



Exploring the relationship between socioeconomic status and teenage pregnancy in India: a review on National Family Health Survey

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Abstract

Despite India's remarkable economic progress, teenage pregnancy continues to pose significant public health challenges, with adverse implications for both maternal and child health outcomes. Socioeconomic inequalities play a crucial role in shaping the landscape of teenage pregnancy, given India's diverse demographic and regional disparities in education, healthcare access, and women's empowerment. This study aims to address a notable gap in the existing literature by assessing the extent of inequality in teenage pregnancy in India, focusing on socioeconomic determinants often overlooked in previous research. The study employed a descriptive cross-sectional design, utilizing data from the third (NFHS-3 (2005–06)) and fifth (NFHS-5 (2019–21)) rounds of the Indian National Family Health Survey (NFHS). Concentration curves and decomposition methods were employed to analyze the data, allowing for an evaluation of the degree of inequality based on various socioeconomic and demographic characteristics of the sample. The analysis revealed significant disparities in adolescent pregnancy rates, particularly evident in rural-urban divides and disparities between socio-economic strata. Factors such as

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wealth quintiles, educational attainment, and exposure to mass media emerged as key contributors to the widening gap between disadvantaged and affluent populations. Our findings underscore the urgent need for a comprehensive policy approach to address the dual challenge of reducing teenage pregnancies and mitigating socioeconomic inequalities. Such an approach should incorporate cultural and health-promoting components to effectively tackle the underlying determinants of teenage pregnancy and promote equitable maternal and child health outcomes in India.

Keywords Teenage pregnancy · Socioeconomic inequities · National Family Health Survey · India

List of abbreviations

CC	Concentration curves
NFHS	National Family Health Survey
WHO	World Health Organization
SC	Scheduled caste
ST	Scheduled tribe
OBC	Other backward caste

Introduction

Teenage pregnancies continue to pose significant challenges in low- and middle-income countries, despite observed declines in total fertility rates (Mukhopadhyay et al. 2010; Wado et al. 2019). Globally, statistics reveal a troubling trend, with approximately 49 births per 1000 girls aged 15–19 occurring each year. This phenomenon is particularly pronounced in developing nations like Nepal, Bangladesh, and other South Asian countries, which collectively account for around 27% of total teenage pregnancies (WHO 2014). The gravity of this situation becomes apparent when considering that more than 70,000 teenage girls succumb to complications arising from early pregnancy and childbirth annually, a stark reality predominantly faced by young mothers in poorer countries (Mayor 2004).

Socioeconomic disparities play a pivotal role in exacerbating the prevalence of teenage pregnancies, especially among young women in South Asia. Research underscores the myriad risks associated with adolescent pregnancy, given the ongoing physical and psychological developmental processes during this critical life stage (Goonewardene and Deeyagaha Waduge 2005; Loaiza and Liang 2013; Talawar and Venkatesh 2013). Notably, young pregnant women face a twofold higher risk of mortality compared to their older counterparts, while early pregnancies can significantly disrupt their social integration and personal development.

While early marriage, often synonymous with early pregnancy and childbirth, is a cultural norm in certain communities, it is vital to recognize that teenage pregnancies can also occur outside the institution of marriage due to complex socioeconomic factors such as poverty, illiteracy, and limited access to contraception. Addressing these root causes separately is imperative to mitigate the prevalence of teenage pregnancies effectively. Equally crucial is ensuring that young people have

unfettered access to comprehensive sexual and reproductive health education and support systems, enabling them to make informed choices about their reproductive health and overall well-being.

Despite commendable strides in curbing teenage pregnancies, India continues to grapple with persistent socioeconomic and geographic disparities that underpin this phenomenon. Although recent data from the National Family Health Survey (NFHS) indicates a decline in teenage pregnancy rates from 16% to 7% between 2005–2006 and 2019–2021. However, these advancements are unevenly distributed across different demographic groups and regions (Bhan 2019; Deogaonkar 2004; IIPS and ICF 2021). Notably, the widespread practice of child marriage, a significant contributor to the incidence of teenage pregnancies in India.

