




Association between the place of abortion and post-abortion contraceptive adoption and continuation: the case of India

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Abstract: *The unmet need for contraception is documented as a significant determinant of unintended pregnancies and high number of induced abortions. The period immediately after an abortion is recognised as a unique opportunity to offer contraceptive services. This paper explores the association between place of abortion and women's post-abortion contraceptive behaviour. The reproductive calendar data from the National Family Health Survey (NFHS-4) (2015–16) was used for this study. Multinomial logistic regression models were used to understand factors associated with post-abortion method choices. Single decrement life-tables were built to examine rates of contraceptive discontinuation and proportional hazard models were employed to examine probability and correlates of method discontinuation. About 20% of women who underwent an abortion adopted a contraceptive method by the end of one month following an abortion. The decision to choose methods like sterilisation or intrauterine contraceptive devices (IUCDs) was associated with the place of abortion, past contraceptive behaviour, number and sex of surviving children at the time of abortion, mass media exposure, and time of the abortion. Compared to women who underwent an abortion at private health facilities, women who sought abortion at public health facilities were more likely to choose permanent methods or IUCDs. Furthermore, women who opted for an IUCD were less likely to discontinue the method compared to those using short-acting modern methods. The lack of post-abortion contraceptive choices for women is evident in the low uptake of post-abortion contraceptives in private facilities and the predominant promotion of permanent methods and IUCDs in public health facilities. DOI: 10.1080/26410397.2021.1966983*

Keywords: India, family planning, abortion, place of abortion, IUCD, permanent method, traditional methods, health facility

Introduction

The unmet need for contraception is documented as a significant proximate determinant of unintended pregnancies and high number of induced abortions.^{1–4} In low- and middle-income countries (LMIC) in 2019, an estimated 218 million women had an unmet need for modern contraception and about half (49%) of all pregnancies in the region were unintended.⁵ Recent estimates show that about 40% of unintended pregnancies that year ended in abortions.⁶ A similar pattern is evident in India. In 2015, around half of the 48.1 million pregnancies were estimated to be unintended and induced abortion accounted for one-third (15.6 million) of all pregnancies. This translates to 47 abortions per 1000 women in a year.³

The period immediately after an abortion is recognised as a unique opportunity to offer family planning services. Women start ovulating as early as six days after an abortion and are at risk of getting pregnant again.^{7,8} It is also documented that women with abortion histories are more likely to have recurrent abortions.⁹ Family planning interventions incorporated into post-abortion care (PAC) have been regarded as integral components of quality abortion services since the 1990s.^{10,11} Evidence shows, however, that PAC services mostly focus on emergency treatment¹² and neglect family planning counselling.^{12–15} A few regional studies from India also found inadequacies in post-abortion services with limited contraceptive counselling.^{16,17}

The uptake of post-abortion contraceptives in India is far from universal.^{18,19} Among those who do opt for them, permanent methods, IUCDs and pills are the most preferred contraceptive methods after abortions.²⁰ Moreover, the uptake of contraception and choice of contraceptive methods differ by the place and method of abortion.²¹ Women who undergo surgical abortions have higher chances of accepting contraceptive methods as they are already in the health facility. In contrast, women who undergo medical abortions are significantly less likely to adopt any kind of contraception in the month following their abortion.¹⁸

The majority of studies researching the adoption of contraception immediately after an abortion in India are small scale, focussing only on certain geographies.^{16–18,21} To the best of the authors' knowledge, the only national level study that discussed the post-abortion adoption of contraception utilising the National Family Health Survey (NFHS-3) (2005–2006) data was published in 2012 by Zavier and Padmadas.¹⁹ In the last 15 years, the Indian government has focussed on making family planning services an integral part of post-abortion care in the country. The Ministry of Health and Family Welfare (MoHFW) released training and service delivery guidelines for Comprehensive Abortion Care (CAC) and strategic guidelines for reproductive, maternal, newborn, child, and adolescent health that stipulate provisions of contraceptive counselling, services, and post-abortion follow-up visits to reinforce contraceptive use. Furthermore, the Government of India launched Postpartum IUCD (PPIUCD) services in the year 2000 in selected states, which were universalised across all states by the year 2010.^{22,23} Largely, government programmes are more extensively executed in the public health sector as compared to private health facilities. It would therefore be interesting to understand the role of various factors with a focus on the place of abortion in choosing a contraceptive method after abortion. This paper further examined discontinuation rates of reversible methods adopted after an abortion and correlates of method discontinuation. Until now, this aspect has been sparingly studied. The findings from this study will enhance the understanding of the issue and help policymakers assess where focussed efforts are needed to strengthen post-abortion contraceptive services.

