Changes in Socioeconomic Inequalities in Unintended Pregnancies Among Currently Married Women in India

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Abstract

Background Despite the consistent prevalence of unintended pregnancies in India and its adverse impact on maternal and neonatal mortality, the literature discussing socioeconomic inequality remains scarce. This study aims to assess the change in wealth-related inequalities in unintended pregnancy in India from 2005-2006 to 2019-20 and to quantify the contribution of various factors towards inequality.

Methods The present study analyzed cross-sectional data from the third and fifth rounds of the National Family Health Survey (NFHS). The information on fertility preferences and pregnancy intention of most recent live birth during the five years preceding the survey was collected from eligible women. The concentration index and Wagstaff decomposition were used to analyze wealth-related inequality and the contributing factors.

Results Our results show that the prevalence of unintended pregnancy has declined in 2019-20 to 8% from 22% in 2005-2006. With the increase in education and wealth status, unintended pregnancy decreases significantly. The results of the concentration index depict that unintended pregnancy is more concentrated among the poor than the rich in India, and the individual's wealth status has the highest contribution to unintended pregnancy inequality. Other factors like mothers' BMI, place of residence and education also contribute majorly to the inequality.

Conclusions The study results are critical and increase the need for strategies and policies. Disadvantaged women need education and family planning information, plus access to reproductive health resources. Governments should improve accessibility and quality of care in family planning methods to prevent unsafe abortions, unwanted births, and miscarriages. Further research is needed to investigate the impact of social and economic status on unintended pregnancies.

Keywords Unintended pregnancy · Family planning · Contraception

Background

Pregnancies that are unplanned, mistimed, result of contraceptive failure or are unwanted at the time of conception are termed as unwanted pregnancies (Fourn et al., 1999; Karaçam et al., 2011). It is a major public health problem which is significantly associated with an increased risk of complications for millions of mothers, children and families worldwide (Finer & Zolna, 2011). According to the definition by the International Federation of Obstetricians and Gynecologists (FIGO), unintended pregnancy can be understood as "a gestation that is unwanted or mistimes during conception" (Hanson et al., 2015). Unintended pregnancies have a severe impact on mother's life, and it comes with multigenerational consequences (Dehlendorf et al., 2010; Finer & Zolna, 2016). Several studies have estimated global and regional estimates of unintended pregnancy, and it shows that globally around 121 million women had unintended pregnancies between 2015 to 2019 (Bearak et al., 2020). Out of all these unintended pregnancies, approximately 61% result in abortion, which is about 39 abortions per 1000 women in the reproductive age group (Bearak et al., 2020).

The prevalence of unintended pregnancy varies in high and low-middle-income countries (LMIC) (Ameyaw et al., 2019). Unintended pregnancies have decreased consistently

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in developed countries, whereas in Asian countries approx. 54 million unintended pregnancies occur each year. Unintended pregnancies have a considerable negative impact on health, social, and economic outcomes in LMICs (Dixit et al., 2012; Gipson et al., 2008; Monea & Thomas, 2011; Mohllajee et al., 2007). This contributes majorly to maternal, neonatal, and infant deaths because of severe complications and unsafe abortions (Singh et al., 2009). The prevalence of unintended pregnancies in developing countries is substantially higher, largely because of less education, an unmet need for contraception and a lack of knowledge about family planning (Dixit et al., 2012; Klima, 1998).

Previous studies have reported that unintended pregnancies cause delays in the prenatal care of newborns, which is associated with a high risk of physical and mental health problems in children (Gharaee & Baradaran, 2020). Unfavorable pregnancy results like premature births, perinatal depression, and stress are also outcomes of unintended pregnancies (Amin-Shokravi et al., 2009; Bearak et al., 2018). Other severe consequences of unintended pregnancies include unsafe abortions, malnutrition, and vertical transmission of HIV to children (Baschieri et al., 2017; Claridge & Chaviano, 2013). These consequences have a negative health impact on the well-being and quality of life of mothers. Additionally, socioeconomic and psychological impacts have also been discussed in earlier studies, which include the effect on the mother-child relationship, anxiety, unstable marriages, and economic cost on families (Gharaee & Baradaran, 2020; Yazdkhasti et al., 2015; Sonfield et al., 2013). Few studies have reported education as an important determinant of unintended pregnancy, and with increasing education, unintended pregnancy decreases (Dutta et al., 2015). However, there are some studies also which contradict this relationship between education and unintended pregnancy (Ikamari et al., 2013). The wealth status of women, place of residence and the total number of children ever born to a woman are also significant determinants of unintended pregnancy (Sarder et al., 2021; Islam et al., 2022). As the wealth status or economic condition of women has a key role to play, the health expenditure from public sources shows positive effects on achieving certain healthcare goals—increase life expectancy, reduce mortality, and improve universal healthcare service coverage. Thus, increasing the coverage rate of government-funded health insurance mechanisms could reduce the private out-of-pocket health expenditure and expand the healthcare services to uninsured people and can help to achieve sustainable development goals-3, i.e., ensure healthy lives and promote well-being for all at all ages (Behera & Dash, 2020).