Understanding the intricate web of socioeconomic disparities is paramount, particularly given India's diverse cultural landscape and significant regional variations in education, income, healthcare access, gender dynamics, and geographic factors (Deogaonkar 2004; Ghosh 2004; Sarkar and Mehta 2010; White et al. 2016). In this context, ongoing research endeavors that delve into the socioeconomic determinants of adolescent pregnancies and childbirth provide invaluable insights. By examining decomposition and concentration indices associated with adolescent pregnancies, researchers seek to delineate the socioeconomic drivers of inequity among adolescent mothers. This analytical approach sheds light on the nuanced interplay between regional socioeconomic disparities and teenage pregnancies, thereby contributing substantively to the existing body of knowledge on this critical public health issue.

Materials and methods

This study utilized secondary data from the third and fifth rounds of the National Family Health Survey (NFHS), conducted in 2005–2006 and 2019–2021, respectively in a repeated cross-sectional analysis. The NFHS is a nationally representative, population-based survey that covering all states and union territories of India (29 states and 7 UTs) and was undertaken by the Ministry of Health and Family Welfare, Government of India. The survey employed a two-stage stratified sampling design for sample selection. Both NFHS rounds provided information on maternal and child health, mortality, fertility preferences, nutrition, family planning, domestic violence, and women's empowerment. The NFHS implemented a two-stage sampling approach for rural areas and a three-stage sampling approach for urban areas. For rural areas, the NFHS implemented a two stage sampling approach, where villages were selected as Primary Sampling Units (PSUs) in the first stage, followed by households in the second stage. In urban areas, a three-stage sampling procedure was followed. In the first stage, wards were selected using probability proportional to size (PPS) sampling. In the next stage, a census enumeration block (CEB) was randomly chosen from each sampled ward. Households were randomly selected from each CEB in the final stage. The NFHS-3 covered a representative sample of 124,385 women aged 15–49 years, while NFHS-5 interviewed 724,115 women in the same age group. In the present study, data were restricted to all

women aged 15–19 years, leading to a final analytical sample of 23,955 and 122,480 women from NFHS-3 and NFHS-5, respectively (IIPS and ICF 2021).

Dependent variable

Teenage pregnancy was the primary outcome variable in this study. It is defined as a pregnancy occurring in women aged 15–19 years who have been pregnant or have given birth to at least one child. For analysis purposes, this variable is coded as “1” for women who are currently pregnant or have at least one child, and as “0” for those who have neither been pregnant nor given birth.

Independent variables

We selected the predictor variables based on a review of previous studies. The adopted predated variables included the following: age categories (15,16,17,18,19), early sexual debut (no, yes), knowledge of contraception (no, yes), wealth quintile (poorest, poor, middle, richer, richest), marital status (married, single), female education (no education, primary, secondary, higher), place of residence (urban, rural), gender of the head of household (male, female), religion (Hindu, Muslim, others), caste (Scheduled Caste [SC], Scheduled Tribes [ST], Other Backward Classes [OBC], others), mass media exposure (no exposure, irregular exposure, regular exposure), and region of India (north, central, east, west, south, northeast).

Statistical analysis

We conducted univariate analysis to summarize the characteristics of the respondents by calculating unweighted frequencies and weighted percentages. Additionally, we employed concentration curves and a concentration index to examine socioeconomic inequality related to teenage pregnancies and childbearing. The concentration curves were used to depict the distribution of these outcomes across the population, which was ranked from the poorest to the richest quintile, considering the various assets and durables possessed by households. The wealth index is considered a more reliable measure of socioeconomic status in developing countries than income (Wagstaff et al. 2007). The concentration index, which is twice the area between the concentration curve and the line of equality, is used to quantify the extent of socioeconomic inequality related to teenage pregnancy and childbearing. A positive index indicated that the selected characteristics were concentrated among the relatively wealthy, whereas a negative value indicated a concentration among the relatively poor. The index ranges from -1 to 1 , with a value of zero suggesting no inequality.

The mathematical form of the concentration index is as follows:

$$C = \frac{2}{\mu} \text{cov}(y_i, R),$$

where C is the concentration index, y_i is outcome variables, μ is mean, and R is fractional rank of the i th individual in terms of their socioeconomic index.

