Effect of contraception uptake on pregnancy outcomes among young women: evidence from the Indian Demographic Health Surveys

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Abstract

Background: Several risk factors contributing to pregnancy outcomes among young women have been witnessed. Little is known about the impact of contraception on pregnancy outcomes in the Indian context. Thus, this paper aimed to examine the effect of type of contraception uptake on pregnancy outcomes among young married women.

Methods: Data were extracted from the 2015-16 and 2019-21 National Family Health Survey datasets. The main outcome measure was pregnancy outcomes (live birth, abortion, miscarriage and stillbirth). Type of contraception uptake (no contraception, short-acting hormonal contraception, long-acting reversible contraception and permanent methods) was the key exposure variable. To fulfil the study objective, cross-tabulations, chi-squared tests, and multinomial logistic regressions were employed.

Results: During 2015-16 – 2019-21, the prevalence of live birth declined by 5.74%, whereas the proportion of miscarriage, abortion and stillbirth increased by 4.87%, 0.79% and 0.06%, respectively. Results of multinomial models revealed that the association between type of contraception uptake and pregnancy outcomes were strongly significant, even after adjusting for other potential correlates. Besides, respondent's age group, body mass index, height, haemoglobin level, parity, antenatal visits, place and mode of delivery, desire for more children, pregnancy intentions, distance to a nearest health facility, education level, social group, wealth quintile place and region of residence were also significantly associated with pregnancy outcomes among young married women.

Conclusions: Findings from this paper reinforced the need of the hour for implementing effective policies and multifaceted programmatic interventions towards ensuring access to effective contraception and enhancing the quality of family planning services that could help to achieve the best possible pregnancy outcomes among young women.

Keywords: Young women; contraception; miscarriage; abortion; stillbirth; pregnancy outcomes; India

Introduction

Young women are particularly vulnerable to the high prevalence of pregnancy and childbirth complications, often resulting in poor reproductive health and Adverse Pregnancy Outcomes (APOs). Childbearing during young age is not only associated with an increased risk of APOs but also has a negative impact on the future well-being of mothers and infants (Olausson et al., 2001; UNICEF, 2008). It is estimated that about 12 million adolescents aged 15–19 years give birth in developing regions each year (WHO, 2019). Despite concerted efforts, adolescent pregnancy is still rampant and one of the most serious public health threats to young women consisting of a range of unfavourable events involving pregnancy and childbirth in many low- and middle-income countries, where both accessibility and utilization of healthcare services are limited. Although India has made considerable progress in reducing the risk of APOs among reproductive-age women during the past few decades, the 2019-21 National Family Health Survey (NFHS) reported that nearly 10% of young women had experienced Non-Live Births (NLBs) or APOs (stillbirth, miscarriage, and abortion) in five years preceding the survey, compared with 4.4% in 2015-16 (IIPS & ICF, 2021). Thus, there is a need for an immediate endeavour to minimize worse pregnancy events for those young women who do become pregnant.

Although several pieces of literature have investigated the effects of potential factors on APOs rather than contraception in India and elsewhere (Doke et al., 2012; Ganchimeg et al., 2014; Padhi et al., 2015; Patra, 2016; Dandona et al., 2017; Patel et al., 2018; Patel et al., 2021), the role of contraception associating with APOs has largely been understudied (Hale et al., 2021). The scarcity of this kind of research is imperative, and hardly any evidence has inclined towards addressing this research gap, especially in the Indian context. To shed light on this, this paper aimed to examine the association between type of contraception uptake and pregnancy outcomes (live birth, stillbirth, abortion and miscarriage) among young married women, adjusting for many potential confounding factors using the nationally representative 2015-16 and 2019-21 NFHS datasets. Towards the end, the findings of this paper would contribute to the scanty literature on this subject and identify the uninhabited dimension of contraception behaviour in the follow-up of pregnancy outcomes. This paper may also have gripped significant interest in the Maternal Child Health–Family Planning (MCH-FP) programme planners for designing and implementing effective policies and targeted health interventions to improve the best possible pregnancy outcomes among young women.