Materials and methods

Data

Data for this study were obtained from the NFHS-4 conducted during 2015–2016. The NFHS is a cross-sectional multi-stage household survey, similar in structure to the Demographic Health Survey. The protocol for the NFHS-4, including the survey questionnaires, was approved by the Institutional Review Board of International Institute for Population Sciences (IIPS) and the ICF. The protocol was also reviewed by the US Centers for Disease Control and Prevention (CDC). The NFHS-4 collected health, demographic, and socioeconomic information at the national, state, and district levels. Additionally, the NFHS-4 collected month by month histories of various key events such as pregnancy status, pregnancy outcomes, and contraceptive use, as well as information on the reasons for each episode of contraception discontinuation in the 60 months preceding the survey. Monthly data were recorded in a calendar matrix, consisting of rows (months) and columns (information recorded: use of contraceptive method, reason for discontinuation, etc.).²⁴ Each birth was denoted by the letter B in the month the birth took place. Further, each preceding month of pregnancy was denoted by the letter P. The termination of pregnancy in the period covered by the calendar was denoted by the letter T in the month the pregnancy was terminated. For the last termination, the type of termination was recorded with the letter M (miscarriage), A (abortion), and S (stillbirth) in the month the pregnancy was terminated. Furthermore, information on contraception was also gathered in the calendar. Code for the contraceptive method currently and continuously used since initiation by women was recorded in the row corresponding to the month of interview and in the month the method was initiated. Other episodes of contraceptive use that might have occurred in any remaining open periods in the calendar were also recorded. Open periods here refer to the months in which no code was filled in, i.e. the period between a birth and the beginning of contraceptive use or between one birth and the following pregnancy. The above information was utilised to ascertain outcome variables. The study sample consisted of women who had an abortion during the 60 months prior to the survey date and had at least a year of exposure after the abortion. Abortion in this study is defined as a voluntary termination

of pregnancy. The final sample size consisted of 5545 currently married women aged 15–49 years.

Outcome variables

The first outcome variable for this study was post-abortion contraceptive use which was grouped into four categories: permanent methods (female and male sterilisation), long-acting reversible methods (IUCD) (it is to be highlighted that the only long term reversible method available in India is the IUCD, and therefore implants are not included under this category); short-acting modern methods (injectables, pills, condom, diaphragm, foam and jelly, lactational amenorrhoea method, etc.); traditional methods (rhythm, withdrawal methods, etc.) and no methods. For the regression analysis, this was recoded as 0 (no method), 1 (permanent or IUCD - by combining sterilisation and IUCD), 2 (short-acting modern methods), and 3 (traditional methods). The second outcome variable was the time between adopting contraception after an abortion and the discontinuation of the method.

Predictor variables

The main predictor variable for the regression analysis was the place where the abortion was sought (public facility, private facility, and home/others). Public health facilities include government/municipal hospital, *vaidya/hakim*/homeopath (AYUSH - Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy), government dispensary/clinic, Urban Health Centre (UHC)/Urban Health Post (UHP)/Urban Family Welfare Centre (UFWC), Community Health Centre (CHC)/rural hospital/Block Primary Health Centre (PHC), Primary Health Centre (PHC)/Additional Primary Health Centre (APHC), sub-centre, government mobile clinic, other public health facilities, NGO or trust hospital/clinic. Private health facilities include private hospital/clinic, *vaidya/hakim*/homeopath (AYUSH), dispensary/clinic, other private health facilities; and home/others include home and elsewhere. Home/others mainly include medical method of abortion. It is worth noting that information is not available as to whether or not the health facility is legally approved for providing abortion.

All regression models were controlled for a wide range of socio-economic and demographic variables, including: age at abortion (in years); respondent's education (no education, completed primary education, completed secondary

education, completed higher secondary education or more); caste/ethnicity of the head of household (Scheduled Tribes [STs], Scheduled Castes [SCs], Other Backward Classes [OBCs] and Others); religion of the head of household (Hindu, Muslim and Others); number and sex of surviving children at the time of abortion (no/single child; two children - one son and one daughter; two children, both sons; two children, both daughters; more than three children, any sex); respondent's exposure to mass media (yes, no); wealth quintile (poorest, poorer, middle, richer and richest); place of residence (urban, rural); region of residence in the country (central, east, north-east, west, south, and north); time of the abortion (first trimester and second trimester or third trimester). Apart from these variables, the multinomial logistic (MNL) regression model used pre-abortion contraceptive use (categorised as modern spacing methods, traditional methods, and not used any contraception) as a predictor variable. Additionally, in proportional hazard models, post-abortion contraceptive use was taken into account, which included short-acting modern methods, IUCD, and traditional methods.

Analytical strategy

Bivariate analyses were carried out using simple cross-tabulation and chi-square tests. The generalised form of the logistic regression, MNL model was employed to understand the factors associated with post-abortion contraceptive use (categorised as permanent methods or IUCD, short-acting modern methods, traditional methods, and no method). Results have been presented in the form of relative risk ratios (RRRs) along with the significance levels. RRRs were interpreted as the expected risks of not using any method with a unit change in a variable, given that other correlates in the model were held constant. In the MNL model, it was assumed that the log-odds of each response followed a linear model²⁵

$$\eta_{ij} = \log \frac{\pi_{ij}}{\pi_{1j}} = \alpha_j + x_i \beta_j + e_{ij}$$

where α_j is a constant, x_i is the vector of explanatory variables describing observation i , β_j is a vector of regression coefficients for explanatory variable j and e_{ij} is the error term.