In 2005-2006, around 22% of women had unintended pregnancies in India, which reduced to 8% in 2019-20 (IIPS & ICF, 2021). Studies from India have documented the association of unintended pregnancy with lower maternal healthcare utilization and children's poor health (Singh et al., 2012, 2013). Unintended pregnancies continue to be a persistent issue in India, with significant implications for maternal and neonatal health outcomes. However, despite its prevalence, there remains a dearth of literature exploring the socioeconomic inequality that underpins this problem. The earlier studies have largely focused on the prevalence and determinants of unintended pregnancy only. A comprehensive understanding of the complex relationship between unintended pregnancies and socioeconomic inequality in India has yet to be fully realized. To the best of our knowledge, no study has explored the impact of wealth-related inequality on unintended pregnancy in the Indian setting. Therefore, this study aims to assess the change in wealth-related inequalities in unintended pregnancy in India from 2005-2006 to 2019-20 and to quantify the contribution of various factors towards inequality.

Data and Methods

Data Source

The present study analyzed data from the third and fifth rounds of the National Family Health Survey (NFHS). The NFHS is a nationally representative large-scale sample survey conducted under the stewardship of the Ministry of Health and Family Welfare (MoHFW), Government of India. The prime objective of the survey is to provide national, state and district-level estimates on indicators such as maternal health, children's health, fertility, mortality, morbidity, women empowerment, family planning and domestic violence. The NFHS-3 and NFHS-5 were conducted in 2005-2006 and 2019-21, respectively. Both rounds of the survey adopted a two-stage stratified sampling strategy. In NFHS-3, a total of 124,385 women aged 15-49 and 74,369 men aged 15-54 were interviewed. Similarly, NFHS-5 covered 28 states and 8 union territories of India, covering a sample of 636,699 households, 724,115 women aged 15-49, and 101,839 men aged 15-54. The response rate of women, men and households in NFHS-5 was 97%, 92% and 98%, respectively. An informed consent protocol was followed prior to collecting the information, and only consented participants were included in the survey. Additional information about sampling, consent, protocol, and quality control measures is available in the survey report (IIPS & ICF, 2021).

Sample Selection

The information on fertility preferences and pregnancy intention of most recent live birth during the five years preceding the survey was collected from eligible women. The

final analytical sample reduces to 35,115 and 173,938 eligible women in NFHS-3 and NFHS-5, respectively.

Variables

Outcome Variable

The outcome variable used in this analysis was 'pregnancy intention of last birth'. In the survey, women were asked, 'When you got pregnant, did you want to get pregnant at that time?' The responses were "then," "later," or "not at all." Women who did not want their last birth or wanted later was considered unintended pregnancy. Further, the unintended pregnancy was dichotomized "1" as yes and "0" as no (Garg et al., 2022).

Exposure Variables

This study included relevant exposure variables suggested by existing literature (Dixit et al., 2012; Singh et al., 2012). The variables included in the analysis were the age of women (15-19 years, 20-24 years, 25-29 years, 30-34, years 35-39 years, and 40-49 years), educational status (no education, primary, secondary, and higher education), parity of women (1, 2-3 and 4+), mass media exposure (exposed, not exposed), religion (Hindu, Muslim, and others), social group (scheduled caste-SC, scheduled tribe-ST, other backward classes-OBC, and others), wealth index of the household (poorer, poor, middle, richer, and richest), place of residence (rural, urban) and geographical region (north, central, east, northeast, west, south). Women exposed to radio, newspapers and television were considered to be exposed to mass media. The wealth index in the NFHS survey was based on the ownership of assets and was calculated using principal component analysis.

Statistical Analysis

We have used bivariate and multivariate methods to analyze the data. A binary logistic regression was used to examine the determinants of unintended pregnancy.

$$logit\,p = ln\left(\frac{p}{1-p}\right)$$

$$= b_0 + b_1 x_1 + b_2 x_2 + \cdots + b_n x_n$$

where $b_0, b_1, b_2, .., b_n$ are coefficients of each exposure variable. Initially, the association of predictor variables with outcome variables was identified by chi-square analysis, and the significant variables were then taken into logistic regression.

