RESEARCH ARTICLE

Factors associated with fertility limiting intention and contraceptive use among currently married men in India

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Abstract: Family planning methods are generally considered as women's responsibility in India. The volumes of research done so far in the family planning methods and reproductive behaviors have kept women at the center of the matter. Consequently, the research on the men's perspective on the same is generally being neglected. The present study intends to address intention of fertility stopping or fertility limiting and contraception behaviors and their associated factors among currently married men aged 20-49 years in India who had at least one living child. The fourth round of the National Family Health Survey in 2015-2016 was used to achieve the study objectives. Descriptive statistics and binary and multinomial logistic regression models were applied to more than 48,000 men who met the requirement. The findings of the analysis indicate that more than three-fourths currently married men did not want another child, and the fertility stopping intention significantly varies by demographics (i.e., men's age, number of children, and sex composition of children), socio-economic characteristics, residence, geographic region, and religion of the respondents together with type of caste and social media exposure. The men's fertility stopping intention was also linked with geographic region, types of religion and castes, and exposure of social media. Result further reveals that only <30% of men who did not want to have another child were using a contraceptive method at the time survey. Among users, female sterilization was the most popular method among married couples in India. Demographic factors, socio-economic characteristics, region and culture, and exposure of social media were all associated with use or not-using and use of a specific conceptive method. Overall, the findings suggest men's fertility stopping intention and their use of contraception are complicated, and it needs to consider men as a target group in fertility regulation interventions. The reproductive health programs aiming to increase uptake of modern contraceptives by sexually active men in India should consider the importance of sex education and ensure access to mass media.

Keywords: Fertility limitation intention; Contraceptive use; Male involvement; Reproductive health; Family planning; India

1. Introduction

The significance of the use of family planning methods is well documented, not only having improved women and child health but also having added to related issues such as gender equality, better child health, an improved response to HIV, greater education outcomes, and poverty reduction to development agenda (Loaiza, Luchsinger, and Liang, 2016). The higher utilization of contraception has been both an instrumental factor in the demographic transition and an indicator of changes in the attitudes and cultural patterns of society as a whole (Bongaarts, Mauldin, and Phillips, 1990; Van de Kaa, 2001).

Globally, about 48.5% of women in their reproductive ages were using some form of contraception in 2019. However, it was much lower in the least developed regions with only about 29% in Sub Saharan African countries followed by about 34% in Northern Africa and western Asian countries and highest (60%) in Eastern and Southeastern Asian region (United Nation, 2019). According to the United Nation (2019), female sterilization was the most common contraceptive method used worldwide in 2019, accounting for 23.7% among those women with any methods globally, followed by male condom (21.6%), IUDs (17.3%), and pill (16.5%). Male sterilization accounted for 1.8%, and withdrawal accounted for 5.2%. About 27.4% of couples using methods related to men (male sterilization, male condoms, and withdrawal). The highest prevalence of these methods was 36.5% in Europe and Northern America and the lowest share was around 20% in sub-Saharan Africa and Latin America and the Caribbean. Only 10.5% of women of reproductive ages in the Southern Asia countries (India, Nepal, Bangladesh, etc.) were relying on methods that required active male participation such as vasectomy, condoms, periodic abstinence, or withdrawal (United Nation, 2019).

The prevalence of unmet for family planning was 14.2% at the world level in 2019, and it was much higher in the less developed regions with 87 million of women in Southern Asia, 28 million women in Eastern Asia and 23 Million in South-Eastern Asia have unmet need of family planning in 2019 (Kantorová, Wheldon, Ueffing, *et al.*, 2020). Moreover, the global number of women in reproductive ages using contraception is projected to rise by 76 million, from 842 million in 2019 to 918 million in 2030 (Kantorová, Wheldon, Ueffing, *et al.*, 2020). Growth in the number of contraceptive users is projected to be high for all regions of Africa and in Southern Asia (United Nation, 2019). In line with this vision, India had committed to upsurge of the modern contraceptive usage from 53.1% to 54.3% and ensure that 74% of the demand for modern contraceptives are satisfied by 2020 (GOI, 2017).

However, family planning programs have conventionally focused mainly on women, with the aim to help reduce the burden of unintended pregnancies, overlooking the importance of male participation in family planning programs (Blossfeld and Kiernan, 1995); men have been long considered to be beyond the scope of family planning programs (Cleland, Bernstein, Ezeh, *et al.*, 2006). Despite women's increasing influence on household decision-making, their preferences of regarding contraceptive choices and family size may not be translated into practice unless they conform to their husband's wishes (Dahal, Padmadas, and Hinde, 2008). The reasons include that reproduction is primarily a women's issue and that men usually do not take responsibility for reproductive health and family planning (Cleland, Bernstein, Ezeh, *et al.*, 2006; Raju and Leonard, 2000; Ha, Jayasuriya, and Owen, 2003).

Fortunately, there is a growing body of research in both Africa and Asia that gender and social norms play a significant role in determining the use of contraceptive, with men playing a greater role in the decision-making (Mishra, Nanda, Speizer, *et al.*, 2014; Withers, Dworkin, Zakaras, *et al.*, 2015). Many studies further show that women's fertility preferences and contraceptive adoption are influenced by husband's influence on women's decision-making as well as their own attitudes (Beekle, 2006; Bogale, Wondafrash, Tilahun, *et al.*, 2011; Greene and Biddlecom, 2000; Niraula, 1998; Nte, Odu, and Enyindah, *et al.*, 2009; Tuloro, Deressa, Ali, *et al.*, 2006). Several studies have also found that men's attitudes toward gender equality are associated with condom use to prevent HIV/AIDS (Bruhin, 2003; Bogale, Wondafrash, Tilahun, *et al.*, 2011; Pulerwitz, Amaro, Jong, *et al.,* 2002).

Past studies further asserted that discussion of family planning with a health worker, region, education, wealth index, number of surviving children, exposure to media, men's working status, and fertility preference are the most important determining factors of the contraceptive use among men (Chauhan and Prasad, 2021; Kabagenyi, Ndugga, Wandera, *et al.,* 2014; Kogay and Itua, 2017; Ochako, Temmerman, Mbondo, *et al.,* 2017; Okigbo, Speizer, Corroon, *et al.*, 2015). Researches further suggested that contraceptive use is likely to be more operative for women when men are enthusiastically involved by the programs, through any means (Shattuck, Kerner, Gilles, *et al.,* 2011; Terefe and Larson, 1993). The perceptions of community norms and social network also influence the approval of family planning among men (Dynes, Stephenson, Rubardt, *et al.*, 2012). In addition, it is found that men with more gender equitable attitudes are more likely to use modern methods (Mishra, Nanda, Speizer, *et al.,* 2014; Chauhan and Prasad, 2021). Similarly, studies conducted in Nepal and Uganda show that fertility intension and fertility preference (>2 children) generally determines by the various demographic, socio-economic, and culture factors of the individuals and communities (Dahal, Padmadas, and Hinde, 2008; Matovu, Makumbi, and Wanyenze, *et al.,* 2017; Paudel and Acharya, 2018; Aung, Soe, and Moh, 2019). In sum, the men's view of their family size, gender preferences, timing of childbirth, length of birth intervals, the usage of contraceptives, and the social and cultural environment where they live affect their reproductive behavior were evidenced to be associated with the contraceptive use (Koffi, Weidert, Bitasse, *et al.*, 2018).