Single decrement life tables were constructed to examine the rates of contraceptive discontinuation after abortion. The discontinuation rate was defined as the percentage of women who discontinued the method post-abortion by the duration since the adoption of method (one month, three months, six months, and 12 months). Proportional hazard models were used to examine the probability of discontinuation and its correlates among women who adopted any short-acting modern or traditional methods of contraception. The proportional hazard model was used as it considers the censored cases, because not all women may have experienced the event by the end of the study.^{25,26} The dependent variable in this model was the time between when a spacing method was adopted to its discontinuation. The survival time t was considered from the time a spacing method was adopted to the time it was discontinued or, in case the woman was still using the method, the time of interview. The proportional hazard model for an individual i with a vector of covariates in X , the hazard rate (here discontinuation rate) at time t is given by:

$$h_i(t_i, X_i) = h_0(t_i) \exp(b_i X_i)$$

These models were controlled for the pertinent socioeconomic and demographic covariates. All the statistical analyses were performed in Stata 13 statistical package.²⁷ All the analyses have been weighted using available sampling weights in the dataset to account for survey design.

Results

Sociodemographic characteristics of women who underwent abortion

The mean age of women at abortion was 26.6 years (Table 1). More than half of the women had completed secondary education. The majority of the women were Hindu and around 42% of women belonged to OBCs. Almost half of the women had no/single child. A quarter of them belonged to the richest wealth quintile. Fifty-eight percent were from rural areas and 26% were from the central region of India. A majority of women underwent abortion in the first trimester. Three-fourths of them did not use any contraception before the abortion. Also, more than half of the women had the abortion in a private health facility.

Uptake of contraception after abortion

The majority of the women aged 15–49 years (80%) did not use any contraception by the end of the first month after abortion (Figure 1). The proportion of women who used any contraception increased in the following months, but the increase was sluggish. By the end of 12 months, more than half the women reported not having used any contraceptive method. There was a clear inclination towards short-acting modern methods followed by traditional methods among those who were using contraceptives. To elaborate, by the end of the first month, 8.8% of the women used short-acting modern methods while around 4.2% used permanent methods, 5.2% used traditional methods and 1.6% used IUCD. By the end of 12 months, these figures rose to 25.7%, 7.3%, 11.8%, and 3.7%, respectively.

There was an increase in the proportion of contraceptive users from 20% (by the end of the first month) to 36% (by the end of the third month) and beyond that the progress was slower. It is apparent from the results that the majority of the women who wanted to use any contraceptive method after the abortion, used it within three months of the abortion and subsequently only a slight increase was observed. For instance, the percentage of short-acting modern contraceptive users doubled between the first and third months – from 8.8% to 18.9%. An addition of just 6.8% was observed in the next nine months. Similarly, during this period, increase of only 2.4% and 1.3% were observed in traditional methods and IUCD, respectively.

Post-abortion uptake of contraception by place of abortion

Uptake of permanent method of contraception and IUCD was considerably higher among women who underwent an abortion in a public health facility irrespective of the months lapsed after the abortion (Table 2). Further, the percentage of women using traditional methods of contraception was considerably higher (almost twice) among women who underwent the abortion at home/other places than those who opted for private or public health facilities. The percentage of women using short-acting modern methods after the abortion was also higher among women who underwent an abortion at home/other places, whereas the

Table 1. Sample characteristics of women who underwent an abortion in the five years preceding the survey, NFHS-4, 2015–2016

Background characteristics	Percentage/Mean (SD)	N
Age at abortion	26.6 (5.7)	5546
Education		
No education	18.8	1129
Primary	12.6	690
Secondary	53.7	2994
Higher	15.0	733
Caste		
Scheduled Castes	20.7	989
Scheduled Tribes	5.9	609
Other Backward Classes	42.5	2215
Others	30.9	1733
Religion		
Muslim	15.2	867
Hindu	79.7	4177
Others	5.2	502
Surviving children at the time of abortion		
No child/single child	52.4	2663
Two children- 1 son and 1 daughter	13.4	768
Two children- both sons	7.1	443
Two children- both daughters	5.3	269
Three or more children- any sex	21.7	1403
Mass media exposure		
No	13.4	824
Yes	86.6	4722
Wealth quintile		
Poorest	12.7	739
Poorer	17.1	1095
Middle	20.8	1301
Richer	24.6	1244
Richest	25.0	1167
Place of residence		
Rural	58.2	3643
Urban	41.8	1903

(Continued)

Table 1. Continued		
Background characteristics	Percentage/Mean (SD)	N
Region		
North	11.6	922
Central	26.1	1585
East	22.8	936
Northeast	5.7	1082
West	12.5	348
South	21.4	673
Time of abortion		
First trimester	91.9	5143
Second or third trimester	8.1	403
Pre-abortion contraceptive use		
Did not use	74.3	4197
Modern spacing	16.9	799
Traditional spacing	8.8	550
Place of abortion		
Home/others	23.9	1399
Public	21.5	1469
Private	54.6	2677
Total	100.0	5546

Figure 1. Cumulative percentages of currently married women aged 15–49 years who underwent an abortion in the past five years by their monthly/3 monthly/6 monthly contraception use after abortion, India, NFHS-4, 2015–2016