Concentration Index

Inequality in unintended pregnancy was analyzed by concentration index (CI) (O'Donnell et al., 2007). Mathematically the CI can be expressed as

$$C = \frac{2}{n\mu} \sum_{i=1}^{n} y_i R_i - 1 \tag{1}$$

where y_i is unintended pregnancy of ith individual, μ is mean, R_i is fractional rank of the ith individual in terms of their socioeconomic index. The values of CI varies between -1 to +1; where the negative value indicates that inequality is concentrated in poor individuals and vice versa, and absolute zero denotes absence of inequality (O'Donnell et al., 2007).

Decomposition

Further, the concentration index was decomposed to explore the contribution of each predictor to the inequality in unintended pregnancy. We have used the decomposition approach suggested by (Wagstaff et al., 2003). This can be expressed as

$$y_i = \alpha + \sum_k \beta_k x_{ki} + \varepsilon_i \tag{2}$$

where x_{ki} is a set of determinant variables for the ith individual, β_k is coefficient and ε_i is the error term Concentration index for y can be shown as;

$$C = \sum_k \left(\frac{\beta_k \bar{x}_k}{\mu}\right) C_k + \frac{GC_\varepsilon}{\mu} = C_{\hat{y}} + \frac{GC_\varepsilon}{\mu} \tag{3}$$

where is μ the mean of y, $\bar{x}_k$ is the mean of x_k, C_k is the normalized concentration index for x_k, $\frac{\beta_k \bar{x}_k}{\mu}$ is the elasticity of unintended pregnancy with explanatory variables, and GC_ε is the generalized CI for ε_i. The Multicollinearity was assessed through the variance inflation factor (VIF) method and national individual sample weight was used in the analysis. The analysis was done in Stata (Version 16) with a 5% level of significance (StataCorp., 2021).

Results

Table 1 presents the sample characteristics of women aged 15-49 from NFHS-3 and NFHS-5. The data indicate that throughout time, there have been significant changes in some of the sample's background characteristics. First, the proportion of mothers between the ages of 15 to 19 has decreased from 7.6% in 2005-06 to 3.1% in 2019–21, while the proportion of mothers between the ages of 25 and

Table 1 Socio-economic profile of the study sample, 2005-06 and 2019-21

Background Characteristics	2005-06		2019-21	
	Freq (n=36,115)	Percentage	Freq (n=173,938)	Percentage
Mother's Age				
15-19	2729	7.6	5,427	3.1
20-24	12121	33.6	50,941	29.3
25-29	11740	32.5	67,437	38.8
30-34	6104	16.9	34,149	19.6
35-39	2476	6.9	12,541	7.2
40-49	944	2.6	3,443	2.0
Place of Residence				
Urban	9,706	26.88	49,015	28.2
Rural	26,409	73.1	1,24,923	71.8
Caste				
SC	7,226	20.0	39,345	22.6
ST	3,365	9.3	17,041	9.8
OBC	14,498	40.1	74,886	43.1
Others	11,027	30.5	42,667	24.5
Religion				
Hindu	28,516	79.0	1,38,478	79.6
Muslim	5,899	16.3	27,698	15.9
Others	1,700	4.7	7,762	4.5
Highest Educational level				
No Education	17,054	47.2	33,795	19.4
Primary	5,049	14.0	20,308	11.7
Secondary	11,845	32.8	89,680	51.6
Higher	2,166	6.0	30,156	17.3
Wealth Index				
Poorer	8,640	23.9	39,446	22.7
Poor	7,828	21.7	36,504	21.0
Middle	7,077	19.6	34,056	19.6
Richer	6,650	18.4	33,532	19.3
Richest	5,920	16.4	30,401	17.5
Total children ever born				
1	9,484	26.3	59,495	34.2
2-3	16,588	45.9	91,960	52.9
4+	10,043	27.8	22,483	12.9
Mass Media Exposure				
Not Exposed	10,891	30.2	45,611	26.2
Exposed	25,224	69.8	1,28,327	73.8
Mother's BMI*				
Underweight	13,124	38.0	31,520	18.6
Normal	18,749	54.2	1,03,130	61.0
Overweight	2,234	6.5	26,519	15.7
Obese	472	1.4	8,044	4.8
Region				
North	4,707	13.0	23,660	13.6
Central	4,645	12.9	46,419	26.7
East	301	0.8	44,928	25.8
Northeast	7,579	21.0	6,976	4.0
South	4,673	12.9	29,528	17.0
West	14,210	39.4	22,427	12.9

29 has climbed from 32.5% to 38.8%. Second, the proportion of the urban population has increased from 26.88% in 2005-06 to 28.2% in 2019-21. Thirdly, the proportion of OBC has slightly increased from 40.1% in 2005-06 to 43.1% in 2019–21, while the proportion of Other caste members has fallen from 30.5% to 24.5%. Fourth, there has been a rise in the proportion of mothers with secondary and higher education levels.