Since men are the heads of households, they make decisions around the well-being of their households including decisions on family planning (Adelekan, Omoregie, Edoni, *et al.,* 2014). Men should be deliberated not only as women's partners but also as individuals with diverse reproductive behavior and desires of their own (Greene, Mehta, Pulerwitz,

et al., 2006). It has been seen that husbands often play a critical role in decision-making regarding the timing and number of a couple's births (Kriel, Milford, Cordero, *et al.,* 2019; Link, 2011). Moreover, male involvement in family planning should be viewed in terms of not only the share of male method use but also men's attitudes regarding method choices and family size preferences. To understand the male involvement in the fertility or reproductive process requires a systematic analysis of men's attitudes toward spacing and limiting behavior.

In a developing country like India, most of the decisions regarding family formation are taken care of by men (Forste, 2002). Another reason may be due to India being a patriarchal society; women are subjugated to decide even for their own life, lowering female autonomy, and raising preference for male child. Patriarchy, which exists in both rural and urban parts of India, often ends with husbands dominating the power in determining the use of contraception. Nevertheless, in India, the contraceptive method most often used by women who want to limit their family size is female sterilization (IIPS and ICF, 2017). Although both men and women can have permanent sterilization, vasectomy is a technically easier, safer, and more effective procedure than female sterilization. Furthermore, in India, research on men fertility stopping intention (do not want another child) using the national representative dataset is almost unavailable.

Hence, the present study is an attempted to bridge this gap using nationally representative data set; and further to understand the determinants of fertility stopping intention (do not want another child) among currently married men of India. For that, the focus of this paper is twofold. First, the paper investigates the factors associated with fertility stopping intention among currently married men who had already at least one child. Second, the paper examines factors associated with use of family planning methods among sexually active men in India who have already at least one child and do not want another child (Mason and Smith, 2000). Below we describe the data and methods used for the present research, followed by the results, interpretations of major findings and their implications.

2. Data and Methods

2.1. Data sources

The current study used data from the fourth round of the National Family Health Survey (NFHS-4) conducted during 2015-2016 by the International Institute for Population Sciences (IIPS) Mumbai under the stewardship of the Ministry of Health and Family Welfare (MoHFW), Government of India, covering the 29 states and seven union territories. NFHS is a nationally representative population based survey which collects information on various issues, including but not limited to male and female fertility behavior, family planning use behavior, nutritional status of male, female and children, domestic violence, reproductive health services utilization, and information on communicable and non-communicable diseases. The survey followed a stratified two-stage random sample design using the sampling frame of the 2011 Population Census. The census enumeration block in urban areas and villages in rural areas served as primary sampling unit for this. The response rate of the Survey was 98%, 97%, and 92% for household, ever married women, and ever married men, respectively. Overall, there were 122,051 eligible men aged 15-54 years in households selected. The interviews were completed with 112,122 men, for a response rate of 92%. The detailed methodology of the survey is given elsewhere (IIPS and ICF, 2017).

The study is based on currently married men to investigate their intention for true fertility limit and contraceptive use behaviors. To align with the study aims, out of total married men (70,215 cases), we excluded those men who did not have any living child (8799 cases) at the time of survey. Furthermore, we excluded those cases which replied as "undecided," "he or his partner were sterilized," and "he or his partner declared infecund" (6,556 cases) for fertility preference. In addition, men below the age of 20 years and above 49 years (6706 cases) were also excluded from the study. Thus, our sample for fertility limiting intention analysis comprised 48,166. In analyzing the use of contraceptive methods, we further excluded those men who had intention to have an extra child (11,248 cases), which came up with 36,918 men aged 20-49 years who had at least one living child at the time of survey. It is worth mentioning that the study has not found any case of male sterilization after applying all the exclusion criteria. Therefore, the male sterilization category is not available in our main outcome variables.

2.2. Dependent Variables

Fertility intention and contraception were the outcome variables of the study. Fertility intention was defined whether married man wished to have one child or more regardless of timing. We classified it as dichotomous variable (want to one or more vs. do not want). We focus on the category of not wanting any more child (or wishes to stop having any more child), termed as fertility stopping or limiting intention.

Contraceptive use was defined as current use of any method among all sexually active men (20-49 years) who ever had sex involving not only men's methods but also other types related to women's contraception. Female sterilization is a modern method; however, due to its relatively large proportion, this study classified it as a single category. In other words, the contraceptive methods were categorized into three categories: Modern methods (condoms, pills, injections, implants, and IUDs), female sterilization, and traditional methods. The study used responses from men because men influence the choice of contraceptive methods within their families, which is also consistent with the objectives of this study.

2.3. Factors Associated with Fertility Intention

The study included all major possible demographic and socio-economic variables as independent variables that associated with fertility intention and the contraceptive use based on the existing literature (Cohen, 2000; Haq, Sakib and Talukder, 2017; Banerjee and Trigun, 2020). The demographic variables included respondent's age (20-29 years, 30-39 years, and 40-49 years) and sex composition of living children (all daughters, all sons, equal number of sons and daughters, more daughters than sons, and more sons than daughters). Socio-economic factors included educational attainment (no education, primary school, secondary school, and high school or above), wealth quintile (poorest, poor, middle, rich, and richest), current occupation (not working, professional, clerical/sales/service, agriculture, and manual workers), place of residence (urban vs. rural), and regions (North, Central, East, Northeast, West, and South). A man's education, wealth, and occupation mainly reflect his individual socioeconomic status (SES), whereas current place of residence or region mainly reflect of macro-level of socioeconomic development for a place/community where he was living at the time of survey. To account for the possible religious and cultural influence on fertility intention and contraceptive use, we included types of religions (Hindu, Muslim and others) and Caste (Scheduled Castes, Scheduled Tribes, Other Backward Class, and Others), terms as region, and cultural factors. Finally, we included a variable of social media exposure (no exposure vs. any exposure) to take into account of the possible influence of governmental intervention programs on family planning and modern values.

