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Original Article

Predictors of Unintended Pregnancy among Indian women: An analysis from NFHS-IV Survey

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ABSTRACT

Background: Low levels of women's decision-making over control of sexual intercourse, contraceptive use, domestic violence with intimate partners not only have impact on socioeconomic and cultural aspects but also on unintended pregnancies. Which create serious public health issues associated with physical, reproductive and mental health consequences.

Objectives: The aim of this study was to explore the predictors of unintended pregnancy among socio-demographic factors, contraceptive use, family planning methods, media exposure etc. among Indian women. State-wise prevalence of unintended pregnancies was also investigated to see which states need more attention

Methods: A total of 32225 married women aged between 15-49 years, who responded on current pregnancy wanted were observed in NFHS-IV (2015-16) survey data. Out of total 3,838 were found unintended pregnant women for this study. Logistic regressions were used for analysis using SPSS23 software.

Results: The mean age of 3,838 women respondents was 25.27 ± 4.97 years. 12.3% of them were unintended pregnancies. Women aged between 25-34 years (OR = 1.22, 95% CI: 1.149-1.31) and 35-49 years (OR = 2.17, 95% CI: 1.90-2.48) were more likely to have an unintended pregnancy than 15–24 years. Unintended pregnancy prevalence was highest among Muslim women (14.9%), followed by Hindus (11.8%), Christians (8.5%), and other religions (8.8%). Muslims were 30% more likely (OR=1.30; 95% CI: 1.20-1.42; p<0.001) to experience unintended pregnancy compared to Hindus, while Christians were 31% and women of other religions were 28% less likely. Families with more than four members had a higher prevalence (13.9%) compared to those with four or fewer members (8.4%). Women from larger families were 76% more likely (OR=1.76; 95% CI: 1.63-1.90; p<0.001) to experience unintended pregnancy.

Conclusions: Sociodemographic disparities need to be addressed to promote reproductive health and welfare services. Preventing physical violence by intimate partners against women could reduce unintended pregnancy.

Keywords: *Unintended Pregnancy, NFHS-4, India, Women*

INTRODUCTION

Unintended pregnancies happen when a pregnancy is mistimed, unplanned, or unwanted at the time of conception.[1-6] A pregnancy is considered unwanted when a woman does not want any more children, while a mistimed pregnancy occurs earlier than desired.[1,4,6] In contrast, planned pregnancies happen at the right time or later than expected. Around 213 million pregnancies occur worldwide each year, with most (56%) happening in Asian countries.[7,9] between 2010 and 2014, about 44% of pregnancies worldwide were unintended, and 56% of these ended in abortion. Studies have shown a global decline in unintended pregnancies, from 74 per 1,000 women in 1990–94 to 62 per 1,000 in 2010–14.[6,10]In India, there were 48.1 million pregnancies in 2015, of which 54% led to live births, 32% resulted in induced abortions, and 14% in miscarriages. The unintended pregnancy rate among women aged 15–49 was approximately 70.1 per 1,000 women.[6, 11] Unintended pregnancies are common in low- and middle-income countries, with about 89 million such cases occurring annually.[12] According to the UNFPA's 2022 report, only 57% of women worldwide have full control over their sexual and reproductive health decisions.[13] In India, studies on unintended pregnancies are limited, especially regarding