Table 2 Prevalence and association of unintended pregnancy by selected socio-economic characteristics, 2005-06 and 2019-21

Socioeconomic Variables	NFHS-3 (n=7,870) %	p value	NFHS-5 (n=12,962) %	p value
Age		p < 0.001		p < 0.001
15-19	14.6		8.4	
20-24	17.5		7.4	
25-29	21.6		7.3	
30-34	27.1		8.3	
35-39	35.7		11.1	
40-49	41.1		14.8	
Place of Residence		p < 0.001		p < 0.001
Urban	20.6		7.3	
Rural	22.6		8.2	
Religion				
Hindu	21.2		7.9	
Muslim	27.4		8.6	
Others	18.6		6.6	
Caste		p < 0.001		p < 0.001
SC	23.4		9	
ST	18.2		6.3	
OBC	21.7		7.5	
Others	22.9		8.5	
Highest Educational level		p < 0.001		p < 0.001
No Education	23.7		10.2	
Primary	22.5		9.2	
Secondary	21		7.6	
Higher	14.4		5.8	
Total children ever born		p < 0.001		p < 0.001
1	9.3		3.8	
2-3	20.1		8.5	
4+	37.4		16.8	
Mass Media Exposure		p < 0.001		p < 0.001
Not Exposed	23.1		9.6	
Exposed	21.7		7.4	
Mother's BMI		p < 0.001		
Underweight	23.6		9.1	
Normal	21.7		8	
Overweight	18		7.4	
Obese	18.5		6.6	
Region		p < 0.001		p < 0.001
North	18.3		8.7	
Central	22.2		8.3	
East	29.3		11.2	
Northeast	17.8		7.1	
South	14.2		4.3	
West	28		5.3	
Total	**22.1**		**8.0**	

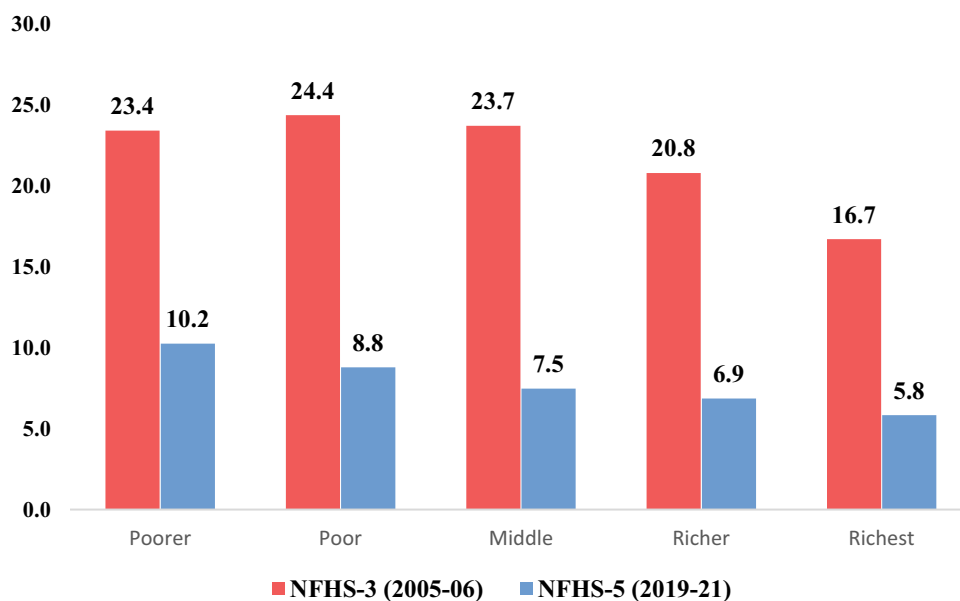**Fig. 2** Prevalence of unintended pregnancy by wealth quintiles, 2005-06 and 2019-21

Table 2 shows the prevalence of unintended pregnancy among women in India based on selected socio-economic characteristics in two different time periods, 2005-06 and 2019-21. The results reveal a significant decrease in the prevalence of unintended pregnancy from 22.1% in 2005-06 to 8.0% in 2019-21. The results also show that unintended pregnancy varies significantly by socio-economic characteristics. Women aged 15-19 and 20-24 years had a lower prevalence of unintended pregnancy in both time periods compared to women aged 40-49 years. Rural women, Muslim women, and women belonging to the Scheduled Castes (SC) had a higher prevalence of unintended pregnancy than their counterparts. Compared to women with secondary or higher education, unwanted pregnancy was more common among women with no education and those with only primary education. Unintended pregnancy was more common among women who had had four or more children overall than among those who had only one kid.