2.4. Statistical Diagnostic of Data

Descriptive statistics were used for demographic and socioeconomic characteristics on contraception use and fertility intention. In descriptive statistics, the Chi-square test was used to see if there were any differences in family planning method used by selected covariates. For analyzing factors associated with fertility stopping intention, in addition to base regression that included only each of all factors as a predictor, four nested binary logistic regression models were employed among 48,166 married men with at least one child. Model I included demographic variables only. Model II added socio-economic factors into Model I. Model III further included cultural and religious variables. Model IV additionally add exposure to social media. For the contraceptive use, two sets of regression models were employed. The first set examined what factors were associated with use of any contraceptive method among 36,918 men who do not wish to have additional child using binary logistic regression. The second set used multinomial logit regression models to examine associates of use of modern contraceptive method or female sterilization relative to tradition method among 10,562 men who wish to stop having any more children. Similar modeling strategy as for fertility stop intention was used for the contraceptive use. Multicollinearity was not found among independent variables. STATA version 14.1 was used for analysis of this study.

3. Results

3.1. Results for Analyses of Fertility Stopping Intention

The sample distribution of men with at least one living child and their choices on further children is presented in Table 1. Overall, about 78.4% of the married men with least one child at the time of survey did not wish to have one more child regardless of timing. However, the wish for additional child varies by selected covariates among the sample. For example, more than half (54%) married young men (age 20-29 years) wanted to have at least one more children in comparison with only 22% and 5% in ages 30-39 and 40-49 years, respectively. In terms of sex composition of children, more than 90% of married men who had both boys and girls wished to stop to have additional child in comparison with about 68.8% among men with all sons and 46.5% among men with no sons. From the perspective of socio-economic characteristics, except small difference found in urban and rural areas, noticeable differences were found for other characteristics. Differences for cultural and religious characteristics are mild or moderate. The proportion of wishing not to have any more children is similar between men with any social media exposure and those without.

Table 1. Percentage distribution of currently married men aged 20-49 years who had at least one living child, by selected characteristics according to fertility intention, India, 2015-2016.

Background characteristics	N	Wanting more children (N=11,248)	Not wanting more Child (N=36,918)	*P*-value
Total	48,166	21.6	78.4	
Demographic characteristics				
Age (years)				
20-29	9,160	54.0	46.0	
30-39	20,632	22.3	77.7	0.000
40-49	18,374	5.0	95.0	
Number of living children				
1	10,795	63.9	36.1	
2	17,753	11.2	88.8	0.000
3	10,555	6.3	93.7	
4+	9,063	4.9	95.1	
Sex composition of living children				
All daughters	8,384	53.5	46.5	
All sons	13,018	31.2	68.8	
# of sons = # of daughters	12,286	7.0	93.0	0.000
# of daughters > # of sons	7,529	5.2	94.8	
# of sons > # of daughters	6,949	2.8	97.2	
Socioeconomic characteristics				
Educational attainment				
No Education	8,205	16.3	83.7	
Primary school	7,688	18.3	81.7	
Secondary school	26,022	22.3	77.7	0.000
High school or above	6,251	28.7	71.3	
Current occupation				
Not working	2,779	23.3	76.8	
Professional	3,208	26.9	73.1	
Clerical/sales/service	9,852	22.7	77.3	0.000
Agriculture	17,733	18.3	81.7	
Manual workers	14,520	23.0	77.0	
Wealth quintile				
Poorest	8,858	22.6	77.4	
Poorer	10,193	21.1	78.9	
Middle	10,162	20.8	79.2	0.032
Richer	9,520	20.8	79.2	
Richest	9,433	22.8	77.2	
Current residence				
Urban	14,335	22.3	77.7	
Rural	33,831	21.2	78.8	0.073
Regions				
North	10,662	20.4	79.6	
Central	12,426	22.2	77.8	
East	7,978	22.7	77.3	0.000

(Contd...)

Table 1. *(Continued).*

Background characteristics	N	Wanting more children (N=11,248)	Not wanting more Child (N=36,918)	*P*-value
Northeast	5,573	30.4	69.6	
West	5,522	18.4	81.6	
South	6,005	22.1	77.9	
Religious and cultural factors				
Religion				
Hindu	36,803	20.7	79.3	
Muslim	6,430	27.5	72.5	0.000
Others or no religion	4,933	21.3	78.7	
Caste				
SCs/STs	16,849	22.0	78.0	
OBCs	19,145	21.5	78.5	0.331
Others	9,668	20.8	79.2	
Media exposure				
No exposure	9,744	20.7	79.3	
Any exposure	38,422	21.8	78.2	0.094

(1) *P* values are based on the Wald-Chi-square test from weighted bivariate logistic regression between each single factor and the outcome variable of fertility intention. (2) SCs: Scheduled Castes; STs: Scheduled Tribes; OBCs: Other backward castes. (3) Percentage are weighted and numbers are unweighted. Cases may not be equal due to missing values.

The results of multiple nested logistic regression analyses are presented in Table 2. In this table, four separate models were applied. The results in Model I show that men in ages 30 s and 40 s were 1.55 times (=2.55-1) and 10.04 times more associated with not wishing to have more children as compared to men in 20 s, respectively, which is expected as young men have not had their expected numbers or sexes of children they wishes, while older men who likely have already had desired numbers or sexes of children. These odds ratios were not altered when different other covariates were controlled for. Compared to men with only on child, men with 2, 3, or 4+ children were associated with as much as 8.06, 9.05, and 9.19 times odds of not wishing to have an additional child. These odds ratios were mildly enhanced when other covariates were controlled for. Model I further reveals that men having no son were associated with 71% (=1-0.29) lower odds of not wishing to have more children as compared men whose children were all sons, and the odds ratio was robust across all models regardless of presence of other covariates. This may imply that there is son preference or preference for having both sons and daughters among married men in contemporary India. Interestingly, compared to men with children of all sons, men with children of equal sons and daughters and men with children of more daughters than sons were associated with 40% (=1.40-1) and 34% higher odds of not wishing to have an additional child in Model I. The odds ratio of wishing to stop having more children for men who had more sons than daughter could reach 2.06. The odds ratios for sex composition of children were slightly strengthened when other covariates were adjusted for. These results indicate that compared to men who have both boys and girls, men with children of either all girls or all boys are more likely to wish to have more children, implying that Indian men have strong preference for having both sons and daughters.

The associations between intention of fertility stopping and other covariates are also noteworthy mentioning. For individual SES factors, with an exception for the wealth quintile, the associations between fertility stopping intention and education and occupation were relatively weak or not significant, especially when other sets of covariates were further controlled for. For example, compared to men with no schooling, men with a primary and secondary educational attainment were associated with 13-14% higher odds of not wishing to have one more children when demographic and socio-economic factors were controlled for (Model II); however, when religious and caste factors were further adjusted for, the odd ratios were reduced to non-significance (Models III and IV). One unexpected finding was that there was no difference in fertility intention between men with no schooling and men with high school or above, even when no religious and caste types and social media exposure were adjusted for. Except for the professional category of occupation, no difference was found for other occupational categories in comparison with jobless men. Men in agriculture were associated with 14% higher odds of not wishing to have more children as

Table 2. Odds ratios of wishing to stop wanting more children among currently married men aged 20-49 years who had already at least one living child, India, 2015-2016.

