

Original Research Article

Exploring the patterns and socio-economic determinants of teenage pregnancy in India

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ABSTRACT

Background: Adolescent pregnancy is a significant public health issue in low- and middle-income (LMICs) countries, influenced by factors like early marriage, low education, rural residence, poverty, limited contraceptive use, and sociocultural norms. Therefore, this study aims to assess the patterns and socio-economic determinants of adolescent pregnancy in India.

Methods: The analysis draws on data from the fourth and fifth rounds of the national family health survey (NFHS), focusing on adolescent girls aged 15-19. Univariate, bivariate analysis and binary logistic regression were performed to assess patterns and socio-economic determinants of adolescent pregnancy.

Results: Results indicate a decline in adolescent pregnancy rates from 8.5% to 7.2% in the fourth and fifth rounds of NFHS. A higher rate of adolescent pregnancy was observed among not educated (21.4% to 19.2%), primary educated (15.6% to 13.4%), poorest (11.2% to 10.5%), and scheduled tribes (ST) (11.2% to 9.3%). Additional determinants included other religious, scheduled caste (SC), exposure to mass media, and family planning messages had the lower rate of adolescent pregnancies and women residing in eastern and northeastern regions had higher pregnancies. The logistic results also suggested that urban residence, higher level of education, working status, Christian faith, richest wealth status, and exposure to mass media had lower likelihood of adolescent pregnancies in India.

Conclusions: Findings suggest that while improvements in healthcare access and economic conditions have reduced adolescent pregnancy rates, persistent structural inequalities remain. Policy efforts must prioritize education, economic empowerment, rural health infrastructure, and youth-centered reproductive health services to achieve meaningful reductions in teenage pregnancies.

Keywords: Adolescent pregnancy; Social determinants, Economic determinants, India

INTRODUCTION

Pregnancy is one of the most critical stages in a woman's life cycle, and pregnant women have been widely recognized as a vulnerable group from a health and nutritional point of view. Most studies suggested that pregnancy outcomes are adversely associated with

maternal age.¹⁻³ The world health organisation (WHO) fact sheet 2024 reports that adolescents aged 15-19 in LMICs experienced 21 million pregnancies in 2019, nearly 50% of which were unintended, leading to about 12 million births. Of these, 55% ended in abortion, many of which were unsafe. Key factors include child marriage, limited reproductive autonomy, lack of education, and

poor employment opportunities.⁴ UNICEF's 2021 report estimated 650 million child brides globally, highlighting how early marriage increases the risk of early pregnancy, often in contexts where motherhood is socially valued over education or career aspirations. Early pregnancy is the most significant risk factor for pregnancy complications because this group is already suffering from health problems.^{1,5,6} According to the WHO Factsheet 2014, about 16 million girls aged 15-19 and two million girls under 15 give birth yearly. Globally, one in five girls becomes a mother by age 18. This number increases to over one in three in the world's poorest regions.⁷ Almost all adolescent births, about 95% in LMICs. Within the country, adolescent births are more likely to occur among poor, less educated, and rural populations. Since the mid-1990s, early pregnancy rates have declined in most developed countries; however, they remain higher in the United States. Further, the proportion of adolescent pregnancies ending in abortion varies widely across countries.⁸ South Asian countries have a direct association between maternal age at marriage and reproductive health outcomes. The rate of early pregnancy is high in these developing countries due to various factors, which are early marriage and childbearing, lack of safe abortion facilities, lack of power to defy unwanted sex, and lack of knowledge and access to contraceptives.^{3,8} Traditional practices and living conditions significantly influence adolescent pregnancy, which is more prevalent among women from lower socioeconomic backgrounds. Early marriage, often following menarche, is culturally favoured, leading to pregnancy before the age of 19 in many communities. Religious beliefs also shape marriage and childbearing practices. Education often takes a back seat, as poverty and societal pressure to marry force many girls to discontinue their studies.⁹

Early pregnancy is prevalent in developing countries like India, where many young girls are pressured into marriage without consent. Adolescents often face coercion into childbearing, abuse, and unsafe abortions, leading to unwanted pregnancies that harm their physical and mental health. These pregnancies also affect the socioeconomic well-being of families and society. Early marriage increases the risk to both the mother and fetus, resulting in significant costs to the mother, child, family, and society.¹⁰ Women who marry early are more vulnerable to poor pregnancy outcomes due to biological immaturity and incomplete physical growth.³