Figure 2 shows the prevalence of unintended pregnancy by wealth status in 2005-06 and 2019-20. There is an association between poverty and unwanted pregnancy, as evidenced by the fact from both rounds of the survey that the incidence of unintended pregnancies reduced as the wealth index increased.

Table 3 shows the result of logistic regression of the socioeconomic characteristics affecting unintended pregnancy in two-time periods, 2005-06 and 2019-21. In 2005-06, age was significantly associated with unintended pregnancy. Women aged 20-24, 25-29, and 30-34 had significantly lower odds of unintended pregnancy compared to women aged 15-19, while women aged 35-39 and 40-49 had significantly higher odds. Place of residence, wealth index, highest educational level, religion, caste, children ever born, mother's BMI, and

the region was not significantly associated with unintended pregnancy in 2005-06.

In 2019-21, age was also significantly associated with unintended pregnancy. Women aged 30-34, 35-39, and 40-49 had significantly higher odds of unintended pregnancy compared to women aged 15-19, while women aged 20-24 and 25-29 did not have significantly different odds. Place of residence, wealth index, highest educational level, religion, and caste were significantly associated with unintended pregnancy in 2019-21. Women living in rural areas had significantly higher odds of unintended pregnancy compared to women living in urban areas. Women in the richest wealth quintile had significantly lower odds (OR=0.71, CI=0.63,0.81) of unintended pregnancy compared to women in the poorest quintile. Women with primary education (OR=1.12, CI=1.04,1.21) had significantly higher odds of unintended pregnancy compared to women with no education, while women with higher education had significantly lower odds (OR=0.74, CI=0.65,0.84). Muslim women had significantly lower odds (OR=0.88, CI=0.82,0.95) of unintended pregnancy compared to Hindu women. Women belonging to scheduled tribes (ST) (OR=0.64, CI=0.57,0.71) and other backward classes (OBC) (OR=0.82, CI=0.76,0.88) had significantly lower odds of unintended pregnancy compared to women belonging to other castes.

The concentration indices for unintended pregnancy in India, as presented in Table 4, indicate a concerning trend of increasing inequality over time. The data reveals a decrease in the concentration index from -0.0548 in 2005-06 to -0.1133 in 2019-21, which indicates a shift towards a more unequal distribution of unintended pregnancy in India. The negative value of CI depicts that unintended pregnancy is

Table 3 Associations between unintended pregnancy and selected background characteristics among currently married women: results from logistic regression

Socioeconomic Variables	NFHS-3 (2005-06)		NFHS-5 (2019-21)	
	OR	95% CI	OR	95% CI
Age				
15-19	1	[1.00,1.00]	1	[1.00,1.00]
20-24	0.78**	[0.66,0.93]	0.92	[0.68,1.25]
25-29	0.67***	[0.56,0.80]	1.34	[0.99,1.81]
30-34	0.69***	[0.57,0.84]	1.64**	[1.21,2.24]
35-39	0.89	[0.72,1.10]	2.21***	[1.62,3.02]
40-49	1.02	[0.79,1.32]	2.72***	[1.97,3.75]
Place of Residence				
Rural	1.08	[0.99,1.19]	1.20***	[1.12,1.29]
Urban	1	[1.00,1.00]	1	[1.00,1.00]
Wealth Index				
Poorest	1	[1.00,1.00]	1	[1.00,1.00]
Poor	1.09	[0.98,1.22]	0.96	[0.90,1.04]
Middle	1.12*	[1.00,1.26]	0.92	[0.84,1.00]
Richer	0.94	[0.82,1.07]	0.90*	[0.82,1.00]
Richest	0.85*	[0.72,0.99]	0.71***	[0.63,0.81]
Highest Educational Level				
No Education	1	[1.00,1.00]	1	[1.00,1.00]
Primary	1.35***	[1.21,1.51]	1.12**	[1.04,1.21]
Secondary	1.75***	[1.58,1.94]	1.03	[0.96,1.11]
Higher	1.56***	[1.28,1.91]	0.74***	[0.65,0.84]
Religion				
Hindu	1	[1.00,1.00]	1	[1.00,1.00]
Muslim	1.16**	[1.05,1.28]	0.88***	[0.82,0.95]
Others	1.03	[0.89,1.18]	0.85*	[0.73,0.98]
Caste				
SC	0.89*	[0.80,0.99]	0.96	[0.89,1.04]
ST	0.73***	[0.64,0.84]	0.64***	[0.57,0.71]
OBC	0.79***	[0.73,0.87]	0.82***	[0.76,0.88]
Others	1	[1.00,1.00]	1	[1.00,1.00]
Children Ever Born				
1	1	[1.00,1.00]	1	[1.00,1.00]
2-3	2.83***	[2.53,3.16]	5.52***	[4.89,6.24]
4+	7.42***	[6.48,8.50]	16.90***	[14.78,19.32]
Mass Media Exposure				
Not Exposed	1	[1.00,1.00]	1	[1.00,1.00]
Exposed	1.21***	[1.10,1.32]	1.03	[0.96,1.09]
Mother's BMI				
Underweight	1	[1.00,1.00]	1	[1.00,1.00]
Normal	0.92*	[0.86,0.99]	0.83***	[0.78,0.89]
Overweight	0.75***	[0.64,0.87]	0.89*	[0.81,0.97]
Obese	0.78	[0.58,1.05]	0.95	[0.83,1.09]
Region				
North	1	[1.00,1.00]	1	[1.00,1.00]
Central	1.22**	[1.06,1.40]	0.86***	[0.79,0.94]
East	1.64***	[1.38,1.94]	1.16***	[1.07,1.27]
Northeast	0.89	[0.79,1.01]	0.91	[0.78,1.06]
South	0.63***	[0.55,0.73]	0.59***	[0.52,0.66]
West	1.44***	[1.29,1.62]	0.68***	[0.61,0.76]
Observations	**34579**		**169212**	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