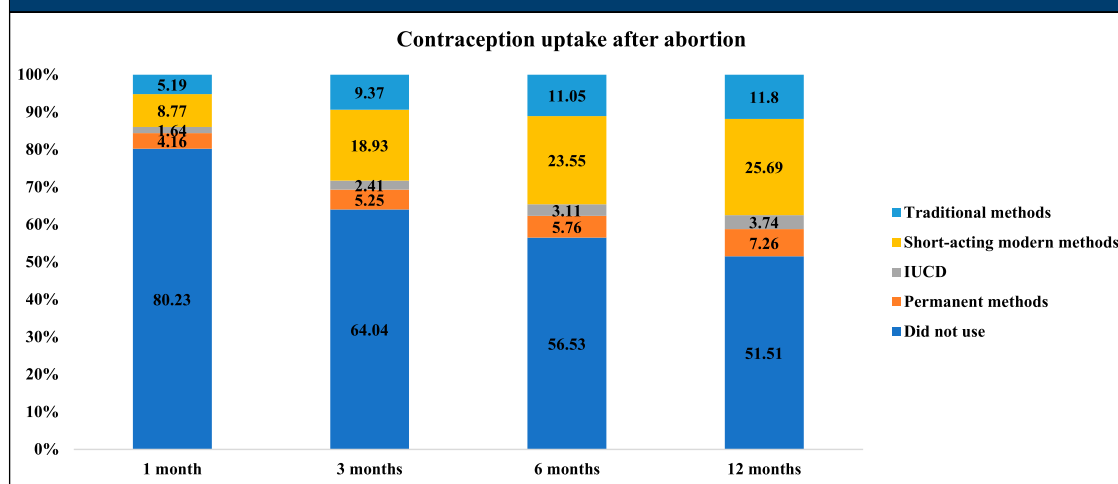


Table 2. Cumulative percentage of currently married women aged 15–49 years who underwent an abortion in five years preceding the survey by their monthly/3 monthly/6 monthly contraception use after abortion, according to the place where the abortion was conducted, India, NFHS-4, 2015–2016

Month 1						
Place of abortion	Did not use	Permanent methods	IUCD	Short-acting modern methods	Traditional methods	N
Public	80.9	6.8	2.2	6.1	4.0	1469
Private	81.3	4.3	1.9	8.5	3.9	2677
Home/Others	77.1	1.4	0.6	11.7	9.1	1399
Month 3						
Public	64.7	8.2	3.0	17.3	6.7	1469
Private	67.4	5.1	2.5	17.4	7.6	2677
Home/Others	55.6	2.9	1.8	23.9	15.8	1399
Month 6						
Public	56.5	9.0	3.3	22.8	8.3	1469
Private	60.0	5.5	3.5	21.7	9.3	2677
Home/Others	48.7	3.4	1.9	28.4	17.5	1399
Month 12						
Public	49.7	10.7	4.7	25.7	9.2	1469
Private	55.8	6.8	3.9	23.9	9.6	2677
Home/Others	43.3	5.3	2.4	29.9	19.1	1399

differences across public and private health facilities were not considerable. The results, however, connote for a scrutiny using multivariate analysis.

Factors associated with the uptake of post-abortion contraceptive methods

The potential association of the place of abortion with post-abortion contraceptive use was further examined using MNL regression models after controlling for socioeconomic and demographic characteristics. Results are presented in terms of RRRs and 95% confidence intervals (CIs) (Table 3). The educational status of women had no significant association with the uptake of permanent methods or IUCD and traditional methods post-abortion; nevertheless, it was positively associated with the uptake of short-acting modern methods. Caste was also not a significant factor affecting the use of contraception, barring ST women who were

less likely to use short-acting modern methods (RRR: 0.67). Results further suggested that compared to Muslim women, Hindu women (RRR: 3.27) and those belonging to other religions (RRR: 2.28) were more likely to use permanent methods and IUCD. Notably, compared to Muslim women the use of short-acting modern methods was low among women from other religions (RRR: 0.62).

The likelihood of method use increased significantly for high parity women and those with a greater number of living sons. For instance, the uptake of permanent methods and IUCD was 10 times higher among women who had three or more children of both sexes. It was almost eight times higher among women with two children and with at least one son. However, if the women had two daughters, the chances of using permanent methods or IUCD were two-fold higher

Table 3. Association of the socioeconomic and demographic characteristics with post-abortion contraceptive uptake using multinomial logistic regression, NFHS-4, 2015–2016