Background characteristics	Model 1	Model 2	Model 3	Model 4
Demographic characteristics				
Age (in years)				
30-39 (20-29)	2.55***	2.47***	2.46***	2.46***
40-49 (20-29)	11.04***	10.94***	10.88***	10.90***
Number of living children				
2 (1)	8.06***	8.51***	9.04***	9.04***
3 (1)	9.05***	10.61***	10.95***	10.94***
4+ (1)	9.19***	11.76***	13.24***	13.27***
Sex composition of living children				
All daughters (all sons)	0.29***	0.29***	0.28***	0.28***
# of sons = # of daughters (all sons)	1.40***	1.40***	1.46***	1.46***
# of daughters > # of sons (all sons)	1.34***	1.33***	1.39***	1.40***
# of sons > # of daughters (all sons)	2.06***	2.13***	2.39***	2.40***
Socioeconomic characteristics				
Educational attainment				
Primary school (no education)		1.13*	1.06	1.05
Secondary school (no education)		1.15**	1.02	0.99
High school or above (no education)		1.10	0.91	0.89
Current occupation				
Not working (manual worker)		1.08	1.09	1.09
Professional (manual worker)		0.88*	0.90	0.90
Clerical/sales/service (manual worker)		0.99	0.96	0.95
Agriculture (manual worker)		1.14***	1.09*	1.09*
Wealth quintile				
Poorer (poorest)		1.33***	1.38***	1.35***
Middle (poorest)		1.59***	1.67***	1.60***
Richer (poorest)		1.79***	1.89***	1.80***
Richest (poorest)		1.91***	1.90***	1.82***
Current residence				
Rural (urban)		1.11**	1.07	1.07
Regions				
Central (North)		1.04	0.83***	0.83***
East (North)		1.11*	0.88*	0.88*
Northeast (North)		0.44***	0.40***	0.40***
West (North)		1.43***	1.10	1.10
South (North)		1.15*	0.93	0.92

(Contd...)

Table 2. *(Continued).*

Background characteristics	Model 1	Model 2	Model 3	Model 4
Religious and cultural factors				
Religion				
Muslim (Hindu)			0.32***	0.32***
Others or no religion (Hindu)			0.62***	0.62***
Caste				
SCs/STs (others)			0.71***	0.71***
OBCs (others)			0.87**	0.87**
Social media exposure				
Any social media exposure (no)				1.13**
N	48,166	48,092	45,591	45,591
-log likelihood	16,138.2	15,729.9	14,420.6	14,417.0

(1) Category is the parentheses is the reference group. (2) SCs/STs: Scheduled Castes/Scheduled Tribes; OBCs: Other backward castes. (3) "N" is different due to missing values in the predictors (caste and occupation). NA, not applicable. (4) Model 0 refers to models without controlling for any other variable. (5) *$P < 0.05$, **$P < 0.01$, ***$P < 0.001$

compared to manual workers. In terms of wealth quintile, as expected, richer men were associated with higher odds of not wishing to have an additional child regardless of influences of different covariates. Compared to men with the lowest quintile of wealth (the poorest), men in the remaining four quintiles of wealth were associated with 33-91% higher odds of not wishing to have an additional child (Model II). There is gradient effect by wealth quintile. These odds ratios were only slightly not altered when religious and caste factors and social media coverage were further adjusted for (Models III and IV).

For the perspective of macro-level socio-economic development, men from rural areas were associated with 10% higher odds of not wishing to have more children compared to their urban counterparts when demographic and socio-economic factors were controlled (Model II). However, this rural-urban difference was not significant when types of religion and caste were present (Models III and IV). In terms of the subnational variation, when demographic factors and other socioeconomic factors were present, compared to men in Northern India, men in Northeastern India were associated with 56% lower odds of not wishing to have more children, whereas men in Eastern, Western, and Southern India were associated with 11%, 43%, and 14% higher odds of not to wish to have any additional child, respectively. No differences were found between Central India as compared to Northern India (Model II). However, when religious and caste types were controlled for, men in Central, Eastern, and Northeastern India were associated with 17%, 12%, and 40% lower odds of not wishing to have more children, respectively (Models III and IV). The higher odds ratio of not wishing to have more children in men in Western and Southern India as compared to men in Northern India were not significant anymore. Overall, the results of socio-economic factors in different models clearly indicate that religion and caste culture played an important role in regulating men's fertility intention in contemporary India.

In terms of types of religion, compared to men of Hindu, men of Muslim were associated with 68% lower odds of not wishing to have more children when demographic and socio-economic factors were adjusted for. Men of other religions or no religion had 38% lower odds of not wishing to have more children. Furthermore, men in SCs/STs or OBCs were associated with 29% and 14% lower odds of not wishing to have another child compared to men in other categories, respectively. The odds ratios for religion and caste types were not changed when the media exposure was considered. Table 2 further shows that men who had any social media exposure were associated with 13% higher odds of wishing to stop having an additional one child compared to men without of social media exposure when demographic, socioeconomic, and cultural factors were present.

3.2. Results for Analyses of use of Contraceptive Methods

Table 3 presents the distribution of contraceptive use by selected covariates among currently married men who did not want more children. Overall, there were 73% of Indian men who had 1+ child and wished not to have any more child were not using any contraceptive method, with 9.2% using modern methods, 13.4% using female sterilization, and 4.4% using traditional methods. Differences in using contraceptive methods varied for all study variables due to large sample size. For instance, compared to men in 30 s and 40 s, men in 20 s tended to have a greater proportion of not using any

Table 3. Distribution of currently married men who did not want more children and had already at least one living child by current contraceptive choices according to selected background characteristics, India, 2015-2016.