Materials and methods

Data

Data used in the present analyses were derived from the latest two waves of the National Family Health Survey (NFHS), conducted in 2015-16 and 2019-21, respectively (IIPS & ICF, 2017; IIPS & ICF, 2021). NFHS is a cross-sectional survey conducted in line with the Demographic and Health Survey (DHS). A two-stage stratified cluster sampling method was adopted by NFHS for the collection of the sample, comprising over 99% of India's population. A detailed description of the sampling techniques and survey procedures, including methodology, data processing and questionnaires, can also be mentioned in the NFHS survey report (IIPS & ICF, 2017; IIPS & ICF, 2021). The primary objective of each NFHS wave is to provide reliable and up-to-date information on key aspects of demographic, health and nutrition-related parameters at the district, state/union territory (UT), and national levels. For the first time in the history of NFHS, NFHS-4 and 5 provide the district-level various indicators, such as fertility, mortality, FP, maternal and child health, child immunization, anthropometric measurements, anaemia, fertility preference, hypertension, blood glucose levels etc. (IIPS & ICF, 2017; IIPS & ICF, 2021).

Event of interest

To reach the specific goal of this study, pregnancy outcomes was considered as the main event of interest. Therefore, it was coded as a categorical variable using the following last pregnancy outcomes categorized into four possible groups: (1) live birth, (2) abortion, (3) miscarriage and (4) stillbirth.

Explanatory variable

Type of contraception uptake was considered as the key exposure variable of interest in this paper. Users who had not practised any contraception at the time of the survey were also categorized as no contraception uptake. However, young women responding to their various types of contraception uptake mentioned above were further clubbed into four categories — no contraception, SARCs, LARCs and PMs.

Control variables

A set of demographic and socio-economic variables were considered as correlates in the analyses of the present study. The variables included in the analyses were: place of residence (urban/rural); level of education (illiterate, primary, secondary and higher); religion (Hindu,

Muslim, Christian and Others); caste (Scheduled Castes/Tribes [SC/ST], Other Backward Castes [OBC], and others); wealth quintile (poorest, poor, middle, richer and richest); maternal age (15-19/20-24 years); Body Mass Index (BMI; kg/m2) [thin (<18.5), normal (18.5–24.9) and overweight and obese (≥25.0)]; height (<145 cm/≥145 cm); haemoglobin level (non-anaemic/anaemic (10.0-12.0 g/dl); number of ANC visits (<4 times/≥4 times); place of delivery (home/institution), mode of delivery (normal/C-section), parity (1, 2 and 3 or more); desire for more children (wanted soon, wanted later and wanted no more); pregnancy intentions (wanted, mistimed and unwanted); distance to health facility (no problem/minor & big problem); exposure to mass media (no/any); and region of residence (north, central, east, north-east, west and south).

Statistical approach

Bivariate analyses were performed to capture the distributional nature and the prevalence of associations between the type of pregnancy outcome and selected demographic and socio-economic characteristics of young married women. In this approach, variables that were significantly associated with the outcome of interest were included in the regression models. To access the effect of type of contraception uptake on pregnancy outcomes among young married women, a series of multinomial logistic regression models were employed using 2015-16 and 2019-21 NFHS data. The analyses were adjusted for other potential correlates, including demographic and socio-economic characteristics.

Results

Characteristics of the respondents

Table 1 represents descriptive statistics summarizing the sample distribution of the selected study variables. With regard to type of contraception uptake, the proportion of users who adopted SACs increased by 11.2% (from 17.5% to 28.7%), followed by LARCs (3.3%, from 2.6% to 5.9%), while PMs declined slightly by 3.6% (from 17.6% to 14.2%) during 2015-16 - 2019-21. Among background characteristics, the majority of young women (over 91%) were found between the ages of 20-24 years in both surveys. With respect to household's wealth status, about two-thirds of women were in the lowest three wealth quintiles, whereas both the richer and richest quintiles stayed almost stable between surveys.