Background characteristics	Relative risk ratios (N = 5, 545)		
	Permanent or IUCD vs None	Short-acting modern methods vs None	Traditional methods vs None
Age at abortion	0.99 [0.97–1.01]	0.99 [0.97–1]	1.04*** [1.02–1.06]
Education (No education [®])			
Primary	1.03 [0.73–1.44]	1.3* [0.99–1.7]	1.21 [0.87–1.68]
Secondary	1.14 [0.85–1.53]	1.43*** [1.13–1.8]	1.21 [0.91–1.61]
Higher	0.97 [0.63–1.5]	1.43** [1.04–1.95]	0.99 [0.65–1.5]
Caste (Scheduled Caste [®])			
Scheduled Tribe	0.81 [0.54–1.21]	0.67* [0.5–0.9]	0.8 [0.54–1.19]
Other Backward Classes	0.89 [0.68–1.16]	0.86 [0.7–1.07]	0.93 [0.71–1.23]
Others	0.89 [0.66–1.19]	0.94 [0.75–1.17]	0.91 [0.68–1.23]
Religion (Muslim [®])			
Hindu	3.27*** [2.28–4.68]	0.92 [0.75–1.14]	1.25 [0.94–1.64]
Others	2.28*** [1.36–3.82]	0.62** [0.44–0.86]	0.69 [0.43–1.11]
Surviving children at the time of abortion (No child/single child [®])			
Two children – 1 son and 1 daughter	8.38*** [6.16–11.41]	2.13*** [1.7–2.66]	1.86*** [1.38–2.52]
Two children – both sons	8.74*** [6.08–12.56]	2.39*** [1.82–3.14]	1.98*** [1.36–2.87]
Two children – both daughters	2.64*** [1.6–4.35]	1.24 [0.88–1.75]	1.65** [1.07–2.53]
Three or more children – any sex	10.59*** [7.54–14.86]	2.28*** [1.8–2.9]	2.41*** [1.78–3.27]
Mass media exposure (No [®])			
Yes	1.43** [1.04–1.98]	1.19 [0.93–1.51]	1.1 [0.82–1.48]
Wealth quintile (Poorest [®])			
Poorer	1.19 [0.84–1.68]	1.06 [0.81–1.38]	1.15 [0.82–1.59]
Middle	1.12 [0.77–1.62]	1.09 [0.83–1.45]	1.16 [0.82–1.66]
Richer	0.98 [0.65–1.48]	1.21 [0.89–1.64]	1.4* [0.95–2.05]
Richest	1.33 [0.84–2.12]	1.69*** [1.21–2.37]	1.49* [0.96–2.31]
Place of residence (Rural [®])			
Urban	1.22 [0.97–1.54]	1.08 [0.91–1.28]	0.91 [0.72–1.15]

(Continued)

compared to women who had no child or had a single child. Interestingly, mass media exposure was positively associated with the uptake of permanent methods or IUCD (RRR: 1.43) but not with short-acting modern methods. Results

further suggested that the uptake of contraception was not significantly associated with the wealth status of the women. The exception to this analysis was that women from the richest quintile were more likely to use short-acting

Table 3. Continued

Background characteristics	Relative risk ratios (N = 5, 545)		
	Permanent or IUCD vs None	Short-acting modern methods vs None	Traditional methods vs None
Region (North[®])			
Central	0.92 [0.67–1.25]	1.04 [0.83–1.31]	1.8*** [1.32–2.45]
East	1.08 [0.76–1.55]	1.51*** [1.17–1.94]	1.32 [0.92–1.89]
Northeast	0.73 [0.5–1.08]	1.57*** [1.22–2.02]	2.21*** [1.56–3.13]
West	2.33*** [1.55–3.52]	0.84 [0.6–1.18]	0.73 [0.42–1.28]
South	1.31 [0.89–1.92]	0.24*** [0.17–0.35]	0.31*** [0.17–0.55]
Time of abortion (First trimester[®])			
Second or third trimester	0.44*** [0.27–0.71]	0.61*** [0.45–0.84]	0.54** [0.35–0.85]
Pre-abortion contraceptive use (Did not use[®])			
Modern spacing methods	2.71*** [2.03–3.6]	6.32*** [5.2–7.69]	2.57*** [1.91–3.44]
Traditional methods	4.19*** [2.78–6.31]	5.08*** [3.71–6.97]	27.13*** [20.11–36.61]
Place of abortion (Private[®])			
Public	1.86*** [1.48–2.34]	1.15 [0.95–1.38]	0.97 [0.76–1.25]
Home/others	0.88 [0.68–1.15]	1.30*** [1.09–1.55]	1.62*** [1.30–2.03]

Note: Significance level * $p < 0.1$. ** $p < 0.05$. *** $p < 0.01$.

modern methods (RRRs: 1.69) and traditional methods of contraception (RRRs: 1.49).

The likelihood of women using permanent methods or IUCD was more than double among women from western India (RRR: 2.33) than those from northern regions. Furthermore, compared to women from the north, women in eastern (RRR: 1.51) and north-eastern (RRR: 1.57) regions were more likely and those from the southern region (RRR: 0.24) were less likely to use any short-acting modern methods. Similarly, women from central (RRR: 1.80) and north-eastern (RRR: 2.21) regions were more likely while women from the southern region (RRR: 0.31) were less likely to use traditional methods of contraception.

Women who underwent an abortion in the second or third trimester were almost half as likely to use any contraceptive method as those who underwent an abortion in the first trimester. Pre-abortion contraceptive history is a significant predictor of the method choice. Those who used contraception before their abortion were more likely to continue using contraception after the

abortion. This behaviour largely depended on the type of method previously used by them. For instance, women who used short-acting modern and traditional methods before their abortion were two and four times more likely to adopt permanent methods or IUCD, respectively. Furthermore, those who used short-acting and traditional methods before their abortion were five and six times more likely, respectively, to continue using those methods after their abortion.