Background characteristics	N	Not using	Modern methods	Female sterilization	Traditional methods	*P*-value
Total	36,918	73.0	9.2	13.4	4.4	
Demographic characteristics						
Age (years)						
20-29	3,980	79.4	9.3	7.1	4.1	
30-39	15,647	72.1	10.8	12.8	4.3	0.000
40-49	17,291	72.2	7.6	15.6	4.5	
Number of living children						
1	3,424	76.7	13.2	4.4	5.7	
2	15,254	69.0	10.5	16.1	4.5	0.000
3	9,706	72.0	7.9	15.9	4.2	
4+	8,534	77.5	6.3	11.7	4.5	
Sex composition of the living children						
All daughters	3,435	74.6	11.5	9.0	4.9	
All sons	8,596	71.4	10.3	13.7	4.5	
# of sons = # of daughters	11,199	70.0	9.8	15.4	4.8	0.000
# of daughters > # of sons	7,035	73.8	8.0	13.8	4.3	
# of sons > # of daughters	6,653	74.4	6.8	14.6	4.1	
Socio-economic characteristics						
Educational attainment						
No Education	6,731	74.8	5.9	14.7	4.7	
Primary school	6,154	73.0	7.7	15.8	3.4	0.000
Secondary school	19,647	72.9	9.5	13.1	4.5	
High school or above	4,386	71.0	14.3	9.8	5.0	
Current occupation						
Not working	2,078	78.6	9.6	8.6	3.2	
Professional	2,326	70.1	15.6	9.6	4.8	
Clerical/sales/service	7,438	71.0	10.8	12.8	5.4	0.000
Agriculture	14,085	73.9	6.8	15.7	3.7	
Manual workers	10,936	70.3	9.9	14.6	5.2	
Wealth quintile						
Poorest	6,728	77.9	5.9	11.8	4.4	
Poorer	7,794	71.9	8.6	14.3	5.2	0.000
Middle	7,881	71.8	8.3	16.1	3.8	
Richer	7,363	72.3	9.6	14.1	4.0	
Richest	7,152	68.7	13.2	12.7	5.4	
Current residence						
Urban	10,865	73.1	11.2	11.2	4.5	0.000
Rural	26,053	73.0	8.1	14.6	4.3	
Region						
North	8,341	63.5	13.4	17.1	6.0	
Central	9,706	75.2	8.0	10.8	6.0	

(Contd..)

Table 3. *(Continued)*

Background characteristics	N	Not using	Modern methods	Female sterilization	Traditional methods	*P*-value
East	6,078	65.8	13.3	13.5	7.4	
Northeast	3,677	53.5	26.3	7.7	12.5	0.000
West	4,448	76.8	8.1	13.7	1.4	
South	4,668	79.3	3.2	16.3	1.2	
Religious and cultural factors						
Religion						
Hindu	28,944	73.2	8.2	14.3	4.3	
Muslim	4,512	70.0	15.2	9.2	5.6	0.000
Others or no religion	3,462	61.4	14.2	17.7	6.7	
Caste						
SCs/STs	12,513	71.7	8.0	15.5	4.8	
OBCs	15,023	75.4	7.8	13.1	3.6	0.000
Others	7,603	68.1	12.6	13.7	5.6	
Media exposure						
No exposure	7,571	78.6	5.8	10.8	4.9	
Any exposure	29,347	70.9	10.1	14.6	4.5	0.000

(1) *P* values are based on the Wald-Chi-square test from weighted multinomial logistic regression between each single factor and the outcome variable of fertility intention. (2) SCs: Scheduled Caste; STs: Scheduled Tribes; OBCs: Other backward castes. (3) Percentage are weighted and number are unweighted. Cases may not be equal due to missing values

contraceptive methods (79% vs. 72%); older men also had a mildly higher proportion of using female sterilization than young men (15.6% for ages 40s, 12.8% for ages 30s vs. 7.1% for ages 20s).

The results for factors associated with using contraceptive methods used versus not-using among married men with 1+ child and not wishing to have more children are presented in Panel A of Table 4, and the results for factors associated with using modern or female sterilization methods relative to the traditional method were presented in Panels B and C. The results in Panels B and C were derived from multinomial logit analyses in terms of relative risk ratios (RRRs) among men married men with 1+ child and not wishing to have more children. For the sake of simplicity and easiness of presentation and the similarity between Models II to IV, only the results from Model I and Model IV are presented here. The results of Models 0, II and III are presented in Appendix Table A1-A3.

For demographic factors, generally speaking, compared to their counterparts in ages 20s with 1+ child and wishing to stop having any more child, men in ages 30s or 40s were associated with 50-54% higher odds of using contraceptive methods (Model I in Panel A); and among those using contraception, men in ages 30s or 40s were associated with 47-79% higher likelihood of using female sterilization relative to a traditional method compared to men in ages 20s (Model I in Panel C). Such results were only slightly altered yet still significant even when adjusting for a wide array of covariates. There was no difference in use of a modern method relative to a traditional method when all covariates were adjusted for, although men in ages 30s were associated with higher likelihood of using a modern method. In comparison with men with 1 child, men with 2 or 3 children were associated 31% and 17% higher odds of using a contraceptive method and these odds were enhanced when other factors were present, whereas men with 4+ children were associated with 18% lower odds of using a method yet not significant when other factors were adjusted for. Among men using a contraceptive method, men with more children were associated with higher likelihood of using female sterilization instead of a traditional method. There was no difference in relative risk between using a modern method and using a traditional method for men of different children, especially when other covariates were adjusted for. Men with all daughters were associated with 17% lower odds of using a contraceptive method and such lower odds ratio was mildly reduced to 11% yet still significant when all study variables were controlled for. In comparison with men with all sons, men with other compositions of children's sex were associated with lower likelihood of using female sterilization instead of a tradition method and such patterns were robust when other factors were present.

In terms of socio-economic characteristics, although men with more education were associated with higher odds of using a contraception without controlling for any other factor (see Model 0 in Appendix Table A1), these associations

Table 4. Odds ratios (ORs) and relative risk ratios (RRRs) of use of specific contraceptive methods by major study variables in men aged 20-49 who did not have fertility intention for additional child and had at least one living child, India, 2015-2016.