The WHO defines adolescence in girls ages 10 to 19 as a vital period of growth and development. Initiating pregnancy before completing the adolescent growth phase negatively impacts pregnancy outcomes.^{5,11} Adolescent mothers (aged 10-19 years) face higher risks of eclampsia, puerperal endometritis, and systemic infections than women aged 20-24 years, and babies of adolescent mothers face higher risks of low birth weight, pre-term birth, and severe neonatal condition.⁴ The risk associated with adolescent pregnancy is linked to

challenges such as school dropout rates and insufficient parental support. Education and family support influence parental decision-making to prevent adolescent pregnancy.^{12,13} Adolescent pregnancy rates are high in developing nations, often due to decisions regarding marriages made by parents or elders, sometimes without the girl's consent. Studies in South Asia have highlighted socioeconomic conditions, limited educational achievements, and specific cultural and family structures as consistent risks for adolescent pregnancy.^{10,14,15} Sociocultural, economic, individual, and health service-related factors influence adolescent pregnancies in Sub-Saharan Africa. Addressing this issue requires community awareness, comprehensive sexuality education, and ensuring girls remain in school. Additionally, adolescent-friendly health services and empowerment programs can positively impact pregnancy rates.¹⁶

Under the prohibition of child marriage act 2006, marriage before 18 years for girls and 21 years for boys is considered child marriage and a cognizable offence. Despite laws against child marriage in India since 1929, early marriages remain common. Abortion has been legal in India under specific conditions since the medical termination of pregnancy (MTP) Act of 1971. However, due to limitations, the law has had little impact on adolescents. As per section 3, sub-clause 4 of the MTP Act, minors require parental consent for an abortion. Early marriage leads to about half of young women being sexually active by 18, with one in five at 15. Only half a million adolescents access health services, reflecting risky maternal health-seeking behaviour among young mothers.^{12,13,17}

The study highlights that early marriage among women is linked to lower education, poor socioeconomic conditions, limited media exposure, and residence in underdeveloped regions. These factors reduce their autonomy, decision-making power, and workforce participation. Consequently, they face higher fertility rates, unplanned pregnancies, and reproductive health risks, increasing maternal mortality and financial burdens on households while negatively affecting their children's well-being.^{17,18} Healthcare facilities for adolescent women during pregnancy and delivery are notably deficient, given the heightened vulnerability of adolescent pregnancies to health complications for both mothers and fetuses. Despite a decline in adolescent fertility, the prevalence of adolescent pregnancy remains high, indicating a significant number of pregnancies ending in abortion or stillbirth.⁷

Adolescent pregnancy poses a significant challenge for families, societies, and nations, necessitating increased attention from researchers, government entities, and policymakers. The current study focuses on assessing the patterns of adolescent pregnancy across various states and exploring the socioeconomic and demographic determinants of adolescent pregnancy in India. Given this context, it is essential to delve deeper into the study to

examine the prevalence rate of adolescent pregnancy in India and investigate the socioeconomic and demographic determinants contributing to adolescent pregnancy. Through this comprehensive approach, the study aims to provide a deeper understanding of the multifaceted issues surrounding adolescent pregnancy and its broader implications on health and society.

METHODS

This study is cross-sectional study based on data from the fourth and fifth rounds of the NFHS, collected during 2015-16 and 2019-21 in India. The study is based on Indian teenage women aged 15-19 years, using data from the fourth and fifth rounds of the NFHS. Data collection was carried out between 2015-16 and 2019-21 across all states and districts of India. The sample selection for this study was based on the availability of NFHS data for teenage women aged 15-19 years. Since NFHS collects data on women aged 15-49 years, this study specifically focused on the teenage group (15-19 years) to assess the prevalence of pregnancies and identify the determinants of pregnancy within this selected group in India.

Data source

This research utilizes the fourth and fifth rounds of data from the NFHS focusing on adolescent girls aged 15-19. The fourth round of NFHS collected data from 699,686 women aged 15-49 across households in Indian states and UTs, with 121,552 adolescents aged 15-19. The fifth round of NFHS gathered data from 724,115 women aged 15-49, including 1,22,544 adolescents aged 15-19. The analysis presented in this study is limited to these adolescent girls. Additional details about NFHS are available, providing national and state-level data for India. The women's schedule is employed for the present study, with a sample size comprising 121,552 adolescent women from NFHS-4 and 1,22,544 adolescent women from NFHS-5. Information regarding adolescent pregnancy, encompassing live births, abortions, stillbirths, and miscarriages, is collected by questioning respondents about their pregnancy and childbirth experiences. The survey serves as a reliable source for estimating fertility, mortality, reproductive health, maternal and child health, nutrition, anaemia, and family planning services.