The results suggest that place of abortion played an important role in the type of contraceptive method women adopted post-abortion. For instance, compared to women who underwent abortions at private health facilities, those who accessed public health facilities were more likely to opt for permanent methods or IUCD (RRRs: 1.86). Moreover, those who had abortions at home/other places were significantly more likely to use short-acting modern methods and traditional methods as compared to women undergoing abortions at private health facilities (RRR: 1.30 and RRR: 1.62, respectively).

Table 4. Cumulative rate of method discontinuation after abortion among currently married women aged 15–49 years who underwent abortions in the five years preceding the survey, by method type, India, NFHS-4, 2015–2016

Contraceptive method	Rate at month 1 (%)	Rate at month 3 (%)	Rate at month 6 (%)	Rate at month 12 (%)
Overall	6.0	12.7	20.9	31.2
IUCD	4.9	11.1	15.3	24.3
Short-acting modern methods	7.2	14.6	22.7	33.7
Traditional methods	4.1	9.7	19.2	28.8

Probability of discontinuing post-abortion method

Table 4 provides the post-abortion contraceptive discontinuation rate for spacing methods. As mentioned earlier, women who adopted reversible contraceptive methods were included in this analysis. Results suggested that 6% of those who used reversible methods discontinued at month 1 after use and increased to 12.7%, 20.9%, and 31.2% at months 3, 6 and 12, respectively. Further, those using short-acting modern methods had higher rates of contraceptive discontinuation in the initial months, while those using traditional methods had the lowest discontinuation rates for the same timeframe. In later months, rates were lowest among IUCD users. Around one-third (33.7%) of modern spacing users, 28.8% of traditional users and 24.3% of IUCD users discontinued use at month 12 of method adoption.

Table 5 presents hazard ratios (HRs) from the Cox proportional hazard model, evaluating the factors associated with discontinuation of spacing methods. Findings showed that religion, mass media exposure, place of residence, and timing of abortion were not significantly associated with the risk of method discontinuation. Younger women (HR: 0.96), women with fewer years of schooling (HR: 1.23), and those belonging to other castes (HR: 1.20) had a higher risk of method discontinuation compared to their respective counterparts. The hazard of method discontinuation was lower among higher parity women. It was least among women with two surviving sons at the time of abortion (HR: 0.55). Further, women from the highest wealth quintile were at lower risk of method discontinuation after an abortion (HR: 0.70) than their poorer

counterparts. The risk of method discontinuation was significantly lower among women living in the central (HR: 0.76), eastern (HR: 0.68), north-eastern (HR: 0.62), and western regions (HR: 0.75). This risk was higher among women belonging to southern regions of the country (HR: 1.68) as compared to those from northern regions. Remarkably, women using IUCD (HR: 0.63) or traditional methods (HR: 0.85) were at a lower risk of discontinuing a contraceptive method as compared to women using short-acting modern methods.

Discussion

This study examined the uptake of contraceptive methods and its discontinuation among women who had induced abortions. It has been emphasised that all women should be offered contraceptive counselling and services including emergency contraception before leaving the health facility following abortion.^{10,11} Despite this, only 20% of the study sample accepted any contraceptive method by the end of the first month after abortion. Those who adopted contraceptive methods preferred short-acting over long-acting methods. Historically, the uptake of IUCDs in India has been lower than other short-acting methods, as also found by Banerjee et al.²¹ A probable explanation could be that women can choose from a range of short-acting methods, whereas the only long-acting method available in India is the IUCD. Lack of awareness and myths related to IUCDs are additional barriers. Past studies have shown that women who adopted PPIUCD consisted of both women who wanted to space

Table 5. Hazard ratios of post-abortion temporary method discontinuation from the proportional hazard models, NFHS 4, 2015–2016

Background characteristics	N = 4091 Hazard ratio [Confidence Interval]
Age at abortion	0.96*** [0.95–0.97]
Education (No education [®])	
Primary	1.23** [1.00–1.51]
Secondary	1.08 [0.90–1.29]
Higher	1.08 [0.85–1.38]
Caste (Scheduled Caste [®])	
Scheduled Tribe	1.20 [0.96–1.50]
Other Backward Classes	1.14 [0.97–1.34]
Others	1.20** [1.01–1.42]
Religion (Muslim [®])	
Hindu	1.09 [0.93–1.28]
Others	1.09 [0.85–1.41]
Surviving children at the time of abortion (No child/single child [®])	
Two children – 1 son and 1 daughter	0.66*** [0.56–0.78]
Two children – both sons	0.55*** [0.43–0.69]
Two children – both daughters	0.71** [0.55–0.93]
Three or more children- any sex	0.73*** [0.61–0.88]
Mass media exposure (No [®])	
Yes	1.00 [0.84–1.21]
Wealth quintile (Poorest [®])	
Poorer	1.02 [0.83–1.25]
Middle	0.98 [0.79–1.22]
Richer	0.90 [0.71–1.13]
Richest	0.70** [0.54–0.91]
Place of residence (Rural [®])	
Urban	0.97 [0.86–1.11]
Region (North [®])	
Central	0.76*** [0.65–0.90]
East	0.68*** [0.57–0.83]
Northeast	0.62*** [0.52–0.74]
West	0.75** [0.58–0.98]
South	1.68*** [1.30–2.15]