Background characteristics	Panel A		Panel B		Panel C	
	Any method versus not using (ORs)		Modern versus traditional (RRRs)		Female sterilization versus traditional (RRRs)	
	Model I	Model IV	Model I	Model IV	Model I	Model IV
Demographic characteristics						
Age (in years)						
30-39 (20-29)	1.50***	1.45***	1.23*	1.19	1.47***	1.64***
40-49 (20-29)	1.54***	1.49***	0.88	0.82	1.79***	2.12***
Number of living children						
2 (1)	1.31***	1.38***	1.00	1.04	3.96***	3.85***
3 (1)	1.17**	1.24***	0.78	0.88	4.65***	5.32***
4+ (1)	0.82***	0.92	0.64***	0.77	3.43***	4.46***
Sex composition of living children						
All daughters (all sons)	0.83***	0.89*	1.10	1.04	0.52***	0.42***
# of sons = # of daughters (all sons)	1.02	0.99	0.98	0.94	0.78**	0.72***
# of daughters > # of sons (all sons)	1.02	1.00	1.10	1.00	0.71**	0.56***
# of sons > # of daughters (all sons)	0.96	0.97	1.03	1.04	0.85	0.81
Socio-economic characteristics						
Educational attainment						
Primary school (no education)		1.01		1.29*		1.21
Secondary school (no education)		0.94		1.20		0.74***
High school or above (no education)		0.95		1.41*		0.54***
Current occupation						
Not working (manual worker)		0.69***		1.49**		1.19
Professional (manual worker)		0.83**		1.42**		1.03
Clerical/sales/service (manual worker)		0.79***		1.14		0.97
Agriculture (manual worker)		0.78***		1.23**		1.37***
Wealth quintile						
Poorer (poorest)		1.29***		0.96		0.91
Middle (poorest)		1.30***		1.16		0.99
Richer (poorest)		1.36***		1.08		0.83
Richest (poorest)		1.66***		1.06		0.70*
Current residence						
Rural (urban)		1.14***		0.79**		1.02
Regions						
Central (North)		0.72***		0.61***		0.59***
East (North)		0.68***		0.77**		0.43***
Northeast (North)		1.01		0.77**		0.15***
West (North)		0.57***		1.82***		2.79***
South (North)		0.42***		0.83		4.32***
Religious and cultural factors						
Religion						
Muslim (Hindu)		0.91*		1.44***		0.35***
Others or no religion (Hindu)		1.10*		0.87		0.86

(Contd..)

Table 4. *(Continued)*

Background characteristics	Panel A		Panel B		Panel C	
	Any method versus not using (ORs)		Modern versus traditional (RRRs)		Female sterilization versus traditional (RRRs)	
	Model I	Model IV	Model I	Model IV	Model I	Model IV
Caste						
SCs/STs (others)		0.89**		1.06		1.35***
OBCs (others)		0.83***		1.09		1.21**
Social media exposure						
Any media exposure (no)		1.33***		1.42***		1.45***
N	36,918	35,086	10,562	9,900	10,562	9,900
-log likelihood	21,922.47	20,176.52	10,563.26	8,889.04	10,563.26	8,889.03

(1) The relative risk ratios based on multinomial logit models after taking traditional method as the base group. (2) Category is the parentheses reference group. SCs/STs: Scheduled Caste/Scheduled Tribes; OBCs: Other backward castes. (3) "N" is different due to missing values in the predictors (caste and occupation). (4) *$P < 0.05$, **$P < 0.01$, ***$P < 0.001$.

were not significant when demographic and other socio-economic factors or other factors were controlled for (see Model II in Appendix Table A1 and Model IV in Panel A in Table 4). Nevertheless, men with higher education were associated with lower likelihood of using female sterilization and higher likelihood of using a modern method instead of a traditional method. Compared to manual workers, men in other occupational categories were associated lower 17-31% odds of using a contraception in Model IV (Panel A), but they were associated with higher likelihood of using a modern method instead of a traditional method (except for men in the services sector) (Panel B), and men in agricultural sector were associated with higher likelihood of using female sterilization (Panel C). The higher income the higher the odds of using a contraception; however, there was no difference in using a specific method: Modern, traditional, or female sterilization. When no other factor was present, men in rural areas were associated with 7% lower odds of using a contraception (Model 0 in Appendix Table A1). However, when demographic and socioeconomic factors were present, men in rural areas were associated with 14% higher odds of using a contraception (Panel A), but they were associated with 21% lower likelihood of using a modern method instead of traditional method (Panel B). Compared to men in Northern India, men in other parts were associated with lower odds of using a contraception when no other factor was adjusted for (Model 0 in Appendix Table A1). Such patterns did not change with one exception for Northeastern India when all study variables were controlled for (Panel A in Table 4). Among men using a method, compared to men in Northern India, men in Central, Eastern, and Northeastern India were 23-39% lower likely to use a modern method and 41-85% lower likely to use female sterilization relative to using a traditional method, whereas men in Western India were 82% and 179% more likely to use a modern method or female sterilization relative to using a traditional method. For men in Southern India, they were 3.32 times more likely to use female sterilization relative to using a traditional method than men in Northern India, although men in these two regions had no difference in using a modern method relative to using a traditional method.

From the perspective religion and caste types, compared to men of Hindu, men of Muslim, and other religions were associated with 9% and 41% higher odds of using a method when no other factor was present (Model 0 in Appendix Table A1). However, when demographic and socio-economic factors and caste type were controlled for, men of Muslim were associated with 9% lower odds of using a contraception. The higher odds associated with men of other religions or no religion was also reduced to 10%. Overall, these findings suggest men of other religions or no religion was more likely to use a contraceptive method. When men choosing to use a contraceptive method, men of Muslim in comparison with men of Hindu were 44% more likely to use female sterilization yet 65% less likely to use a modern method instead of using a traditional method. Although men of other religions or no religion were 31% less likely to use female sterilization compared to men of Hindu (Model 0 in Appendix Table A3), such difference was not significant when demographic and socio-economic factors were controlled for (Panel C in Table 4). Compared to men in other categories, men in SCs/STs and OBCs were associated with 11% and 17% lower odds of using a method. There is no difference between these three groups of the sample in using a modern method relative to using a traditional method when demographic and socio-economic factors were adjusted for, but men in SCs/STs and OBCs were 35% and 20% likely to use female sterilization relative to a traditional method compared to me in others.

Finally, compared with men without social media exposure, men with social media exposure were associated with 33% higher odds of using a contraceptive method when all other variables were controlled for. The former was also 42%

more likely to use a modern method and 45% more likely to use female sterilization relative to using a traditional method than the latter.

4. Discussion

Population scientists have focused their study on fertility mainly on the fertility behavior of women while paying little attention to the role of men and the implication of their participation on fertility and population growth. However, there is evidence to show that men's participation in women's sexual and reproductive health is an important determinant of a positive reproductive health outcome for their partners and children (Assaf and Deavis, 2018) that men's influence on the desired number of children within the household is also vital for family planning, and that couples together can protect reproductive health by confirming the effective family planning method use, avoiding sexually transmitted diseases, and stabilizing fertility behavior (Koffi, Weidert, Bitasse, *et al*., 2018).

Using the fourth round of the National Family Health Survey (NFHS-4) data, the primary purposes of the present study are to investigate factors associated with the fertility stopping intention among currently married men of India who had at least one living child and factors associated with family planning method uses among currently married men of India who had at least one living child and had no intention to have another child. In our knowledge, this research is among the first that has systematically examined both men's fertility intention and contraceptive uses and their associated factors in a single research.

The findings of this study show that about 78% of the currently married men aged 20-49 with 1+ child in contemporary India did not wish to have any more child, yet more than 70% of these men did not use any contraceptive method. This is a clear indication of the higher unmet need of the family planning among reproductive couples (Dahal, Padmadas and Hinde, 2008) of India that need to be address through providing the basket of choices of contraceptive methods.

