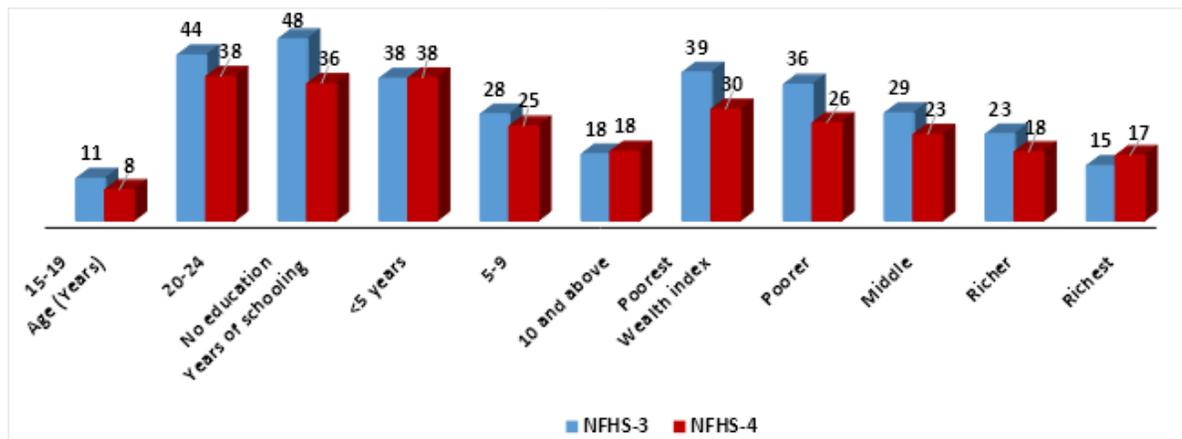


Figure 3

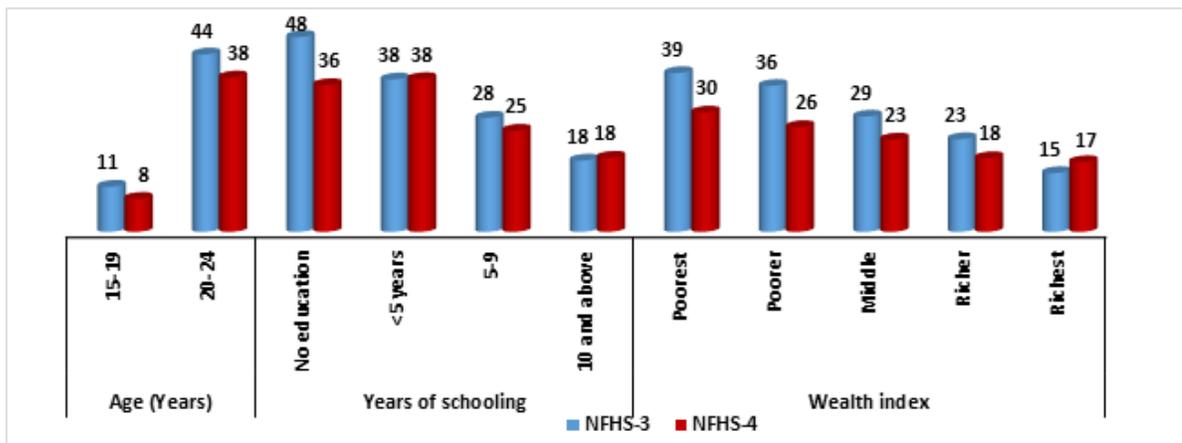


Figure 4

Prevalence of ever had sex among youth (15-24) according to age, education and wealth quintile.

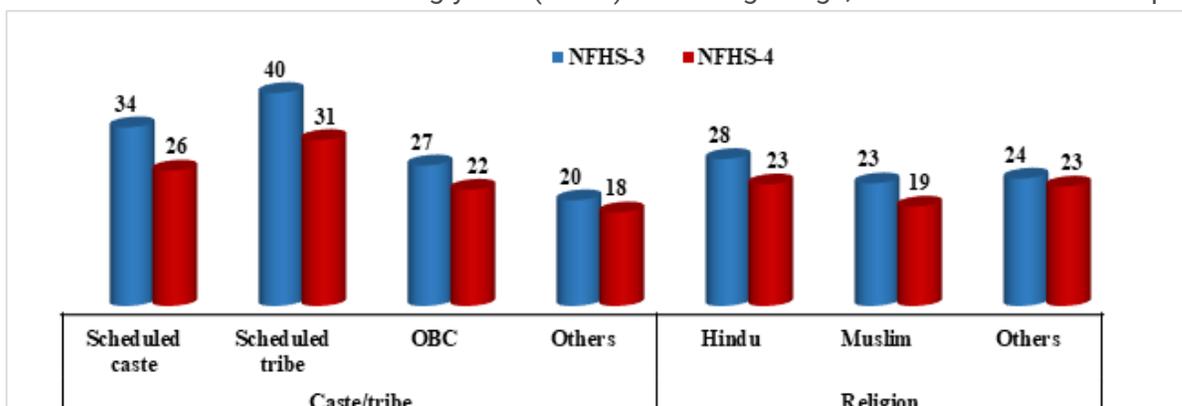


Figure 5

Prevalence of ever had sex among youth (15-24) according to social caste group and religion

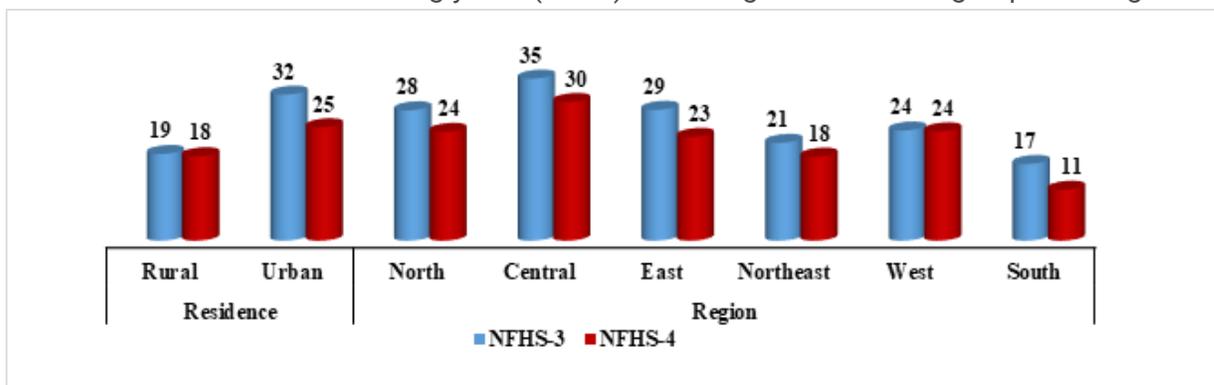


Figure 6

Prevalence of ever had sex among youth (15-24) according to Residence and geographic region

Supplementary Files

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