To further investigate the observed inequality, we decomposed the concentration index using a regression-based approach developed by Wagstaff et al., a method consistent with other studies that have explored inequality using the concentration index in India (Kakwani et al. 1997; Wagstaff et al. 2007). This decomposition allowed us to calculate the impact of various socioeconomic variables on the inequality observed in teenage pregnancy and childbearing. All statistical analyses were performed using Stata 16.

Results

Socioeconomic and demographic characteristics

Table 1 shows the distribution of adolescent pregnancies in the NFHS-3 and NFHS-5. The teenage pregnancy rate decreased significantly from 16% in the NFHS-3 to 7% in the NFHS-5. The proportion of women who reported early sexual debut decreased from 13% in 2004–2005 to 3% in 2019–2021. Similarly, The percentage of married women decreased from 30.5% in NFHS-3 to 16.4% in NFHS-5. The proportion of women with no education decreased from 21.7% in the NFHS-3 to 4.4% in the NFHS-5. Most women were from rural areas, with approximately 80% were Hindus. Furthermore, two-fifths of the women belonged to the Other Backward Class (OBC), and more than three-quarters of women were regularly exposed to media.

Prevalence of teenage pregnancy by socioeconomic characteristic

Table 2 presents the prevalence of teenage pregnancies from NFHS-3 to NFHS-5, disaggregated by socioeconomic status. The results showed a decline in the prevalence of teenage pregnancies among both poor and non-poor groups across both rounds. The most significant reduction in teenage pregnancies was observed in poor women aged 18–19 years. For instance, among poor women, the prevalence of teenage pregnancy decreased from 35% in 2005–2006 to 13% in 2019–2021 for this age group. Additionally, among poor women with an early sexual debut, the prevalence of teenage pregnancy decreased from 68% in 2005–2006 to 59% in 2019–2021. Poor women who reported knowledge of contraceptive methods exhibited a decline in teenage pregnancy rates from 25% in 2005–2006 to 9% in 2019–2021. Lastly, the prevalence of teenage pregnancies among poor women without any education decreased from 32% in 2005–2006 to 19% in 2019–2020; whereas for non-poor women, it decreased from 27% to 17%.

Inequality of teenage pregnancy and childbearing

The concentration Indices for teenage pregnancy in 2005–2006 and 2019–2021, presented in Table 3, demonstrate that the socioeconomic gap reduced over time as the Concentration Curves (CCs) moved closer to the line of equality (as shown in Fig. 1). Moreover, the decomposition results provided in Table 4 indicate that the contribution of early sexual debut to teenage pregnancy decreased from 37 to 12%

Table 1 Comparative Sample characteristics from NFHS-3 (2005–2006) and NFHS-5 (2019–2021), India

Variables	NFHS-3 (2005–2006)		NFHS-5 (2019–2021)	
	n (23,955)	%	n (122,480)	%
Teenage pregnancy and childbearing				
No	20,134	84.1	114,176	93.2
Yes	3821	16.0	8304	6.8
Age of the women				
Age 15	4648	19.4	24,686	20.2
Age 16	5057	21.1	24,576	20.1
Age 17	4635	19.4	23,648	19.3
Age 18	5413	22.6	26,661	21.8
Age 19	4203	17.6	22,909	18.7
Early sexual debut				
No	20,765	86.7	118,913	97.1
Yes	3190	13.3	3567	2.9
Knowledge of contraception				
No	1440	6.0	5751	4.7
Yes	22,515	94.0	116,729	95.3
Wealth status				
Poorest	4279	17.9	27,499	22.5
Poor	4896	20.4	27,942	22.8
Middle	5204	21.7	25,622	20.9
Richer	5002	20.9	22,777	18.6
Richest	4574	19.1	18,641	15.2
Marital status				
Ever married	16,662	69.6	106,227	86.7
Never married	7293	30.5	16,253	13.3
Women's education				
No education	5192	21.7	5332	4.4
Primary	3693	15.4	6355	5.2
Secondary	14,349	59.9	101,848	83.2
Higher	721	3.0	8946	7.3
Place of residence				
Urban	7205	30.1	34,525	28.2
Rural	16,750	69.9	87,955	71.8
Head of the household				
Male	20,852	87.1	102,860	84.0
Female	3103	13.0	19,618	16.0
Religion				
Hindu	18,831	78.6	97,776	79.8
Muslim	3858	16.1	19,400	15.8
Others	1266	5.3	5305	4.3
Caste				
Scheduled Castes (SCs)	4697	19.6	28,189	23.0
Scheduled Tribes (STs)	2044	8.5	11,685	9.5