adolescent girls and young women. Therefore, this study aims to examine how common unintended pregnancies are among young females in Uttar Pradesh and Bihar, explore how social and economic factors affect these pregnancies, and identify key reasons behind them.[14]In many societies, it is common for married couples to engage in sexual relations without using contraception, even with mutual consent, which sometimes leads to unintended pregnancies. This creates public health concerns, affecting a woman's physical, reproductive, and mental well-being.[15-17] Many women hesitate to talk about contraception due to fear of their partner's reaction, and some lack awareness of its benefits. Unintended pregnancies can happen to women of all ages, backgrounds, and marital statuses, but some factors increase the likelihood.[15]Unintended pregnancies are linked to various health issues for both mother and child, including unsafe abortions, low birth weight, and poor prenatal care.[3] Understanding pregnancy intentions is essential for improving access to contraception, analyzing fertility trends, and ensuring better maternal and child health outcomes.[4] The chances of unintended pregnancy increase as women get older and have more children. Women aged 40–44 have more unintended pregnancies than those aged 15–19. Similarly, women with three or more children have a higher rate of unintended pregnancy, while those with only one child have a much lower rate [18,19]. Education and financial status also affect unintended pregnancy rates. Women with little or no education and those from poorer families are more likely to have unintended pregnancies. The rate is higher among uneducated women but lower for those with more education. Likewise, women from the poorest households have a higher rate, while the wealthiest women have a much lower rate [19,20]. In states like Bihar and Uttar Pradesh, high unintended pregnancy rates among adolescents and young women are linked to a lack of exposure to media, limited internet access, and low awareness of contraception women autonomy, low education etc. Cultural and regional differences also matter, as women from Scheduled Castes have a 10.1% unintended pregnancy rate, and Muslim women report a rate of 9.5%. Additionally, unintended pregnancies are more common in rural areas (9.3%) than in urban settings (8.4%).[19] Early marriage is another important factor. Women who marry before 18 have more unintended pregnancies than those who marry later. Intimate partner violence (IPV) further increases the risk, as studies show that 22.9% of women who experience sexual violence in marriage report unintended pregnancies, compared to 14.3% of those facing physical violence.[20] Limited knowledge and inconsistent use of contraception are also key reasons for unintended pregnancies[19] Unintended pregnancies help researchers understand fertility trends and the unmet need for contraception. Most unintended pregnancies occur because women either do not use contraception or do not use it correctly. This issue is a serious public health concern because it can lead to malnutrition, illness, abuse, neglect, or even death for both mother and child. It can also put financial strain on families. This study examines the prevalence of unintended pregnancies across different Indian states and investigates how socio-economic factors, contraceptive use, and family planning awareness influence these pregnancies. Many studies have identified various reasons for unintended pregnancies worldwide. Understanding these reasons is crucial for developing effective strategies to reduce unintended pregnancies and improve maternal and child health.

METHODS

Data sources

National Family Health Survey (NFHS) is a large scale nationally representative cross-sectional survey conducted in India by International Institute of Population Sciences (IIPS), Mumbai under the stewardship of the Ministry of Health and Family Welfare (MoHFW), Government of India. NFHS provides information on population, health, and nutrition for India and each state and union territory. NFHS collects data of all individual ever-married women aged 15 to 49 years in the household using personal interviews by trained interviewers and a well-designed questionnaire in India. The survey used a two-stage stratified sampling technique, sampling within administrative areas. The detail of the study design was described elsewhere. Dataset is available to the public online. This study was a cross-sectional study, used the fourth round of National Family Health Survey (NFHS-IV), a nationwide data of India (2015–2016)The NFHS-IV was conducted from 20 January 2015 to 4 December 2016. This survey covered 572,000 households in 640 districts of India. A total of 32428 women reported on the outcome of interest (i.e. current pregnancy) in this survey. Out of these total women, 3893 were reported about their unintended pregnancy.

Dependent variable

The main outcome variable for this study was pregnancy intentions status. "Pregnancy intention" was attributed to the dependent variable of this study, which is related to whether or not women intended their current pregnancy. It was asked from currently pregnant women that, "did you want to get pregnant at that time?" or. "did you want to have a baby later on, or did you not want any (more) children?". The responses were, namely: 'then', 'later' and 'not at all'. Those women who responded, they wanted to have a baby later on, or did not want any (more) children were considered unintended pregnant women, while others considered as they wanted pregnancy. For simplicity we have coded these three responses as follows: 'then' for intended (0); 'later or not at all' for 'unintended (1)' based on the definition of unintended pregnancy.