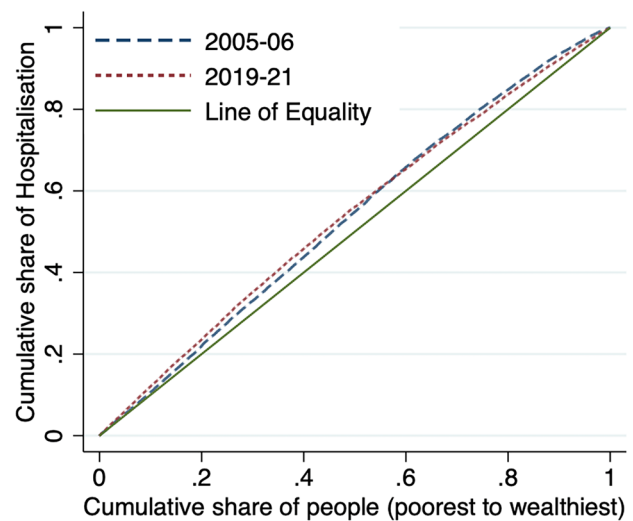**Table 4** Concentration indices for unintended pregnancy in India, 2005-06 and 2019-21

Year	Concentration Index	Robust std. Error	p value
2005-06	-0.0548	0.0056	<0.0001
2019-21	-0.1133	0.0046	<0.0001
CI$_{2005-06}$ - CI$_{2019-20}$	0.059		

more concentrated among the poor than the rich in India. The concentration curve in Fig. 3 illustrates the same wealth-related inequality. Both curves lie above the line of equality, indicating that unintended pregnancies are more among poor people.

Further, we decomposed the concentration index of unintended pregnancy against socioeconomic characteristics to determine the relative contribution of each predictor to inequality. Results in Table 5 show the individual wealth-related contribution of the predictor variables to the unintended pregnancy. Individuals' wealth status has the highest contribution to unintended pregnancy inequality. It was 46% in 2005-06 and increased to 52% by 2019-21. Followed by the mother's BMI, which accounted for approximately 34% of unintended pregnancy inequality and declined by 2% in 4 years. Mother's education also majorly contributes to unintended pregnancy, with 22% in 2005-06 and 16% in 2019-21. Contribution of the place of residence has drastically increased for unintended pregnancy inequality from 20% in 2005-06 to 23% in 2019-21.

Discussion

According to the findings of this study, the concentration curve for unwanted pregnancy is higher than the line of equality. This suggests that unwanted pregnancy is more common among the poor, and there is a disparity in favor of the poor in India when it comes to unintended pregnancy. The inequality still persists in unintended pregnancy by wealth status of women from 2005-06 to 2019-21 in India, though it has decreased slightly. The contribution of the wealth status of women in unintended pregnancy has increased over the years (IIPS & ICF, 2021). Previous studies across the globe have also found wealth status as one of the major determinants of unintended pregnancy of women (Islam et al., 2022). A past study of Bangladesh found that poverty is strongly correlated with both unmet need for contraception and unintended pregnancy, and women from lower-income families are clearly less likely to be able to afford personal healthcare, such as reproductive health services, and are more likely to have unwanted pregnancies and other pregnancy-related issues (Bishwajit et al., 2017).