Pregnancy outcomes and type of contraception uptake

Figure 1 shows the prevalence of pregnancy outcomes among young married women in India, considering their last pregnancy ended in live and NLBs during 2015-16 - 2019-21. Users who did not adopt contraception declined by only 1.2% points, from 68.98% in 2015-16 to 68.8% in 2019-21, respectively.

Pregnancy outcomes by selected study variables.

Table 2 depicts the results of bivariate analyses showing the differentials in pregnancy outcomes among young married women in five years preceding the survey by their demographic and socio-economic characteristics. From the table, it was found that a positive change in the prevalence of APOs, as the occurrence of miscarriage was five-fold increased (4.87% points, from 2.27% to 7.14%), followed by abortion (0.79% points, from 1.47% to 2.26%) and stillbirth (0.06% points, from 0.65% to 0.71%), respectively.

Regarding the type of contraception uptake, the prevalence of live birth went down, whereas the rate of abortion, miscarriage and stillbirth increased slowly among young users who had never used any contraception, followed by SACs and PMs over time. Similar patterns were also observed with respect to respondent's height and haemoglobin level. Furthermore, the occurrence of adverse consequences of pregnancy, mostly abortion and miscarriage, were considerably higher among women aged 20-24 years, BMI's 18.5–24.9 and ≥25.0 kg/m^2, height ≥145 cm, experienced non-anaemic, delivered institutional birth, children in 1st and 2nd parity, desired to want another child later or no more, unwanted pregnancy intention, no problem with distance to a health facility, resided in urban settings and belonged to Hindu and OBC communities during 2015-16 – 2019-21.

Abortion

The type of contraception uptake was significantly associated with abortion, even after controlling for a range of potential correlates, suggesting that the strength of association remained the same and highly valuable in explaining the differentials in the likelihood of the risk of abortion in both un/adjusted multinomial models. As unadjusted results were shown in

As illustrated in Tables 3 and 4 (unadjusted models), respondent's BMI, number of ANC visits, PoD, MoD, desire for more children, pregnancy intentions, distance to a health facility, place of residence, education level, religion, caste, wealth quintile and region of residence were strongly associated with the risk of abortion. Regarding wealth status, the adjusted results

found that the wealth quintile was strongly associated with abortion. Young women from the middle (AOR=1.78, CI: 1.39-2.29; Table 3) and richer (AOR=1.76, CI: 1.30-2.40; Table 4) quintiles were relatively more likely to end with abortion compared with those in the poorest quintile. Unlike unadjusted models, factors in the adjusted models, such as caste and pregnancy intentions in NFHS-4, whereas BMI, height, PoD, MoD, parity, desire for more children and pregnancy intentions in NFHS-5, did not find any significant association on the risk of abortion.

Miscarriage

Tables 3 and 4 demonstrate that type of contraception uptake remained a key significant factor on the risk of miscarriage, even after adjusting for a range of correlates. Thus, both un/adjusted results suggested that the strength of association between type of contraception uptake and miscarriage were strongly commendable and significantly increased by other potential correlates.

Among the background characteristics, respondents' age group, BMI, number of ANC visits, desire for more children, level of education, religion, wealth quintile and region of residence were strongly associated with miscarriage in the unadjusted models (shown in Tables 3 and 4). However, the adjusted model (Table 3) found that women aged 20-24 years (AOR=2.12, CI: 1.65-2.74), BMI ≥25.0 kg/m^2 (AOR=1.41, CI: 1.15-1.73), hight ≥145 cm (AOR=1.18, CI: 0.98-1.41), C-section (AOR=1.10, CI: 0.94-1.28), wanted no more child (AOR=4.89, CI: 0.85-28.13), attended primary education (AOR=1.25, CI: 1.04-1.51), Muslims (AOR=1.15, CI: 0.98-1.36) and belonged to the richer quintile (AOR=1.31, CI: 1.05-1.62) were significantly associated with a higher risk of miscarriage compared with respondents aged 15–19 years, BMI <18.5 kg/m^2, hight >145 cm, wanted child sooner, illiterate, belonged to Hindu and poorest quintile. In contrast, the adjusted results confirmed that respondents who attended ≥4 ANC visits (AOR=0.81, CI: 0.71-0.91), 2nd parity (AOR=0.47, CI: 0.42-0.54), highly educated (AOR=0.64, CI: 0.49-0.84), and resided in the Eastern region (AOR=0.82, CI: 0.69-0.94) had a lower risk of miscarriage than those who received <4 ANC visits, 1st parity, non-educated and resided in the Northern region.