Independent variables

A set of categorical explanatory variables were considered as independent variables namely age (15-24, 25-34, 35-49), residence (urban, rural), educational level (no education, primary, secondary and higher), wealth index

(poorest, poorest, middle, richest, richest), religion (Hindu, Muslim, Christian, and others), caste (SC, ST, OBC, Others/General), household head (male, female), number of children (no children, 1–2 children, 3 or more), family size (≤ 4, > 4), currently residing with husband/partner (living with a partner, living elsewhere), age at first cohabitation (≤ 19 years, > 19 years), total children ever born (No children, one children, two children and three or more children), ever had terminated pregnancy (Yes, No), Media exposure (Yes, No). These variables were selected because there was a significant association with pregnancy intention and they have been reported as predictors of unintended pregnancy.

Statistical analysis

Descriptive analysis was undertaken to describe the frequency and percentage distribution. Bivariate analysis was used to examine the association between unintended pregnancy and selected independent variables Multivariable binary logistic regression analysis was conducted to evaluate the impact of various factors, including sociodemographic characteristics, contraceptive use, family planning methods, and media exposure, on unintended pregnancy. This method was chosen because unintended pregnancy is a binary outcome (Yes/No), allowing for the assessment of multiple risk factors. It provides adjusted odds ratios (AORs) with confidence intervals, enabling the identification of significant predictors while accounting for confounding variables. The results of logistic regression analysis were presented using adjusted odds ratios (AORs) with 95% confidence intervals. High risk factors were identified based on p-value ($p<0.05$). All statistical analysis were performed in IBM SPSS V23.

RESULTS

States wise unintended pregnancy of participants

Figure 1: A total of 32,225 women reported their current pregnancy status in NFHS-IV, with 3,838 (11.9%) indicating that their pregnancies were unintended. Figure 1 illustrates the state-wise prevalence of unintended pregnancies in India, ranging from 1.4% in Andhra Pradesh, the lowest, to 20.9% in Uttar Pradesh, the highest. States such as Tamil Nadu (2.0%), Goa (2.9%), and Puducherry (3.5%) also report relatively low rates, suggesting better access to family planning services and effective contraceptive use. Conversely, states like Bihar (14.7%), Jharkhand (15.1%), Himachal Pradesh (15.4%), and West Bengal (17.1%) report significantly higher rates, reflecting potential gaps in reproductive health education and limited access to contraception. Uttar Pradesh (20.9%) and Delhi (18.1%) exhibit the highest percentages, emphasizing substantial challenges in family planning policies and the influence of socio-economic factors on reproductive choices.

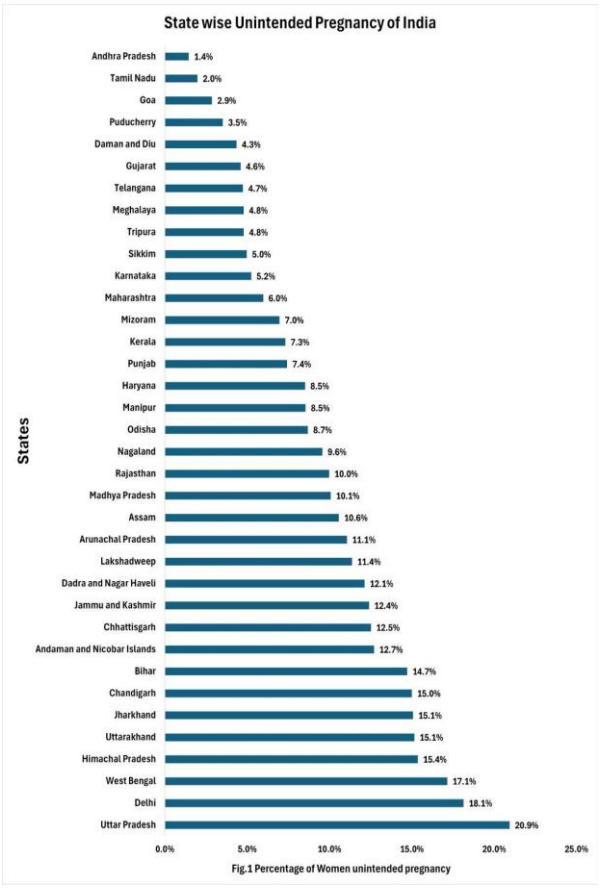

Fig 1. Percentage of Women Unintended Pregnancy

Table1: Association of Socio-demographic characteristics with unintended pregnancy