Dependent variable

Adolescent women who ever become pregnant

The outcome variable is a woman who has ever become pregnant before and at the survey date. This variable has been generated from the variables "women who are currently pregnant with first child," "total children ever born," and "Ever had a terminated pregnancy." The variable "total children ever born" is constructed as binary form; 0: no 1: yes, and the other two currently

pregnant and ever had terminated pregnancy are already available in dichotomous form; 0: no 1: yes.

Prevalence rate of adolescent pregnancy

The prevalence rate of adolescent pregnancy is computed on the given information NFHS-4 and NFHS-5 by asking respondents about pregnancy and birth questions. The numerator includes the total number of pregnancies (current pregnancy, live birth, stillbirth, abortion, miscarriage) among aged 15 to 19 years, and the denominator consists of the total number of women aged 15-19 years.

The pregnancy rate among adolescent women is shown in the number of pregnancies per ten thousand adolescent women.

Adolescent Pregnancy

$$= \frac{\text{Total number of pregnancies among 15 – 19 years}}{\text{Total number of women of 15 – 19 years}} \times 10,000$$

Independent variables

The present study has used several predictor variables, which are re-coded for the purpose of effective analysis and comparison of the result. The predictor variable is used to understand the linkage with the dependent variable. The predictor variables are the age group of women (15-19 in a single-year group, and other divisions of the group are 15-16, 17-18, and 19 years), religion (Hindu, Muslim, Christian, and others), caste SC, ST, other backward class (OBC) and others), education level of adolescent (No education, primary education, secondary education, and higher education), wealth quantile (poorest, poorer, middle, richer and richest), place of residence (urban and rural), region (North, Central, East, Northeast, West, and South), working status of the adolescent, media exposure (this variable has been generated for the variables "reading newspaper or magazine" "listening to radio" and "watching television" and it has been categorized as 0: Not exposed, 1: exposed), media exposure to family planning messages due to (not exposed and exposed). The outcome variable, "the total number of pregnancies" is taken as adolescent women who ever became pregnant in their life.

Ethics approval and consent to participate

Information from respondents is not collected as part of the study. Given that the study is a secondary data analysis based on NFHS data, consent to participate is not relevant.

Though the national nodal agency responsible for conducting the survey has sought IRB approval and individual consent to take the interview of all respondents.

Statistical analysis

Univariate and bivariate analyses were performed to determine the rate and distribution of adolescent pregnancies with the selected characteristics of women and binary logistic regression has been used to determine the potential determinants of adolescent pregnancy. The chi-square test is used to assess the independence of the variables associated with the factors, and the p value is used to see the significance of the results. Furthermore, multicollinearity was also checked by using variance inflation factors with an average value of 1.49, which suggests that the no multicollinearity present in the model.

A binary logistic regression model can be written in a compact form as follows:

$$\text{Logit}(pi) = \ln\left(\frac{pi}{1-pi}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k$$

Where β_0 is the intercept, $\beta_1, \beta_2, \dots, \beta_k$, are the regression coefficients indicating the relative effect of a particular explanatory variable on the outcome, $x_1, x_2, \dots, x_k$, are the control variables. The statistical package STATA version 16 was used for all statistical analyses. The proper individual-level sampling weights were used to make the results representative.

RESULTS

Socioeconomic and demographic characteristics of the adolescents in India from NFHS-4 (2015-16) to NFHS-5 (2019-21)

Table 1 depicts the socioeconomic and demographic characteristics of adolescent women in India. The result for the place of residence demonstrates that the rural adolescent population increased from 69.6% to 71.8% between the fourth and fifth rounds of NFHS, while the urban adolescent proportion experienced a slight decline between the fourth and fifth rounds of NFHS. Education levels of adolescents showed significant improvement during this period because the number of adolescents continuing to secondary education grew from 79.4% to 83.2%, while adolescent women without education declined from 6.8% to 4.4%. The proportion of adolescents not working grew from 82.1% to 85.9% simultaneously as the proportion of working adolescents declined. The religious and caste composition stayed consistent despite a minor increase in SC and ST adolescents. The wealth distribution statistics included a slight increase for the poorest and poorer categories, together with a corresponding decrease in the richest classification. Media exposure and media exposure by family planning messages experienced a slight decline, dropping from 84.5% to 80.3% and 62.8% to 62.6%, respectively. The rate of adolescent pregnancy has declined from 8.5% to 7.2% during the study period.