Table 1 (continued)

Variables	NFHS-3 (2005–2006)		NFHS-5 (2019–2021)	
	n (23,955)	%	n (122,480)	%
Other Backward Class (OBC)	9674	40.4	53,727	43.9
Others	7540	31.5	28,880	23.6
Mass media exposure				
Not exposed	4222	17.6	24,141	19.7
Exposed	19,733	82.4	98,339	80.3
Region				
North	3125	13.1	17,186	14.0
Central	6450	26.9	35,879	29.3
East	5794	24.2	30,714	25.1
Northeast	903	3.8	4262	3.5
West	3273	13.7	14,774	12.1
South	4410	18.4	19,664	16.1

between 2005–2006 and 2019–2021. Conversely, wealth quintile and marital status have become increasingly significant contributors to teenage pregnancies. In 2019–2021, considerable inequality in teenage pregnancy rates was attributed to factors such as wealth, education, and exposure to mass media.

Discussion

This study utilized data from the National Family Health Survey (NFHS) to examine trends in teenage pregnancies in India over two periods, namely, 2005–2006 (NFHS-3) and 2019–2021 (NFHS-5). Our primary objective was to quantify the degree of socioeconomic inequality in relation to teenage pregnancies in India using decomposition techniques and concentration curves. To the best of our knowledge, our study is the first to investigate socioeconomic inequalities in teenage pregnancies in India by examining demographic and socioeconomic variables such as childbearing age, knowledge of contraceptive methods, marital status, education level, place of residence, religion, caste, and media exposure. By employing decomposition techniques and concentration curves, we demonstrated that socioeconomic disparities in teenage pregnancies declined over time, with the decreasing contribution of sexual debut, and increasing contribution of wealth quintile and marital status. Moreover, we found that wealth, education level, and mass media exposure were critical contributors to the significant inequality in teenage pregnancies in India in 2019–2021.

Our study highlights the need for targeted interventions to address socioeconomic determinants of teenage pregnancies in India. Previous research on teenage pregnancies in India has primarily focused on the health consequences for both mothers and children (Biswas et al. *n.d.*; Pratinidhi et al. 1990; Mahavarkar et al. 2008; Thekkekkara and Venu 2009; Mukhopadhyay et al. 2010; Sagili et al. 2012). These studies have revealed that teenage pregnancies often result in serious

Table 2 Prevalence of teenage pregnancy among poor and non-poor women by background characteristics based on NFHS-3 (2005–06) and NFHS-5 (2019–21), India

Variables	NFHS-3 (2005–2006)		NFHS-5 (2019–2021)	
	Poor	Non-poor	Poor	Non-poor
Age of the women				
Age 15	3.8	1.6	0.4	0.1
Age 16	10.5	3.7	1.5	0.8
Age 17	20.9	7.6	5.1	1.9
Age 18	34.7	17.2	13.5	6.5
Age 19	52.1	26.6	27.0	15.1
Early sexual debut				
No	10.6	6.6	6.6	4.1
Yes	67.3	69.1	59.5	56.7
Knowledge of contraception				
No	5.8	3.5	1.3	0.7
Yes	25.0	11.7	9.4	5.1
Marital status				
Ever married	0.1	0.0	0.0	0.0
Never married	52.9	51.7	52.2	49.2
Women's education				
No education	33.3	30.6	18.6	14.2
Primary	23.0	19.8	13.4	10.5
Secondary	12.6	8.2	7.8	4.9
Higher	0.0	2.1	2.4	2.6
Place of residence				
Urban	21.3	7.5	8.3	3.2
Rural	23.6	14.4	9.0	6.4
Head of the household				
Male	23.8	11.3	9.2	5.0
Female	21.3	11.2	8.1	4.8
Religion				
Hindu	23.7	11.6	8.4	4.9
Muslim	23.2	11.9	12.1	5.6
Others	18.2	6.2	9.4	3.7
Caste				
Scheduled Castes (SCs)	25.9	14.1	8.9	5.5
Scheduled Tribes (STs)	24.9	12.5	9.7	6.1
Other Backward Class (OBC)	21.9	12.4	7.1	4.8
Others	22.4	8.8	12.9	4.6
Mass media exposure				
Not exposed	30.4	27.3	11.8	7.1
Exposed	19.6	10.2	7.5	4.8
Region				
North	15.4	9.4	4.5	3.0
Central	18.9	9.7	3.9	2.7
East	30.7	15.2	14.0	8.3