Dependent: Unintended pregnancy & its subcategories		Status of Current Pregnancy		OR (95%CI, P value) (univariable)
		Intended, N (%)	Unintended, N (%)	
Age Group*	15-24 years	15455 (89.4)	1832 (10.6)	-
	25-34 years	11714 (87.4)	1692 (12.6)	1.22 (1.14-1.31, p<0.001)
	35-49 years	1218 (79.5)	314 (20.5)	2.17 (1.90-2.48, p<0.001)
Place of residence*	Urban	6990 (90.2)	763 (9.8)	-
	Rural	21397 (87.4)	3075 (12.6)	1.32 (1.21-1.43, p<0.001)
Women Education*	No education	6821 (84.2)	1280 (15.8)	-
	Primary	3670 (86.3)	583 (13.7)	0.85 (0.76-0.94, p=0.002)
	Secondary	14265 (89.4)	1694 (10.6)	0.63 (0.59-0.68, p<0.001)
	Higher	3631 (92.8)	281 (7.2)	0.41 (0.36-0.47, p<0.001)
Caste*	SC	5392 (86.8)	820 (13.2)	-
	ST	5533 (90.8)	562 (9.2)	0.67 (0.60-0.75, p<0.001)
	OBC	11262 (87.3)	1634 (12.7)	0.95 (0.87-1.04, p=0.305)
	Others/General	6200 (88.3)	822 (11.7)	0.87 (0.79-0.97, p=0.009)
Religion*	Hindu	20434 (88.2)	2732 (11.8)	-
	Muslim	4449 (85.1)	776 (14.9)	1.30 (1.20-1.42, p<0.001)
	Christian	2255 (91.5)	209 (8.5)	0.69 (0.60-0.80, p<0.001)
	Others	1249 (91.2)	121 (8.8)	0.72 (0.60-0.87, p=0.001)
Wealth Index*	Poorest	6474 (84.9)	1152 (15.1)	-
	Poorer	6544 (86.3)	1039 (13.7)	0.89 (0.81-0.98, p=0.014)
	Middle	5830 (89.1)	716 (10.9)	0.69 (0.62-0.76, p<0.001)
	Richer	4982 (89.9)	560 (10.1)	0.63 (0.57-0.70, p<0.001)
	Richest	4557 (92.5)	371 (7.5)	0.46 (0.40-0.52, p<0.001)
Gender of head of household*	Male	24922 (88.0)	3413 (12.0)	-
	Female	3465 (89.1)	425 (10.9)	0.90 (0.80-1.00, p=0.043)
No. of household members in a family*	<= 4 Members	10794 (91.6)	992 (8.4)	-
	> 4 Members	17593 (86.1)	2846 (13.9)	1.76 (1.63-1.90, p<0.001)
Number of children in a family**	No Children	12499 (93.8)	832 (6.2)	-
	1-2 Children	14418 (84.7)	2605 (15.3)	2.71 (2.50-2.95, p<0.001)
	>2 Children	1470 (78.6)	401 (21.4)	4.10 (3.59-4.67, p<0.001)
Currently residing with husband/partner***	Living with her	25330 (88.2)	3398 (11.8)	-
	Staying elsewhere	3057 (87.4)	440 (12.6)	1.07 (0.96-1.19, p=0.194)
Age at first cohabitation*	<= 19 years	15867 (86.5)	2479 (13.5)	-
	> 19 years	12520 (90.2)	1359 (9.8)	0.69 (0.65-0.75, p<0.001)
Total children ever born*	No Children	11892 (94.9)	641 (5.1)	-
	One Children	8870 (88.6)	1140 (11.4)	2.38 (2.16-2.64, p<0.001)
	Two Children	4284 (83.3)	860 (16.7)	3.72 (3.34-4.15, p<0.001)
	Three & More Children	3341 (73.6)	1197 (26.4)	6.65 (6.00-7.37, p<0.001)
Ever had terminated pregnancy*	No	24439 (88.4)	3217 (11.6)	-
	Yes	3948 (86.4)	621 (13.6)	1.19 (1.09-1.31, p<0.001)