Regarding the factors associated with fertility intention and contraceptive use, we found that demographic, socioeconomic, religious and cultural, and social media exposure factors played a significant role in determining men's fertility intention as well as contraceptive use. Specifically, the odds ratios of not wishing to having any more child increased with age and the likelihood of using contraceptive method also increases with age, which is likely because older men had already had desired numbers and/or sex composition of children than younger men who have not had time to have their expected numbers and/or sex composition of children. This is also the case for the factor of the number of children.

The results further show that men having both girls and boys were associated with higher odds of not wishing to have another child compared to men either having all sons or having all daughters and that men having no sons were less like to stop having another child compared to men having all sons. This suggests that the sex composition of children plays a significant role in determining the men's fertility intention in contemporary India. In terms of contraceptive use, men with all daughters were less likely to use modern methods and less likely to use female sterilization, which is justifiable since they still wish to have more children. Nevertheless, men who intended to not have children were more likely to use contraception compared to those who intended to have more children (Roy, Ram, Nangia, *et al*., 2003), which is also consistent to our supplementary analysis using the NFHS-4 (not shown). Thus, understanding fertility intention and family planning use behavior of population can be another way to identify populations with higher need and less use of family planning than general population.

The finding that more educational attainment of men was associated with lower odds of not wishing to have one additional child is unexpected. This might be because illiterate men have already achieved the desired level of family size they desired as the age at marriage and the age at childbearing are lower among illiterates than among their counterparts more years of schooling (Chauhan, Sekher, Kumar, *et al*., 2020; Ní Bhrolcháin and Beaujouan, 2012). A closer examination the causes including whether there is a bias in sampling is clearly needed to further shed light on this. Men with more education tend to use modern spacing method instead of female sterilization and traditional methods. One reason is possibly that they have more access to modern methods. This finding is in line with previous findings (Dwivedi, Ram and Reshmi, 2007; Paudel and Acharya, 2018).

The occupation of the men influences the use of contraception (Kamal, 2000). Previous studies demonstrated that men in agrarian subsistence economies prefer large numbers of children both as a source of labor and economic gain, and as a source of prestige (Bankole and Singh, 1998; Blacker, Opiyo, Jasseh, *et al*., 2005; Ayhan, Gözükara, and Koruk, 2017; Hardee, Croce-Galis, and Gay, 2017). It is thus possible that men in the agricultural sector were more likely to wish to stop having one additional child, which is reflected in our findings (Kock and Prost, 2017). Our findings also show that men in the agricultural sector were associated with lower odds of using contraception (Adanikin, McGrath and Padmadas, 2017; Dral, Tolani, Smet, *et al*., 2018).). This implies a large unmet need among this group of population.

By contrast, we found that jobless men were less like to wish to stop having more children and were less likely to use a contraceptive method. This finding is similar to the one for men of the poorest, which is also consistent with previous studies (Ochako, Temmerman, Mbondo, *et al.,* 2017; Chauhan and Nagarajan, 2019). Jobless men and the poorest men are in the bottom of social class and are the most vulnerable groups. They have limited resources to access family planning services. More social efforts and interventions are needed to promote family planning programs among these socially vulnerable populations. Compared to men in manufactural sectors, men in other sectors (including jobless men) are more likely to use modern methods instead of traditional methods. Men working in professional and skilled non-manual sector come mostly from the middle social class and are inclined to start childbearing relatively later than their counterparts, have small family size in a short period of time, and then limit fertility by choosing effective modern methods, particularly sterilization (Padmadas, Hutter, and Willekens, 2004).

Men from rural areas were more likely not to wish to have more children and were less likely to use a contraceptive method; and men in rural areas were more likely use female sterilization instead of traditional methods and less likely use modern methods of contraception than traditional methods compared to men in urban area (see Appendix). The findings are expected because of rigorous implementations of family planning programs in rural areas than urban areas through front line health workers and lower availability of suitable and socially accepted basket of choice of modern method of contraceptive.

One interesting finding is the large geographic variation in fertility stopping intention and the use of contraceptive methods. Men in Central, Eastern, and Northeastern India who did not want another child were less likely to stop having any additional child than their counterparts in Northern India and the former was also less likely to use modern methods and female sterilization relative to traditional methods than the latter. By contrast, men in Western and Southern regions were more likely to not wish to have more children, although such higher odds of wishing to terminate their childbearing were not significant when religious or cultural factors were controlled for. We further found that compared to men in Northern India, men in all other regions were less likely to use any of contraceptive methods than their counterparts, and that men in Central, Eastern, and Northeastern were less likely to use modern and female sterilization methods whereas men in Western and Southern India were more likely to use female sterilization relative to additional methods. The physical access to reproductive health services is generally poor in northern and eastern regions (Singh, Pallikadavath, Ram, *et al.,* 2012). Further, earlier studies demonstrated that Southern States have implemented the family planning programs in most effective manner than other parts of the country (Rajna, Kulkarni and Thenmozhi, 2005), which could explain the higher likelihood of use of female sterilization. However, more studies are needed to focus on age-specific or cohort-specific analyses with integration of other factors that are associated with fertility intention and use of contraceptive methods to further explore regional differences over time.

Although the proportion of men who did not want one more child was higher among Muslims (27.5%) and other religions or no religion (21.3%) compared to that of men of Hindu (20.7%), men of Muslims and men of other religions or no religion had much lower odds to stop having another child when all conditions were equal. Men of Muslim were associated with lower use of contraception, and especially the female sterilization method. These indicate that the demographic or socio-economic composition among different religions is large, and that the family planning practice among Muslims religion is relatively low (De Oliveira, Dias and Padmadas, 2014). The use of family planning methods is lower and unmet need for family planning is higher among Muslims and they have low access to services from government sources in rural areas, as Muslims belonging in low literacy and poor socio-economic condition (Bhagat and Praharaj, 2005; Ghosh, 2018). Compared to men in other religions or no religion, men of Hindu were less than to use a contraceptive method, indicating that religion still play a certain role in influencing people's family planning behaviors (De Oliveira, Dias and Padmadas, 2014). Our finding that men belonging to different religious groups use different contraceptive methods is line with the existing literature. For example, female sterilization was reported to be lowest among the Muslims compared to other religious groups. The fertility behavior and family planning use are very sensitive issue from the religious point of view because it is influenced by deeply rooted socio-cultural values and belief system. Moreover, in some of the communities use of family planning is considered as sinful (Iyer, 2002; Muttreja and Singh, 2018).