Table 2 (continued)

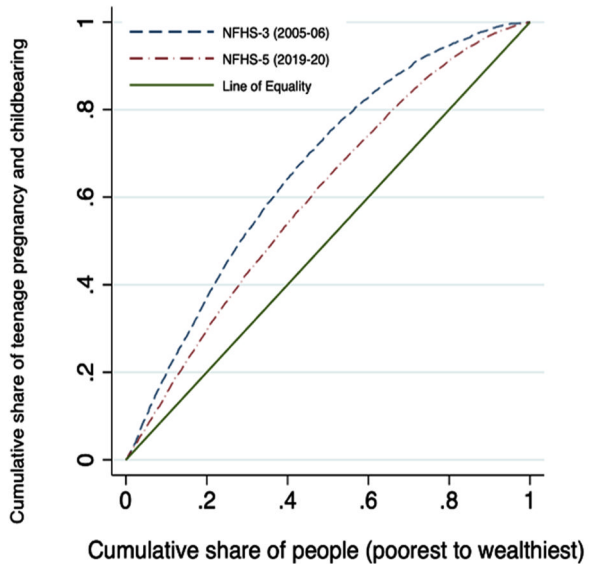
Variables	NFHS-3 (2005–2006)		NFHS-5 (2019–2021)	
	Poor	Non-poor	Poor	Non-poor
Northeast	23.3	9.9	13.7	6.0
West	23.3	10.6	9.4	5.7
South	20.2	12.1	7.9	6.3
Total	23.4	11.3	9.0	5.0

Table 3 Concentration Indices for teenage pregnancy and childbearing, NFHS-3 (2005–06) and NFHS (2019–21), India

	NFHS-3 (2005–2006)	NFHS-5 (2019–2021)
Concentration index	-0.25***	-0.21***
Std. error	0.01	0.01
N	23,955	122,480

Note *p*-values: ****p*<0.001; ***p*<0.01; **p*<0.05

Fig. 1 Concentration curve of teenage pregnancy, NFHS-3 (2005–2006) and NFHS (2019–2021), India



obstetrical and neonatal complications, a higher risk of anemia, and an increased propensity towards suicide.

Our study led to the following significant conclusions. First, teenage pregnancies between the ages of 18 and 19 years dramatically decreased among both poor and non-poor women. Second, a key factor in the reduced prevalence of teenage pregnancies is the knowledge of modern contraceptive methods. Third, the rate of teenage pregnancies varied significantly between urban and rural non-poor women. This can be attributed to a lack of education and limited access to sexual and

Table 4 Decomposition of the teenage pregnancy by background characteristics based on NFHS-3 (2005–2006) and NFHS-5 (2019–21), India