Prevalence of adolescent pregnancy in the states of India from NFHS-4 (2015-16) to NFHS-5 (2019-21)

Table 2 shows the rate of adolescent pregnancy in the states of India. The result shows a substantial decline in adolescent pregnancy occurrence in India, with decreasing from 8.5% to 7.2% across the country. West Bengal, while still having one of the highest adolescent pregnancy rates, saw a decline from 19.2-17%. Assam, together with Bihar, made progress against adolescent pregnancy while experiencing minor reductions from 14.2-12.3% and 12.9-11.6%, respectively. Telangana experienced a remarkable decrease in rates where adolescent pregnancy fell from 10.9% to 6.3%. The states like Jharkhand, Madhya Pradesh, and Karnataka experienced substantial reductions in rate of adolescent pregnancy over time. Jharkhand decreased from 13% to 10.3%, Madhya Pradesh reduced from 7.6% to 5.5%, and Karnataka dropped from 8.1% to 5.9%. On the other hand, Andhra Pradesh and Tamil Nadu experienced an increase in the rate of adolescent pregnancy, moving from 12.8% to 13.6% and from 5.3% to 6.7%, respectively.

Among smaller states, Tripura saw a significant increase in the rate of adolescent pregnancy, increasing from 19.7% to 22.9%, while Mizoram and Nagaland showed a declining rate as Mizoram from 7.4% to 4.1% and Nagaland decreased from 6.1% to 4%. The results for the union territories, Delhi demonstrated a slight increase in the rate of adolescent pregnancy from 2.8% and 3.8%, and Chandigarh achieved extraordinary progress by reducing its rate from 2.1% to 0.8%. Overall, the national trend points to a reduction in adolescent pregnancies, some regions still struggle to control growing adolescent pregnancies, according to the data, especially Andhra Pradesh and Tripura, which need special attention as new strategies are required to decrease this trend.

Prevalence of adolescent pregnancy by age at 15-19 years and socioeconomic and demographic characteristics as per NFHS-4 and NFHS-5

Table 3 shows the pattern of adolescent pregnancy among various demographic subgroups of women. The results suggest that all the characteristics of women were statistically significant. The level of education impacted on the prevalence of adolescent pregnancy. Women with no education had the highest prevalence of adolescent pregnancy despite a decline from 21.4-19.2%, followed by primary educated women declined from 15.6-13.4%, whereas higher educated adolescent women had seen a slight increase from 2.4-2.7%. Poorest, poorer, women not exposed to media and family planning messages had a higher prevalence of adolescent pregnancies with a history of higher prevalence with some decline in recent rounds of NFHS. ST women had a higher prevalence of adolescent pregnancies with a declining rate of 11.2-9.3%. A slight improvement in pregnancy rates existed among religious Hindus and Muslim populations, while other religions experienced a more substantial decrease.

The working and non-working adolescent groups showed moderate decreases in pregnancy rates, but the working group's results were not statistically significant based on result. The rate of adolescent pregnancy declined in urban areas from 5.4-4.2% and in rural areas from 9.8-8.4%. The prevalence of adolescent pregnancies remains higher in rural areas than urban areas. Pregnancy rates in Eastern (14.2-12.7%) and North-Eastern (13.3% and 12%) regions declined, yet these areas retained the highest prevalence of pregnancy. People who accessed family planning messages as well as were exposed to media experienced a decline in pregnancy rates. The number of adolescents exposed to media content decreased from 7.5% to 6.2%.

Adjusted odds ratio of socioeconomic and demographic determinants on adolescent pregnancy in India as per NFHS-4 and NFHS-5

Table 4 shows the predictors of adolescent pregnancies in India over time. All the covariates showed a statistically significant association with adolescent pregnancies in India. The analysis illustrates how adolescent pregnancy patterns have evolved between these times. Urban adolescents were still less likely (from 0.8 times to 0.64 times) to become pregnant than their rural counterparts. Education continues to be a powerful factor that decreases the likelihood of adolescent pregnancies. Adolescents with secondary (0.28 times and 0.38 times) and higher (0.08 times and 0.16 times) education were less likely to become pregnant over time. Employment status also plays a role, with working adolescents having a lower chance (0.61 times and 0.77 times) of pregnancy

compared to those not working. Muslim adolescents demonstrated a decreasing probability (0.78 times for pregnancy in NFHS-4 but achieved parity with other religious groups based on NFHS-5, and Christian adolescents maintained consistently lower pregnancy odds (from 0.47 times to 0.45 times). The odds of pregnancy among ST decreased over the NFHS-4 to NFHS-5 period, resulting in results comparable to those of other groups. Between NFHS-4 and NFHS-5, the probability of pregnancy experienced a decline among the OBC caste group. Economic status remains a key factor, with wealthier adolescents showing a reduced chance (0.63 times to 0.55 times) of pregnancy.