(Continued)

Table 5. Continued	
Background characteristics	N = 4091 Hazard ratio [Confidence Interval]
Time of abortion (First trimester ^a)	
Second or third trimester	1.20 [0.95–1.52]
Post-abortion contraceptive use (Short-acting modern methods ^a)	
IUCD	0.63*** [0.51–0.78]
Traditional methods	0.85** [0.76–0.96]

Note: Significance level * $p < 0.1$. ** $p < 0.05$. *** $p < 0.01$.

children and those who wanted to limit childbearing.²⁸ Women's acceptance of PPIUCD as a method to limit future childbearing indicates its importance in the basket of available PAC methods.

The analysis indicated that the place of abortion plays an important role in the uptake of contraceptive methods post-abortion. It is apparent from the results that there was a higher uptake of sterilisation and IUCD among women who underwent abortions in public health facilities compared to those who accessed private health facilities. These results may be explained, first, by the dominance of sterilisation and rapid expansion and repositioning of PPIUCD as a result of the Government of India's efforts through the national family welfare programme.^{21,29} Second, private health facilities are often unaware of or not associated with the government's family planning schemes.³⁰ Third, studies suggest a lack of stocks and appropriate counselling at private health facilities compared to public health facilities.³¹ A study by Sahoo et al.³² suggested that the overall availability of at least five contraceptive method choices was very poor in selected states of India and private facilities performed worse than public facilities in this respect. Fourth, the difference in the cost of these services mattered as private facilities often made profits while public health facilities provided contraceptive services for free. Lastly, there is evidence of providers coercing women to adopt a specific contraceptive method, such as sterilisation or IUCDs as a pre-condition to abortion.^{33,34} Such requirements were observed more in public health facilities than in the private ones.³²

It was observed that compared to women who underwent abortions at private health facilities

those who had the abortion at home/other places were more likely to adopt modern spacing methods and traditional methods. The results of this study are in accordance with other studies that suggest more women opt for short-acting methods after a medical abortion at home/other places. This is seen to be lower in women undergoing abortions in facilities, where acceptance of long-acting methods like IUCDs and sterilisation was higher.²¹ It might be possible that the women who had abortions at home/other places did not want to disclose their abortion to other family members and were afraid of visiting a health facility. Therefore, they sourced medical abortions from local pharmacists. As well, they relied on short-acting modern and traditional methods for contraception rather than long-acting methods that needed visits to a health facility. However, these results should be interpreted with caution because of the possibility of reverse causation.

It is also apparent from the findings of this study that the use of methods, if any, prior to the abortion had significant bearing on the choice women made post-abortion. Those who were using any contraception prior to the abortion were more likely to opt for any contraception post-abortion. It is intriguing to note those who were using traditional methods before the abortion had higher chances of using traditional methods post-abortion. It has been established that reliance on traditional methods of contraception was associated with high failure rates which might result in subsequent unplanned pregnancies and abortions.³⁵ Using traditional methods put these women at risk of repeated abortions. Findings suggested a need for behavioural change among women towards adopting more effective

methods post-abortion. This study, similar to the study conducted by de Oliveira et al. (2014)³⁶ found a positive relationship between adoption of sterilisation post-abortion and number of living children, particularly number of living sons. Further, in cases where couples did not have sons, they were more likely to choose short-acting modern methods or traditional methods post-abortion.

Consistent with previous studies, education was found to have a positive relationship with the uptake of short-acting modern methods.^{19,37,38} It is believed that educated women have better knowledge and access to modern methods compared to their less educated counterparts. Although not included in the study due to limited information in the dataset, women's lack of autonomy on the decision to use contraception and partner's unsupportive attitudes towards its use might pose barriers in contraceptive uptake after an abortion.^{39,40} Through this study, it was found that the poorest and socially deprived ethnic groups (STs) were at a disadvantage in terms of using a temporary method of contraception, as also suggested by other studies.¹⁹

Results from this study also indicated that women opting for IUCDs were less likely to discontinue compared to those using short-acting modern methods. Other studies acknowledge that the discontinuation was lower in the case of IUCDs due to its greater effectiveness, the need for removal by a health care provider and the woman's desire for longer-term protection from unintended pregnancies.^{41,42}

This study is one of the first attempts to investigate post-abortion contraceptive acceptance in India using a largescale dataset. However, the findings of this study should be viewed within the context of some limitations. First, there may be chances of recall error in reporting contraceptive use following an abortion that occurred in the distant past, the analyses were based on the reproductive calendar that asked women for information during the five years preceding the survey. Second, since NFHS-4 only captured the place and not the method of abortion, it was difficult to explain why only about 24% of abortions were reported as being conducted at home/other places; whereas, Singh et al.⁴³ estimated that over 70% of abortions were conducted at home (self-users of medical abortions). Third, facility or provider related factors could not be assessed due to

the paucity of information. However, available evidence in the literature showed that provider's attitude, counselling, and quality of care were pertinent factors determining contraceptive uptake.^{1,44–46}

Conclusion

The present effort to understand the dynamics of contraceptive use after an abortion at public and private health facilities offers some useful insights. These insights are critical for addressing the cycle of unintended pregnancies and repeated abortions. The uptake of modern contraception among women who sought abortions at private health facilities or at home/other places was low. Instead, public health facilities mostly provided permanent and long-acting reversible contraceptives like IUCDs, thus implying the lack of a wide basket of post-abortion choices to women. The findings clearly demonstrate the lack of effective and comprehensive family planning policies for women seeking abortions in both public and private health facilities. Though there are various policies and programmes already in place, efforts are needed to effectively implement them.