Media exposure about family planning*	No	11338 (85.7)	1889 (14.3)	-
	Yes	17049 (89.7)	1949 (10.3)	0.69 (0.64-0.73, p<0.001)

Table 1 Shows the descriptive as well as univariable analysis of the socio-demographic, household characteristics and family planning with unintended pregnancy of women who were currently pregnant at the time of the survey. All the socio-demographic and household characteristics were found statistically significantly associated with unintended pregnancy except women currently residing with husband/partner. Univariable analysis of age groups indicates that as the age of women increases, the prevalence of unintended pregnancy also rises. The lowest prevalence was observed in the 15-24 age group (10.6%), while the highest was in the 35-49 age group (20.5%). Univariable logistic regression results show that women aged 35-49 years were 2.17 times more likely, and those aged 25-34 years were 1.22 times more likely, to experience unintended pregnancy compared to the 15-24 age group. This trend may be attributed to the cumulative exposure to pregnancy risk over time, changing fertility desires, and contraceptive failure among older women. Regarding place of residence, rural women exhibited a higher prevalence of unintended pregnancy (12.6%) than their urban counterparts (9.8%). Women residing in rural areas were 22% more likely to experience an unintended pregnancy than those in urban areas. The higher unintended pregnancy rates in rural areas may be linked to limited access to healthcare facilities, lower levels of education, lack of family planning services, and traditional societal norms that emphasize larger families. Education was also a significant factor; unintended pregnancy prevalence decreased with increasing education levels. The highest prevalence was observed among women with no formal education (15.8%), while those with higher education had the lowest prevalence (7.2%). Educated women are more likely to be aware of and have access to contraceptive methods, understand reproductive health better, and make informed decisions about family planning. Caste-wise analysis revealed that Scheduled Caste women had the highest unintended pregnancy prevalence (13.2%), followed by Other Backward Castes (12.7%), General Category (11.7%), and Scheduled Tribes (9.2%). This may be due to socio-economic disparities, differential access to healthcare, and variations in cultural practices related to fertility and contraception. Similarly, unintended pregnancy prevalence was highest among Muslim women (14.9%), followed by Hindus (11.8%), Christians (8.5%), and other religions (8.8%). Muslims were 30% more likely (OR=1.30; 95% CI: 1.20-1.42; p<0.001) to experience unintended pregnancy compared to Hindus, while Christians were 31% and women of other religions were 28% less likely. Religious beliefs and norms regarding contraception use, family size, and gender roles can play a significant role in shaping reproductive behaviour. Economic status played a significant role, with a decreasing trend in unintended pregnancy from the poorest to the richest wealth index. Women in the poorest category had the highest prevalence (15.1%), whereas those in the richest category had the lowest (7.5%). Financial constraints can limit access to modern contraceptive methods, and poorer women may have less autonomy in reproductive decision-making. Household characteristics also impacted unintended pregnancy rates. Abortion history was also associated with unintended pregnancy. Women who had previously had an abortion reported a prevalence of 13.6%, compared to 11.6% among those who had not. Those who had undergone an abortion were 19% more likely (OR=1.19; 95% CI: 1.09-1.31; p<0.001) to experience unintended pregnancy. This may indicate inconsistent contraceptive use, lack of post-abortion contraceptive counselling, or barriers to family planning services.