Regionally, the East (from 2.78 times to 2.46 times), Northeast (from 2.43 times to 2.19 times), West (from 2.12 times to 1.84 times), and South (from 2.38 times to 1.89 times) continue to have higher rates of adolescent pregnancy than the North, though these rates have slightly decreased in NFHS-5. The East (from 2.78 times to 2.46 times) region consisting of states like Bihar, Jharkhand, West Bengal, and Odisha remains the most affected region in India in terms of adolescent pregnancies. The findings of NFHS-5 demonstrate that media exposure reduces pregnancy occurrences during adolescence. The impact of exposure to family planning messages remained minimal for NFHS-4 and failed to demonstrate any statistical effect in NFHS-5 data. The latest survey indicates that education level, media exposure, and high household income were major factors in declining adolescent pregnancy rates, although family planning programs have not produced sustainable effects.

Table 1: Socioeconomic and demographic characteristics of the adolescents in India from NFHS-4 (2015-16) to NFHS-5 (2019-21).

Background characteristics	NFHS-4 (2015-16)		NFHS-5 (2019-21)	
	Weighted (%)	N	Weighted (%)	N
Place of residence				
Urban	30.4	36,932	28.2	34,543
Rural	69.6	84,620	71.8	88,000
Education level				
No education	6.8	8,311	4.4	5,335
Primary education	7.0	8,495	5.2	6,358
Secondary education	79.4	96,489	83.2	1,01,901
Higher education	6.8	8,257	7.3	8,950
Working status				
Not working	82.1	17,153	85.9	15,537
Working	17.9	3,730	14.1	2,555
Adolescent's religion				
Hindu	78.9	95,862	79.8	97,827
Muslim	16.4	19,918	15.8	19,410
Christian	2.0	2,391	2.0	2,475
Other religions	2.8	3,381	2.3	2,832
Adolescent's caste/tribe				
SC	22.1	25,911	24.1	28,204
ST	9.9	11,609	10.0	11,691
OBC	46.1	54,029	46.0	53,755
Non-SC/ST/OBC	21.9	25,656	19.8	23,168

Continued.

Background characteristics	NFHS-4 (2015-16)		NFHS-5 (2019-21)	
	Weighted (%)	N	Weighted (%)	N
Wealth index				
Poorest	20.8	25,257	22.5	27,513
Poorer	22.5	27,378	22.8	27,957
Middle	21.4	25,999	20.9	25,635
Richer	19.2	23,379	18.6	22,789
Richest	16.1	19,540	15.2	18,650
Regions				
North	13.3	16,117	14.0	17,195
Central	28.7	34,891	29.3	35,898
East	24.0	29,142	25.1	30,730
Northeast	3.3	4,049	3.5	4,264
West	13.1	15,876	12.1	14,782
South	17.7	21,477	16.1	19,674
Media exposure				
Not exposed	15.5	18,852	19.7	24,153
Exposed	84.5	1,02,700	80.3	98,391
Exposure of family planning messages				
Not exposed	37.3	45,281	37.4	45,805
Exposed	62.8	76,271	62.6	76,737
Total pregnancy				
Not pregnant	91.5	1,11,258	92.8	1,13,683
Pregnant	8.5	10,295	7.2	8,861
Total (n)	100.0	1,22,544	100.0	1,21,552

Table 2: State wise prevalence of adolescent pregnancy in India from NFHS-4 (2015-16) to NFHS-5 (2019-21).

India/states/union territories	NFHS-4 (2015-16)		NFHS-5 (2019-21)	
	%	N	%	N
Bigger states				
West Bengal	19.2	9,257	17.0	9556
Assam	14.2	2857	12.3	3108
Bihar	12.9	12370	11.6	14316
Jharkhand	13.0	3389	10.3	3449
Andhra Pradesh	12.8	3882	13.6	3562
Telangana	10.9	2901	6.3	2349
Maharashtra	9.0	10424	8.2	9390
Odisha	8.2	4126	8.0	3409
Karnataka	8.1	4933	5.9	5446
Madhya Pradesh	7.6	8100	5.5	7574
Rajasthan	7.0	7089	4.0	8440
Gujarat	7.0	5288	5.7	5200
Haryana	6.2	2437	4.3	2215
Tamil Nadu	5.3	6984	6.7	5764
Chhattisgarh	5.3	3080	3.3	3032
Uttar Pradesh	4.3	23711	3.2	25292
Kerala	3.1	2628	2.5	2428
Jammu and Kashmir	3.1	1137	-	-
Uttarakhand	3.1	1114	2.6	1021
Punjab	2.7	2045	3.7	2,175
Smaller states				
Tripura	19.7	329	22.9	317
Arunachal Pradesh	11.1	100	6.5	92
Meghalaya	8.9	306	7.3	337
Manipur	7.7	181	8.7	179
Mizoram	7.4	97	4.1	79
Nagaland	6.1	129	4.0	107
Goa	2.9	120	3.1	150
Sikkim	2.9	51	3.9	44
Himachal Pradesh	2.7	510	3.7	520

Continued.