Fig. 3 Concentration curves for unintended pregnancy in India, 2005-06 and 2019-21

Unintended pregnancy is more among women with lower wealth status, and there may be several reasons behind this; due to lower wealth status, they have less affordability of buying contraception (Bishwajit et al., 2017; Font-Ribera et al., 2008). Another reason behind this could be the high contraceptive discontinuous rate and method failure within poorer sections of women, which also leads to unintended pregnancy (Agrahari et al., 2016, 2017). A recent study also shows that during the COVID-19 pandemic, two particular reasons - unable to access due to lockdown restrictions and fear of being infected with COVID-19 were reported as mostly impacting the access to contraception facilities due to lockdown restriction, which may further add up in the number of unintended pregnancies and women with poor financial background were the most vulnerable (Behera, 2023).

Unintended pregnancies have several negative outcomes on women's health as well as on child's health. If pregnancy is unintended, then there is a very low chance that women will seek maternal health care utilization services, i.e., antenatal care, institutional delivery and post-natal care properly and which will negatively affect the mother's health as well as the child's health (Cheng et al., 2009; Hajizadeh & Nghiem, 2020). Unintended pregnancy may also be associated with maternal complications- pre-eclampsia, postpartum hemorrhage and postpartum pre-eclampsia (Dehingia et al., 2020). The unwanted births were likely to receive inadequate prenatal care and inadequate childhood vaccinations as well as at higher risk of neonatal mortality compared to wanted births (Singh et al., 2013). Unintended pregnancy causes serious health issues in mothers and children (Gharaee & Baradaran, 2020). Mother's physical and mental health is affected due to unsafe abortion, trauma, depression, anxiety etc., and the health of the newborn will also be affected

Table 5 Elasticities, concentration indices, and contributions of determinants to wealth-related inequality for unintended pregnancy in India in 2005-06 and 2019–21

Variables		NFHS-3 (2005-06)			NFHS-5 (2019-21)		
		Elasticity	CI	Percent Contribution	Elasticity	CI	Percent Contribution
Age	20-24	-0.091	-0.047	-2.3	-0.097	-0.078	-4.0
	25-29	-0.199	0.045	2.3	-0.234	0.040	2.0
	30-34	-0.121	0.057	2.9	-0.142	0.084	4.3
	35-39	-0.033	-0.020	-1.0	-0.040	0.022	1.1
	40-49	-0.002	-0.191	-9.6	-0.006	-0.146	-7.4
SUM				*-7.8*			*-4.0*
Children Ever Born	2-3	0.351	0.018	0.9	0.400	0.010	0.5
	4+	0.299	-0.310	-15.6	0.239	-0.355	-18.1
SUM				*-14.7*			*-17.6*
Wealth Status	Poor	0.003	-0.428	-21.5	-0.005	-0.337	-17.2
	Middle	0.004	0.180	9.1	-0.014	0.069	3.5
	Richer	-0.003	0.481	24.2	-0.015	0.458	23.3
	Richest	-0.011	0.681	34.3	-0.030	0.825	42.0
SUM				*46.1*			*51.7*
Education	Primary	-0.003	-0.206	-10.3	0.010	-0.265	-13.5
	Secondary	0.007	0.100	5.0	0.091	0.052	2.7
	Higher	0.014	0.534	26.9	0.048	0.522	26.6
SUM				*21.5*			*15.8*
Place of residence	Urban	0.022	0.404	**20.3**	0.034	0.453	**23.1**
Religion	Muslim	-0.002	0.006	0.3	-0.018	0.004	0.2
	Others	0.000	0.172	8.7	-0.001	0.195	9.9
SUM				*8.9*			*10.1*
Caste	ST	-0.033	-0.341	-17.1	-0.030	-0.393	-20.0
	OBC	-0.030	0.042	2.1	-0.032	0.054	2.8
	Others	0.026	0.165	8.3	0.017	0.183	9.3
SUM				*-6.7*			*-8.0*
Mass Media Exposure	Exposed	0.083	0.156	**7.8**	0.062	0.170	**8.6**
Mother's BMI	Normal	-0.081	-0.017	-0.9	-0.078	-0.031	-1.6
	Overweight	-0.028	0.286	14.4	-0.016	0.263	13.4
	Obese	-0.009	0.414	20.8	-0.007	0.393	20.0
SUM				*34.3*			*31.8*
Region	Central	0.013	-0.085	-4.3	-0.042	-0.084	-4.3
	East	0.022	-0.293	-14.8	0.051	-0.329	-16.8
	Northeast	0.008	-0.205	-10.3	-0.008	-0.324	-16.5
	South	-0.054	0.269	13.6	-0.088	0.278	14.2
	West	0.020	0.120	6.1	-0.055	0.231	11.8
SUM				*-9.7*			*-11.6*

as the pregnancy was unintended (Amin-Shokravi et al., 2009; Bearak et al., 2018). The emotional effect is very much there in relation to mother-child bonding and the relationship between husband and family members (Gharaee & Baradaran, 2020; Yazdkhasti et al., 2015; Sonfield et al., 2013). Further, this might lead to severe issues and restrain women from leading a sound physical and mental well-being.