Variables	NFHS-3 (2005–2006)				NFHS-5 (2019–2021)			
	Elasticity	CI	Contribution	%	Elasticity	CI	Contribution	%
Age of the women								
Age 16	0.01	-0.02	0.00	0.04	0.00	-0.01	0.00	0.00
Age 17	0.04	0.03	0.00	-0.31	0.00	0.01	0.00	0.00
Age 18	0.12	-0.02	0.00	0.55	0.04	-0.01	0.00	0.14
Age 19	0.18	0.05	0.01	-2.78	0.17	0.05	0.01	-3.83
Early sexual debut								
Yes	0.25	-0.37	-0.09	28.52	0.08	-0.31	-0.03	11.97
Knowledge of contraception								
Yes	0.07	0.01	0.00	-0.12	0.05	0.00	0.00	-0.09
Wealth status								
Poor	0.00	-0.44	0.00	-0.67	-0.02	-0.32	0.01	-3.50
Middle	0.01	-0.02	0.00	-0.04	-0.01	0.11	0.00	0.52
Richer	0.01	0.41	0.00	0.31	-0.01	0.51	-0.01	2.51
Richest	0.01	0.81	0.00	2.23	-0.01	0.85	-0.01	2.89
Marital status								
Ever Married	0.67	-0.25	-0.17	66.82	0.88	-0.19	-0.16	77.57
Women’s education								
Primary	0.00	-0.26	0.00	-1.06	0.01	-0.39	0.00	1.28
Secondary	-0.02	0.20	0.00	3.56	0.08	0.02	0.00	-0.71
Higher	-0.02	0.62	-0.01	3.95	-0.03	0.36	-0.01	5.68
Place of residence								
Urban	0.01	0.47	0.00	-1.60	0.00	0.47	0.00	0.24
Head of the household								
Female	0.03	0.00	0.00	-0.04	0.07	0.01	0.00	-0.47
Religion								
Muslim	0.02	0.02	0.00	-0.12	0.02	0.03	0.00	-0.24
Others	0.00	0.24	0.00	-0.16	0.00	0.22	0.00	-0.38
Caste								
Scheduled Castes (SCs)	0.01	-0.41	0.00	0.63	0.00	-0.39	0.00	0.47
Other Backward Class (OBC)	-0.04	-0.02	0.00	-0.27	-0.02	0.04	0.00	0.43
Others	-0.02	0.23	0.00	1.49	0.02	0.19	0.00	-1.85
Mass media exposure								
Not exposed	-0.07	0.11	-0.01	0.16	-0.02	0.11	0.00	0.95
Region								
Central	0.01	-0.02	0.00	0.59	0.04	-0.10	0.00	2.04
East	0.00	0.28	0.00	1.49	0.08	-0.31	-0.02	11.50
Northeast	-0.03	0.02	0.00	0.04	0.01	-0.31	0.00	1.99
West	-0.08	-0.12	0.01	-1.76	0.01	0.24	0.00	-1.66
South	0.00	0.15	0.00	-1.49	0.06	0.28	0.02	-7.43

reproductive health services in rural areas (Kassa et al. 2018). Fourth, the concentration curve demonstrates a divergence in teenage pregnancy rates between the poor and non-poor, which could result in socioeconomic inequality. Fifth, the decomposition analysis identifies variables, such as wealth quantiles, better educational attainment, and media exposure that contribute to the widening gap between the poor and non-poor. Comprehensive research explains the factors that lead to the general decline in teenage pregnancies in India and examines socioeconomic disparities.

Given that this was an innovative study that controlled socioeconomic variables, it examined the decomposition and concentration indices of the prevalence of adolescent pregnancies. Only a few studies from other countries contend that education, wealth, and teenage sexual preference are significant predictors of teenage pregnancy (van der Klis et al. 2002; Webb et al. 2011; Espinel-Flores et al. 2020b; Baxter et al. 2021). Our study, similar to earlier ones, demonstrated socioeconomic inequalities and that adolescent pregnancy increased significantly among those with a lesser education level (Webb et al. 2011; Espinel-Flores et al. 2020). According to Espinel-Flores et al. (2020), reducing teenage motherhood may be feasible with the help of gender equality, access to comprehensive education, contraception, health care, and safe abortion (Espinel-Flores et al. 2020). According to Baxter et al. (2021), the high prevalence of teenage pregnancies poses negative health risks to mothers and new-borns in high-income countries and eventually results in socioeconomic inequality (Baxter et al. 2021). These writers further contend that in the case of England, the strategy to lower teenage pregnancy rates is ineffective. According to Webb et al. (2011), adolescent motherhood is comparatively more susceptible to mortality risk, which results in health disparities in the sample population of the United Kingdom (Webb et al. 2011). In comparison to parenting at a more advanced age, researchers have discovered that teenage moms had more than twice the risk of suicide and fatal cervical and lung cancer. Therefore, physicians, professionals in public health, social services, and decision-makers should prioritize addressing the psychosocial needs of teenage mothers (van der Klis et al. 2002). In the sample of South Africa and Australia, studies have discovered sociodemographic disparities in the rate of teenage pregnancies. They claim that, although exceptional, teenage pregnancies in South Africa have decreased over the past century because of the high socioeconomic characteristics of the population, which further results in the largest percentage of teenage pregnancies being terminated. A few studies have suggested that midwives can aid health promotion initiatives to reduce socioeconomic disparities in teenage pregnancies (Beldon and Crozier 2005; Yakubu and Salisu 2018).