India/states/union territories	NFHS-4 (2015-16)		NFHS-5 (2019-21)	
	%	N	%	N
Union territories				
Dadra and Nagar Haveli	11.0	30	5	42
Daman and Diu	4.5	13	5	42
Andaman and Nicobar Islands	4.7	35	3.0	23
Puducherry	3.5	109	4.2	95
Delhi	2.8	1704	3.8	1718
Chandigarh	2.1	81	0.8	99
Lakshadweep	0	5	1.1	7
Jammu and Kashmir	-	-	1	989
Ladakh	-	-	0	18
(χ^2 ; p value)	2500; <0.001		3000; <0.001	
Total (n)	8.5	1,21,552	7.2	1,22,544

Table 3: Prevalence of adolescent pregnancy by socioeconomic and demographic characteristics from NFHS-4 (2015-16) to NFHS-5 (2019-21).

Background characteristics	NFHS-4 (2015-16)		NFHS-5 (2019-21)	
	Prevalence of adolescent pregnancy age 15-19 years	Total no. of adolescent girls (N)	Prevalence of adolescent pregnancy age 15-19 years	Total no. of adolescent girls (N)
Place of residence				
Urban	5.4	36,932	4.2	34,543
Rural	9.8	84,620	8.4	88,000
(χ^2 , p value)	(477.0; <0.001)		(438.4; <0.001)	
Education status				
No education	21.4	8,311	19.2	5,335
Primary education	15.6	8,495	13.4	6,358
Secondary education	7.3	96,489	6.6	1,01,901
Higher education	2.4	8,257	2.7	8,950
(χ^2 , p value)	(3000; <0.001)		(1900; <0.001)	
Working status				
Not working	8.59	17,153	7.4	15,537
Working	6.74	3,730	6.5	2,555
(χ^2 , p value)	(3.8008; <0.051)		(0.0043; <0.948)	
Religions				
Hindu	8.4	95,862	7.0	97,827
Muslim	9.4	19,918	8.8	19,410
Christian	7.0	2,391	7.2	2,475
Other religions	7.6	3,381	4.5	2,832
(χ^2 , p value)	(26.0; <0.001)		(57.2; <0.001)	
Caste/tribe				
SC	9.4	25,911	7.8	28,204
ST	11.2	11,609	9.3	11,691
OBC	7.5	54,029	6.2	53,755
Others	7.5	25,656	6.3	23,168
(χ^2 , p value)	(165.5; <0.001)		(145.7; <0.001)	
Wealth index				
Poorest	11.2	25,257	10.5	27,513
Poorer	11.4	27,378	8.5	27,957
Middle	8.8	25,999	7.3	25,635
Richer	6.4	23,379	5.5	22,789
Richest	2.9	19,540	2.5	18,650
(χ^2 , p value)	(1200; <0.001)		(1000; <0.001)	
Regions				
North	5.2	16,117	3.7	17,195
Central	5.1	34,891	3.7	35,898
East	14.2	29,142	12.7	30,730
Northeast	13.3	4,049	12.0	4,264
West	8.3	15,876	7.3	14,782
South	7.7	21,477	7.2	19,674
(χ^2 , p value)	(1400; <0.001)		(1800; <0.001)	

Continued.

Background characteristics	NFHS-4 (2015-16)		NFHS-5 (2019-21)	
	Prevalence of adolescent pregnancy age 15-19 years	Total no. of adolescent girls (N)	Prevalence of adolescent pregnancy age 15-19 years	Total no. of adolescent girls (N)
Media exposure				
Not exposed	13.7	18852	11.6	24,153
Exposed	7.5	102701	6.2	98,391
(χ^2 , p value)	(1000; <0.001)		(773.2; <0.001)	
Exposure of family planning messages				
Not exposed	10.6	45,281	8.7	45,805
Exposed	7.2	76,271	6.4	76,736
(χ^2 , p value)	(339.2; <0.001)		(150.7; <0.001)	
Total (n)		1,21,552		1,22,544

Table 4: Socioeconomic and demographic determinants of adolescent pregnancy in India from NFHS-4 (2015-16) to NFHS-5 (2019-21).