There can be several measures through which these unintended pregnancies can be reduced or eliminated. Improving access to quality contraception as an important intervention to reduce or eliminate unintended pregnancy and further a re-emphasis on modern spacing methods of contraception

as an intervention to ensure informed decision-making and to avoid possible post-sterilization health problems (Singh et al., 2013; Pradhan & Mondal, 2023). The increased coverage of government-funded health insurance mechanisms could reduce private out-of-pocket health expenditure and expand healthcare services to uninsured vulnerable people (Behera & Dash, 2020). There is a National health policy, 2017 in place which focuses on meeting the need for family planning but more focus on socially and economically vulnerable groups through grassroots level health workers, i.e., Accredited Social Health Activists (ASHA) can ensure improvement in family planning use and reduce the

risk of unintended pregnancy (Ministry of Health & Family Welfare, 2017). The ASHA should practically literate the women about methods of contraception and their proper use because incorrect use of contraception is also a reason for unintended pregnancies (Tanne, 2008). In the current family planning program of the government of India, Emergency Contraceptive Pills (ECPs) is there, but re-emphasizing spreading knowledge and accessibility through ASHAs regarding Emergency Contraceptive Pills (ECPs) can be another way to reduce unintended pregnancy (Davis et al., 2020). Strengthening of Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) may also have a positive effect through increasing knowledge with interaction with health staff (NHM, 2016).

Among women in rural areas, the chances of unintended pregnancy are high than in urban areas. Previous studies have also found similar findings, and this may be due to a better knowledge of emergency contraceptive use and family planning among urban women (Sarder et al., 2021). As the number of children ever born increases, unintended pregnancy in women also increases. This is in line with previous studies also (Kassa et al., 2012). If women have higher education, then they also she has a lesser chance of having unintended pregnancies than less educated women due to their enhanced knowledge and awareness about family planning methods and their effective use (Dutta et al., 2015). A Lancet study showed that the incidence of unintended pregnancies is attributed to the unmet need for contraception and safe abortion services in the public sectors (Singh et al., 2018).

Further, we found that the rate of unintended pregnancy was higher among women aged 30 or above. Our findings contradict previous studies which reported that women of younger ages (below 20 years) were at higher risk of unintended pregnancies (Finer & Zolna, 2016; Kornides et al., 2015). According to their age, the rate of unintended pregnancy also increases, which depicts that women aged over 30 years are more likely to have unintended pregnancies. Previous studies have shown that unintended pregnancy may be caused by the less availability and awareness of contraception and lack of proper healthcare services while these occur due to socioeconomic inequality. However, the prevalence of unintended pregnancy is still higher among women belonging to Muslims, SC castes, lower education, lower wealth status, and women residing in rural areas.

This study has several strengths like, this study uses the most recent nationally representative data of India, which made this study relevant, and the large-scale dataset provides robust estimates of variables under consideration. This study also compares the last two rounds of NFHS and fulfils the gaps in the literature. Our study also met with certain limitations, such as the cross-sectional nature of the data limiting us from making any causal inference. Longitudinal research is needed to investigate the causal relationship of unintended pregnancy with various socio-economic characteristics.

Conclusion

This study found wealth-related inequality among married women in unintended pregnancy. Unintended pregnancies lead to severe problems for the mother as well as the new-born. As unintended pregnancy is a very serious problem and has several repercussions, it must be looked after carefully. The evidence highlights an association between low socioeconomic status and a heightened risk of unintended pregnancies. In order to mitigate this association, it is imperative to augment knowledge dissemination pertaining to the adverse consequences of unintended pregnancies among economically disadvantaged women.

This can be achieved through targeted family planning education and information campaigns, empowering individuals to make well-informed reproductive health decisions. Equitable accessibility to reproductive health resources and services, regardless of socioeconomic standing, must also be ensured. Government should focus on improved accessibility and quality of care in family planning methods. Unintended pregnancy has long been considered a strong indicator of contraception use which raises the need for improvement in the awareness and services for contraception. In India, despite increased contraceptive use, many married women experience unintended pregnancies, which results in unsafe abortions, unwanted birth, and miscarriages, all of which are translated according to their socioeconomic position. Changes in social and economic status might lead to a desire for smaller families and indirectly have an impact on pregnancy intention and the demand for contraception uses. As this study is based on a secondary quantitative data source, we are unable to investigate the pathways through which unintended pregnancies are affected by the economic conditions of women, or there may be an amalgamation of different factors working together behind unintended pregnancies. In future studies, there is ample scope to investigate this research gap further with primary qualitative data.

Declarations

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