Fig 2. Multiple Logistic Regression and its pictorial presentation

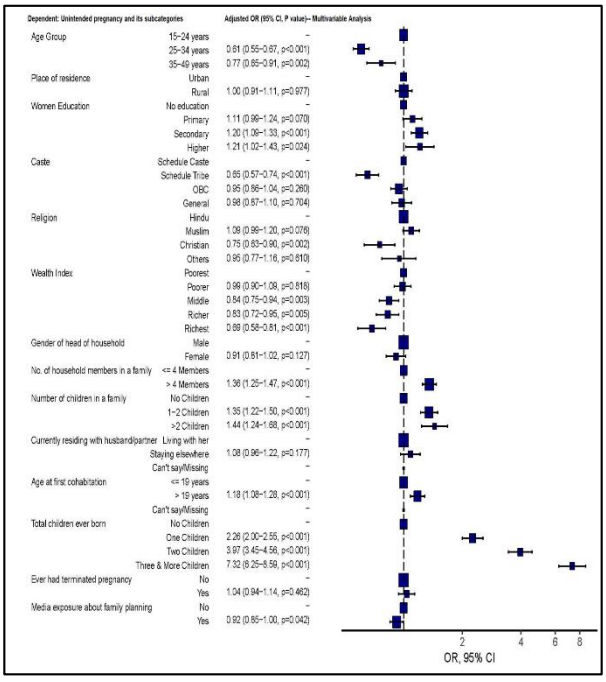

Figure: 2 The socio-demographic and household characteristics, along with family planning information of women who were pregnant at the time of the survey, are presented in Fig. 2. This figure illustrates the association between unintended pregnancy and the independent factors

examined in the study. Women aged 25-34 were found to be 39% less likely (AOR = 0.61, 95% CI: 0.55-0.67, p < 0.001), and those aged 35-49 were 23% less likely (AOR = 0.77, 95% CI: 0.65-0.91, p < 0.002) to have an unintended pregnancy compared to women aged 15-24. This may be because younger women (15-24 years) often have lower reproductive awareness, irregular menstrual cycles, and lower contraceptive use, increasing their risk of unintended pregnancy. In contrast, older women (25-49 years) typically have more knowledge and access to contraception, reducing their risk. However, some older women who already have children may still experience unintended pregnancies due to contraceptive failure or being less strict about using birth control. Place of residence (i.e., rural, and urban) does not show any statistically significant association with unintended pregnancy. Women's education played a significant role in unintended pregnancy. Women with higher education were 21% more likely (AOR = 1.21; 95% CI: 1.02-1.43; p < 0.024), those with secondary education were 20% more likely (AOR = 1.20; 95% CI: 1.09-1.33; p < 0.001), and those with primary education were 11% more likely (AOR = 1.11; 95% CI: 0.99-1.24; p < 0.070) to have an unintended pregnancy compared to women with no education. Typically, educated women have better knowledge of contraception, family planning, and reproductive health, which should reduce unintended pregnancies. However, this study found that more educated women had higher rates of unintended pregnancy. This could be because they tend to delay childbirth for career or personal reasons, making any unplanned pregnancy more noticeable. In terms of caste, women from Scheduled Tribes (ST) were 35% less likely, Other Backward Classes (OBC) were 5% less likely, and general/other categories were 2% less likely to have an unintended pregnancy compared to Scheduled Caste (SC) women. Regarding religion, Muslim women were 9% more likely to have an unintended pregnancy than Hindu women (AOR = 1.09; 95% CI: 0.99-1.20; p < 0.076), while Christian women were 25% less likely and women from other religions were 5% less likely. However, the associations for Muslims and other religions were not statistically significant. Differences in unintended pregnancy rates across caste and religious groups may be influenced by social norms, cultural practices, and access to contraception. For instance, higher unintended pregnancy rates among Muslim women could be due to lower contraceptive use or religious beliefs that limit family planning. In contrast, Christian and other religious groups may have lower unintended pregnancy rates due to better health awareness and more proactive use of contraception. Women from wealthier backgrounds were less likely to experience unintended pregnancy. Those in the richest class were 31% less likely (AOR = 0.69; 95% CI: 0.58-0.81; p < 0.001), the richer class was 17% less likely (AOR = 0.83; 95% CI: 0.72-0.95; p < 0.005), and the middle class was 16% less likely (AOR = 0.84; 95% CI: 0.75-0.94; p < 0.003) compared to the poorest group. However, the poorer class did not show a significant difference (AOR = 0.99; 95% CI: 0.90-1.09; p < 0.818). This trend suggests that as a woman's financial status improves the chances of unintended pregnancy decrease. Economic status does not directly impact fertility, but financial stability allows better access to healthcare and family planning services. Wealthier women are more likely to use contraception, receive proper healthcare, and have higher education levels, all of which help prevent unintended pregnancies. In contrast, poorer women may face barriers to accessing family planning resources, leading to higher rates of unintended pregnancy. Women living in households with more than four members were 36% more likely to experience unintended pregnancy compared to those in smaller households (AOR=1.36; 95% CI: 1.25-1.47; p<0.001). Additionally, women from families with 1-2 children were 35% more likely (AOR=1.35; 95% CI: 1.22-1.50; p<0.001) and those with more than two children were 44% more likely (AOR=1.44; 95% CI: 1.24-1.68; p<0.001) to have an unintended pregnancy compared to women with no children. This suggests that larger families may experience social pressure to have more children, which can shape reproductive choices.