Background characteristics	Adjusted odds ratio (95% CI)	
	NFHS-4 (2015-16)	NFHS-5 (2019-21)
Place of residence		
Rural		
Urban	0.80** [0.70,0.92]	0.64*** [0.53,0.76]
Level of education		
No education		
Primary education	0.77* [0.63,0.95]	0.70* [0.53,0.94]
Secondary education	0.28*** [0.24,0.33]	0.38*** [0.30,0.47]
Higher education	0.08*** [0.06,0.13]	0.16*** [0.10,0.25]
Working status		
Not working		
Working	0.61*** [0.53,0.71]	0.77** [0.64,0.93]
Religions		
Hindu		
Muslim	0.78** [0.67,0.92]	1.03 [0.87,1.24]
Christian	0.47** [0.30,0.75]	0.45** [0.25,0.81]
Other religions	1.89*** [1.42,2.53]	0.59 [0.35,1.01]
Caste/tribe		
SC		
ST	1.42*** [1.18,1.71]	1.04 [0.84,1.29]
OBC	1.08 [0.94,1.24]	0.84* [0.72,0.98]
Non-SC/ST/OBC	1.21* [1.02,1.43]	1.0 [0.82,1.22]
Wealth index		
Poorest		
Poorer	1.24** [1.06,1.46]	1.14 [0.97,1.35]
Middle	1.52*** [1.28,1.81]	1.0 [0.82,1.22]
Richer	1.01 [0.81,1.24]	0.87 [0.69,1.10]
Richest	0.63*** [0.48,0.83]	0.55*** [0.39,0.76]
Regions		
North		
Central	1.03 [0.82,1.29]	0.62*** [0.48,0.80]
East	2.78*** [2.26,3.43]	2.46*** [1.94,3.11]
Northeast	2.43*** [1.74,3.40]	2.19*** [1.46,3.27]
West	2.12*** [1.69,2.66]	1.84*** [1.41,2.41]
South	2.38*** [1.91,2.98]	1.89*** [1.45,2.45]
Media exposure		
Not exposed		
Exposed	0.85* [0.73,1.00]	0.74*** [0.62,0.87]
Exposure of family planning messages		
Not exposed		
Exposed	0.88* [0.78,0.99]	1.12 [0.98,1.29]

DISCUSSION

The results of the fourth and fifth rounds of data reveal important shifts in the socioeconomic, demographic, and healthcare-related factors influencing adolescent pregnancy in India. A clear trend is evident: overall, adolescent pregnancy rates have declined. Adolescent childbearing has significantly decreased over the years, falling from 16% in the third round of NFHS to 7.9% in the fourth round of NFHS and further reducing to 6.8% in the fifth round of NFHS. However, the steep reduction observed between 2005-06 and 2015-16 slowed somewhat during the period between the fourth and fifth rounds of NFHS.¹⁹⁻²¹ Socioeconomic and demographic factors play a role in influencing adolescent pregnancy, including belonging to marginalized communities often linked to low socioeconomic status, low education, place of residence, marital status, religious beliefs, financial constraints, and restricted employment prospects. It is also closely associated with poor access to health services, non-use of contraception, and early sexual activity.²²⁻²⁴ The improvements in education, wealth-based disparities, and rural-urban disparities have positively influenced these outcomes.²⁵⁻²⁷

The findings from the present study stated that urban adolescents consistently showed lower pregnancy rates than their rural counterparts. The results confirm that early marriages are common in rural areas. Rural adolescents are at a greater risk of pregnancies due to a lack of healthcare access and awareness.²⁶ Education emerged as a critical factor, with those having secondary or higher education significantly less likely to become pregnant. This study also supports the finding from a prior study that adolescent pregnancy should be addressed through education and support to encourage girls to delay motherhood until they are ready to have children. As a result of poverty, young girls are more likely to become pregnant, and they are then trapped in a vicious cycle because early motherhood may compromise their educational attainment and economic potential.^{27,28} While wealth-based differences have narrowed somewhat, adolescents from poorer backgrounds are still at a higher risk for pregnancy. The results indicate that adolescents in the poorest quintile are more likely to become pregnant early than their wealthier counterparts.²⁷