A substantial percentage of women (around one-fourth) relied on self-administration of medical abortion and they are very likely not to have contacted the health care provider even once. Efforts are needed to reach these women in order to provide them with sufficient information on the process of medical abortion as well as post-abortion counselling and services when required. Tele-health services for abortion care may help these women to receive accurate information and support on abortion methods, processes, and subsequent need for contraception within the realm of their sexual and reproductive rights. Further, targeting women from the poorest and socially disadvantaged communities will help alleviate the burden of abortion. This study advocates for in-depth studies to examine the interrelationship between place of abortion, level of quality family planning services, and post-abortion contraceptive uptake in India.

Disclosure statement

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Data availability statement

The dataset used in this research paper is available on the Demographic and Health Surveys (DHS) repository. The data can be downloaded from www.DHSprogram.com.

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Résumé

Le besoin insatisfait de contraception est documenté comme déterminant important des grossesses non désirées et d'un nombre élevé d'interruptions de grossesse. La période suivant immédiatement un avortement est reconnue comme une occasion unique de proposer des services de contraception. Cet article se penche sur l'association entre le lieu de l'avortement et le comportement contraceptif des femmes après une interruption de grossesse. Les données reproductives du quatrième cycle de l'enquête nationale sur la santé familiale (NFHS-4) (2015-2016) ont été utilisées pour cette étude. Des modèles de régression logistique multinomiale ont permis de comprendre les facteurs associés au choix de méthodes post-avortement. Des tableaux démographiques à extinction simple ont été établis pour examiner les probabilités et les corrélats de l'abandon d'une méthode. Un mois après l'avortement, près de 20% des femmes ayant avorté avaient adopté une méthode contraceptive. La décision de choisir des méthodes telles que la stérilisation ou les dispositifs contraceptifs intra-utérins (DIU) était associée au lieu de l'avortement, au comportement contraceptif passé, au nombre et au sexe des enfants survivants au moment de l'avortement, à l'exposition aux médias et au moment de l'avortement. Comparées à celles qui avaient avorté dans des centres de santé privés, les femmes ayant avorté dans un établissement de santé public avaient plus de probabilités de choisir une méthode permanente ou un DIU. De plus, les femmes qui avaient opté pour un DIU avaient moins de risques d'abandonner la méthode par rapport à celles qui utilisaient des méthodes modernes de courte durée. Le manque de choix contraceptifs pour les femmes après un avortement est manifeste dans le faible recours aux contraceptifs post-avortement dans les centres privés et la promotion prédominante de méthodes permanentes et du DIU dans les centres de santé publics.

Resumen

La necesidad insatisfecha de anticoncepción ha sido documentada como determinante significativo de embarazos no intencionales y del alto índice de abortos inducidos. El período inmediatamente después de un aborto es reconocido como una oportunidad única para ofrecer servicios de anticoncepción. Este artículo explora la asociación entre el lugar donde se efectúa el aborto y el comportamiento anticonceptivo de las mujeres postaborto. Para este estudio se utilizaron los datos del calendario reproductivo de la Encuesta Nacional de Salud Familiar (NFHS-4) (2015-16). Se utilizaron modelos de regresión logística multinomial para entender los factores asociados con las elecciones de método postaborto. Se crearon tablas de vida de decrementos únicos para examinar las tasas de abandono del método anticonceptivo y se utilizaron modelos de riesgo proporcional para examinar la probabilidad y los correlatos del abandono del método. Aproximadamente el 20% de las mujeres que tuvieron un aborto adoptaron un método anticonceptivo al final de un mes posterior al aborto. La decisión de elegir métodos como esterilización o el dispositivo intrauterino (DIU) se asoció con el lugar donde se realizó el aborto, antecedentes de comportamientos anticonceptivos, número y sexo de los hijos vivos en el momento de realizar el aborto, exposición a los medios de comunicación masiva y el momento en que se realizó el aborto. En comparación con las mujeres que tuvieron un aborto en un establecimiento de salud privado, las mujeres que buscaron un aborto en establecimientos de salud públicos eran más propensas a elegir un método permanente o el DIU. Además, las mujeres que optaron por un DIU eran menos propensas a abandonar el método comparadas con aquellas que utilizaron un método moderno de corta duración. La falta de opciones anticonceptivas postaborto para las mujeres es evidente en el bajo índice de aceptación de anticonceptivos postaborto en establecimientos de salud privados y en la promoción predominante de métodos permanentes como el DIU en establecimientos de salud públicos.