Stillbirth

Unlike Table 3, the un/adjusted results in Table 4 revealed that the type of contraception uptake was strongly associated with stillbirth, even after controlling for a range of potential correlates. As unadjusted results were shown in Table 3, It is worth mentioning that no significant

association was observed between the type of contraception uptake and stillbirth in the adjusted model. In Table 4, the unadjusted results found that compared with no contraceptive uptake, the risk of stillbirth was significantly lower among users who received SACs (UOR: 0.29, CI: 0.21-0.40). Conversely, the adjusted results highlighted that users of PMs (AOR: 0.32, CI: 0.09-1.10) were a lower likelihood of experiencing stillbirth compared with no contraception uptake.

Discussion

The present study made a first attempt to investigate the association between type of contraception uptake and pregnancy outcomes among young married women using the latest 2015-16 and 2019-21 NFHS datasets. The results indicated that albeit the nationwide prevalence of live birth was more prevalent than NLBs among young women, the proportion of abortion, miscarriage and stillbirth increased slightly from 2015-16 to 2019-21. Interestingly, the key finding of this paper showed a strongly significant association between type of contraception uptake and pregnancy outcomes, even after adjusting for a range of potential correlates. The results found that, in both NFHS waves, respondents who did not use contraception had a higher risk of all three types of APOs compared with those who adopted any kind of contraception. This could be elucidated by the fact that not using contraception has resulted in too early, too many and too close births, which may increase worse pregnancy outcomes (WHO, 2007). However, the findings of the present study are imperative because previous research linking the type of contraception uptake to pregnancy outcomes were scarce in the scant literature in the Indian context, and it flags a perplexity in assessing the current findings in light of the similar conclusions in the existing literature.

In spite of socio-economic and demographic factors, the importance of contraception uptake in pregnancy outcomes cannot be ruled out entirely. A few studies have found that pregnancy during early age is associated with an elevated risk for APOs (Chen et al., 2007; Ganchimeg et al., 2014). The study findings clearly affirmed that haemoglobin level, BMI and PoD were associated with all three types of APOs, and the results are in accordance with the findings from similar studies (Dandona et al., 2017; Patel et al., 2021). Also, the present study indicated that higher-educated women had significantly lesser chances of facing miscarriage and abortion. Disagreeing with the results, findings from earlier studies revealed that the likelihood of stillbirth and abortion were higher among well-educated women (Ganchimeg et al., 2014; Patra, 2016). Hence, avoiding early childbearing may allow young women to complete their

education to get the benefits of employment opportunities that might contribute to the India's economic growth by reducing maternal and child health expenditure.

Conclusion

In India, the prevalence of miscarriage was more prevalent among young married women as compared to abortion and stillbirth during 2015-16 - 2019-21. The results revealed that the type of contraception uptake was strongly associated with pregnancy outcomes, even after adjusting for a range of potential correlates. A concerted effort should be taken to emphasize the importance of scaling up the utilization of high-quality FP services in a timely manner, and proper counselling and assistance of various maternity services follow up with a special emphasis on adequate maternal nutritional intake with a desire to lowering the risk of unintended pregnancy and APOs amongst young women. In addition, health planners and policymakers should primarily focus on designing and implementing effective policies and programmes to address poor reproductive health outcomes and to ensure optimal birth spacing that would undoubtedly be regarded as the most effective mechanism in reducing undesirable outcomes of pregnancy among young women, especially in the rural and remote areas with low resource settings in India.

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