The study based on a global review of developing countries on adolescent childbearing also supports the present study's results that childbearing patterns vary significantly in many countries based on a woman's education level and place of residence. Overall, adolescent childbearing rates tend to be lower in urban areas and among women with higher education compared to and belong to the wealthier quintile than their poor, rural, and less-educated counterparts.^{11,12,29} A study previously conducted in Nepal showed that married adolescents are more likely to comply with social norms by becoming pregnant. Uneducated women and lower ethnic groups (Dalit/Madhesi) had higher pregnancy

risks, which is also observed in other developing countries. In addition, rural women marry earlier than urban women.³ Similarly, a study from India found that poor, illiterate young girls are getting married early and becoming pregnant before achieving their own growth potential.¹³ Employment status also plays a role, with working adolescents being less likely to become pregnant than those not working, which is also related to employment status, though this trend is less evident in NFHS-5. Evidence shows that work involvement may reduce the risk of early pregnancy.³⁰

The current research reveals that pregnancy rates among married adolescents continue to be high, showing a minimal increase between the fourth and fifth rounds of NFHS surveys (54.8% to 56.8%). Media exposure and media exposure through family planning information demonstrated positive effects in decreasing pregnancy rates. The present research shows that early marriage appears as the principal factor for adolescent pregnancy and motherhood. Educational attainment, along with age at first sex, household wealth, working status, family structure, contraceptive utilization, and exposure to media, proved to be significant contributors to adolescent pregnancy.^{27,30,31} Similarly, the study reports that South Asian societies view marriage as granting women a social license to start their reproductive stage by becoming pregnant shortly after marriage.^{14,2} Research has established that public health mass media allows adolescents to avoid early pregnancy while showing the same results in Bangladesh. Media exposure seems to improve knowledge sharing about family planning and adolescent pregnancy risk factors, which helps women make informed choices to decrease adolescent pregnancy rates.¹⁰ Another piece of evidence from the study in India stated that numerous women who got married at an early age showed minimal access to mass media information sources.¹⁷

Research findings of the present study indicate that caste and tribal communities have experienced shifts because Scheduled Tribes reported higher pregnancy occurrence in the fourth round of NFHS but demonstrated lower pregnancy likelihood in the fifth round. Another study of India confirms that caste-based disparities in health outcomes persist throughout India even though the nation has implemented numerous positive public policies for the betterment of underprivileged caste groups and tribes. The effect of caste on early childbearing remains poorly documented through empirical studies, particularly regarding the changing disparities between castes regarding this issue.³²

Adolescent pregnancy rates persist disproportionately between different regions as the East and Northeast experience higher numbers. Telangana and Jharkhand achieved notable progress regarding adolescent pregnancy rates, yet Andhra Pradesh and Tripura showed rising trends in this area. The numbers show that adolescent pregnancy rates from the fourth to the fifth

round of NFHS remain high in West Bengal, Assam, and Bihar despite their large state sizes. The present results align with the previous study, which reveals that the states of UP and Bihar show a high occurrence of adolescent pregnancy alongside teenage motherhood in addition to poor pregnancy results. Early pregnancy risk factors include child marriage, resulting in higher probabilities of complications before and during childbirth that cause miscarriage along with maternal and neonatal death. A combination of child marriage tradition along with health care inadequacy, poverty, and limited literacy levels functions as key drivers of adolescent pregnancies in India.³³

For strengthen the results, as per the United Nations report 2023, India has experienced a decrease in child marriage prevalence but remains responsible for one-third of global child brides, who include under 18-year-old girls and women married before adulthood. The state-by-state prevalence shows that in West Bengal, Bihar, and Tripura, 40% of marriages are before age 18, while Lakshadweep reports only 1% of young women. More than half of India's child brides are from Uttar Pradesh, Bihar, West Bengal, Maharashtra, and Madhya Pradesh, with Uttar Pradesh having the largest number. Rural, poor, and less-educated girls face a higher risk of early marriage.³⁴

Limitations

The research focused solely on adolescent girls aged 15-19 years, excluding other age groups that could have provided broader insights. The study relied entirely on secondary data from NFHS-4 and NFHS-5, analyzing information from a single time period without examining changes or trends over time. Key factors such as cultural beliefs, parental influence, personal aspirations, family background, and peer influence were omitted due to limited data availability. Regional variations and cultural influences on teenage pregnancy were likely underrepresented. Access to family planning services was not examined in detail. Additionally, some pregnancies and unrecorded abortions may have been missed, as pregnancy in India is often recognized only within marriage.

CONCLUSION

The research results prove that better health services for adolescent women with enhanced socioeconomic determinants led to decreased pregnancy rates. However, these improvements have not resolved all the challenges which persist among disadvantaged rural, teenagers and marginalized youth. Future policies need to improve educational and economic prospects for adolescent girls, enhance rural health service delivery, and implement youth-friendly family planning programs in high-burden regions. The complete elimination of adolescent pregnancy rates in India must happen through holistic action that resolves existing inequalities.

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