DISCUSSION

The findings of this study underscore the persistent challenge of unintended pregnancies in India, particularly in socioeconomically disadvantaged states such as Uttar Pradesh (UP) and Bihar. These states, characterized by high poverty, low educational attainment, early marriage, and limited healthcare access, exhibit a disproportionately high prevalence of unintended pregnancies compared to national averages. This aligns with broader trends observed in low-resource settings globally, where structural inequities amplify reproductive health disparities [14,19]. The strong association between socioeconomic status and unintended pregnancy highlights systemic inequities. Women from lower wealth quintiles, rural areas, and those with limited education face heightened risks, reflecting gaps in contraceptive access and reproductive autonomy [5, 6,14]. Educational attainment emerged as a critical protective factor, with uneducated or minimally educated women experiencing significantly higher unintended pregnancy rates. Education empowers women to navigate family planning decisions, a pattern consistent across studies in India and sub-Saharan Africa [5, 6,23].

Advanced maternal age (35–49 years) was linked to increased unintended pregnancies, driven by misconceptions about declining fertility and reduced contraceptive adherence. Older women often discontinue contraceptives due to perceived health risks or inadequate counselling, a trend documented in South Asia and Africa [24–26]. This underscores the need for targeted counselling to address age-specific contraceptive needs and dispel fertility myths. Rural residence remained a significant predictor, reflecting systemic barriers such as inadequate healthcare infrastructure, cultural stigma around contraception, and

limited provider training [27–30]. In Bihar and UP, where rural populations dominate, community norms often prioritize early marriage and high fertility, further restricting reproductive agency [21,22]. Additionally, intersecting identities such as caste and religion shaped outcomes, with Muslim women reporting higher unintended pregnancy rates than Hindu women, possibly due to cultural preferences for larger families or differing contraceptive attitudes [6, 31].The wealth gradient in unintended pregnancy prevalence highlights economic barriers to healthcare access. Women from the poorest households faced the highest risks, emphasizing how poverty exacerbates unmet contraceptive needs and limits access to quality services [32]. Conversely, wealthier women benefit from greater health literacy and resources, enabling informed reproductive choices [6, 32]. To address these disparities, targeted interventions must prioritize rural and marginalized communities. Expanding access to affordable contraceptives, coupled with community-based education programs, can mitigate misinformation and cultural barriers [22,28]. Integrating reproductive health services into primary care and training providers to address age-specific concerns are critical steps [25, 26]. Empowering women through education and economic initiatives, as advocated in national surveys and global frameworks, remains vital to enhancing reproductive autonomy [6, 14, 32].

CONCLUSIONS

Unintended pregnancy is a pressing public health issue in India, with significant associations with socio-demographic factors such as age, education, wealth, and rural residence. Addressing these disparities through targeted interventions, improved access to contraception, and comprehensive sexual education can help reduce the burden of unintended pregnancies and improve maternal and child health outcomes.

The study findings strongly underscore the need for significant improvement in the access to contraception methods and family planning information in the quest to considerably reduce unintended pregnancies in the entire country.

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