Sustainable development objectives prioritize the elimination of inequities in mother and child health from a policy perspective. However, the progress in India has been inconsistent. Similarly, the most recent Lancet study contends that, in India, the first teenage pregnancy during adolescence has been linked to greater levels of child undernutrition than the first pregnancy after puberty. They discovered that poor socioeconomic status, such as inadequate social and health rights in society and poor use of contraception, made adolescent mothers more vulnerable. Overall, we have seen that reducing teenage

pregnancies and social inequalities seldom requires a multifaceted approach to policymaking that must be supplemented by cultural and health promotion factors.

To alleviate the global burden of child marriage and teenage pregnancy, with a particular focus on India, it is crucial to address the challenges posed by pregnancy and childbearing among adolescents. These situations significantly increase the risk of maternal mortality and morbidity. Furthermore, babies born to adolescent mothers have elevated prospects for premature birth and low birth weight. Within Latin American countries, a striking trend has emerged, as they exhibit the second-highest rates of adolescent fertility worldwide. Notably, estimates indicate that between 2010 and 2015, approximately 67 out of every 1000 girls aged 15–19 gave birth in this region (Caffe et al. 2017). The situation in other developing nations, including Costa Rica, Brazil, Ecuador, Mexico, Panama, and Uruguay, also highlight a notable concern. These countries are grappling with a disproportionately high percentage of adolescent mothers, particularly within indigenous and rural populations.

This study has certain limitations. First, it is worth noting that our dataset is over five years old and may not accurately reflect the current state of teenage pregnancy in India. Second, our analysis does not account for supply side factors, such as the availability of services at government health facilities, which can potentially impede access to postpartum care. Third, the absence of alternative methods to assess the decomposition and concentration indices for robustness could be considered a limitation, even though supporting evidence does not exist in the literature at present. Despite these limitations, our study has significant policy implications, shedding light on pregnancy characteristics and women's choices regarding access to women's healthcare facilities in India.

Conclusions

Based on the study's findings regarding teenage pregnancies in India, several conclusions can be drawn. Firstly, while there has been a gradual decline in teenage pregnancy rates over time, significant challenges persist, particularly in rural areas. This highlights the ongoing need for targeted interventions and sustained attention to comprehensively address the issue of teenage pregnancies across all regions.

Secondly, socioeconomic disparities play a crucial role in teenage pregnancies, with factors such as wealth, education level, and media exposure significantly contributing to these disparities. Addressing these socioeconomic determinants is essential in effectively tackling teenage pregnancies and reducing inequalities.

Furthermore, the study underscores the importance of tailored interventions to address the specific challenges faced by different population groups, particularly rural non-poor women who face higher rates of teenage pregnancies due to limited access to education and reproductive health services. In terms of policy implications, the study emphasizes the urgent need for comprehensive reproductive health education among teenagers, ensuring access to educational opportunities, and promoting employment opportunities for women. Additionally, empowering

youth, promoting gender equality, and ensuring access to sexual and reproductive health rights education are essential components of effective intervention strategies.

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Author contributions M.D.: Conceptualization; Formal analysis; Investigation; Methodology; Supervision; Writing—original draft; Writing—review and editing. A.A.: Conceptualization; Writing—review and editing. P.B.: Writing—original draft; Writing—review and editing. D.K.B.: Writing—original draft; Writing—review and editing. All authors read and approved the final version of manuscript.

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Data availability The data set used in this study available in the public domain https://dhsprogram.com/data/dataset/India_Standard-DHS_2020.cfm?flag=1.

Declarations

Ethical approval This study utilized the NFHS-3 and NFHS-5, publicly available datasets with no identifiable information on the survey participants. These datasets can be downloaded from the Demographic and Health Surveys website. Ethical approval for the original study was obtained from the IIPS Ethical Review Board. Additionally, the ICF International Review Board (IRB) looked over the survey and gave ethical approval.

Informed consent The respondents provided signed consent after being fully informed about the survey's purpose and procedures.

Consent for publication Not applicable.

Conflict of interest The authors declare that they have no conflict of interests.

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