Men in SCs/STs and OBCs were associated with lower odds of wishing not to have one more child and less likely to use a contraceptive method compared to men in other groups, although they were more likely to use female sterilization. These findings are consistent with previous studies (De Oliveira, Dias, and Padmadas, 2014). Men from SCs/STs and OBCs are more likely to use female sterilization, this might be because of these group have less or no information related to family planning methods than other caste groups; also public health workers tend to be biased in favor of the wealthier and socially advantage groups to provide the information of health-care services utilization (Singh, Pallikadavath, Ram, *et al*., 2012). Further, in India caste can be consider as a proxy of economic status of the household, therefore, financial

and related opportunity costs might exclude these sections from accessing modern contraceptive methods. Although modern contraceptives are available free of cost in public sectors, family planning services offered through public sectors primarily focus on promoting permanent methods. Incentive provided for female sterilization can also be one of the reasons for higher use of female sterilization as contraceptive use.

Finally, we found that men who had some exposure to social media had higher odds of wishing to stop having an additional child and to use a contraceptive method in comparison with men without social media exposure. These findings indicate that social media exposure could help change people's views and family planning behaviors. The governments, non-governmental organizations, stockholders, and private sectors of family planning should work together to promote significance of family planning and implement some intervention projects.

Like other studies, the present study also has some shortcomings and strengths. First, as this study was based only on currently married young men aged 20-49 who had at least one living child at the time of survey, the information from unmarried men and from other ages were missing. Second, the study was based on a cross-sectional dataset; hence, only associations between predictors and outcome variables were analyzed. Their causal relationships are still unclear. Third, only information on fertility stopping intention was analyzed without any exploration whether the linkages between such intention and subsequent childbearing behaviors. Fourth, data on availability and/or accessibility to family planning services were not included in modeling of use of contraceptive methods; as such we were not able to determine whether the use of a specific contraceptive method (or not-using of any method) was because of husband's (or couple's) decision or because of the unavailability of family planning services. Fifth, relatedly, we only examined factors associated with fertility stopping intention and the use of family planning method from men's perspective, we were also not able to determine or quantify the men's role in decision-making in fertility intention and the use of contraceptive methods.

Despite this shortcoming, the main strength of the paper is that it dealt with the men's fertility stopping intentions and their contraceptive use and choice, an area that has been largely overlooked in the Indian context using the nationally representative data set. The findings of the present study could be vital not only to the Government of India but also to other stakeholders working on the field of family planning to suggest programs that would influence the contraceptive use and decisions among currently married men. Furthermore, the study tried to contribute to the discussion of men's place/status in reproductive health research. More sophisticated studies that overcome above shortcomings for different age groups, birth cohorts using longitudinal studies are clearly warranted to systematically investigate the dynamics of fertility stopping intention and the use of contraceptive methods across space and time.

To regulate population growth, the findings of the study suggest a need for programs that can help in reducing the gender preferences and promote the family planning use. Specifically, intervention programs should target individuals with fewer or no sons and those men who are likely to be young and, by implication, to have high fertility desire, and target individuals who have not yet attained their desired family sizes as well as non-users of family planning to ensure that those who do not desire any more children do not get unwanted pregnancies. Since previous family planning programs and recently launched Mission *Parivar Vikas* for substantially increasing access to contraceptives and family planning services focusing on women in 146 high fertility districts of India, about 87% of the funds available for family planning have been directed toward terminal methods with 95.8% of such amount for female sterilization (Financial Management Report, 2016-2017), which may indicate that funds for promoting male sterilization methods should be increased. Overall, our findings suggest that men are an important target group in fertility regulation interventions.

5. Conclusion

Using the fourth round of the National Family Health Survey conducted in 2015-2016, the present study found that around 78% of currently married Indian men aged 20-49 who already have had at least one child did not want another child. Men in older cohort, having more children, having more sons than daughters, being richer, from Northern India, or having media exposure were more likely not to want another child. However, more than 70% of these men did not use any contraceptive method, which indicates a high level of unmet need family planning among this population. Additional analyses showed that demographic factors, socio-economic characteristics, region and culture, and exposure of social media were all associated with use of a specific conceptive method. More efforts must be focused on strategies to enhance men's awareness of contraceptives by providing them with basket of choice of family planning with proper information on the advantages and disadvantages of specific methods. Furthermore, programs need to target men on the basis of number of children already have and children sex composition. As men's fertility intentions, reproductive preferences, and their attitude toward family planning also influence the fertility behavior of their wives and their attitude toward the use of contraceptives, family planning programs need to target young men precisely at all levels to increase the use of contraception to achieve the country's reproductive health goals and eventually achieve the SDGs-3 and 5.

Conflicts of Interest

The authors have no conflicts of interest to declare.

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Authors' Contributions

Conceived and designed the experiments and analyzed the data: B.G. Chauhan, R. Rawat Wrote the paper: N.N. Tirkey, S.K. Chauhan.

Ethical Approval

Not applicable as this study involves the analysis of secondary data collected by the DHS program (NFHS-4).

Availability of Supporting Data

Data utilized to this paper are from secondary sources and available to the public. The data can be freely accessed from the DHS website https://www.dhsprogram.com/methodology/survey/survey-display-355.cfm.

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Appendix

Table A1. Odds ratios of use of any method versus not using contraceptive method by major study variables in men aged 20-49 who did not have fertility intention for additional child, India, 2015-2016.

Background characteristics	Model 0	Model I	Model II	Model III	Model IV
Demographic characteristics					
Age (in years)					
30-39 (20-29)	1.45***	1.50***	1.47***	1.45***	1.45***
40-49 (20-29)	1.40***	1.54***	1.50***	1.49***	1.49***
Number of living children					
2 (1)	1.41***	1.31***	1.38***	1.39***	1.38***
3 (1)	1.27***	1.17**	1.23***	1.25***	1.24***
4+ (1)	0.93	0.82***	0.90	0.92	0.92
Sex composition of living children					
All daughters (all sons)	0.80***	0.83***	0.90*	0.89*	0.89*
# of sons = # of daughters (all sons)	1.04	1.02	1.01	1.00	0.99
# of daughters > # of sons (all sons)	0.89***	1.02	1.01	0.99	1.00
# of sons > # of daughters (all sons)	0.87***	0.96	0.96	0.97	0.97
Socio-economic characteristics					
Educational attainment					
Primary school (no education)	1.12**		1.03	1.04	1.01
Secondary school (no education)	1.23***		0.98	0.99	0.94
High school or above (no education)	1.41***		1.01	1.01	0.95
Current occupation					
Not working (manual worker)	0.66***		0.67***	0.69***	0.69***
Professional (manual worker)	1.03		0.83***	0.83**	0.83**
Clerical/sales/service (manual worker)	0.90**		0.80***	0.79***	0.79***
Agriculture (manual worker)	0.74***		0.77***	0.77***	0.78***
Wealth quintile					
Poorer (poorest)	1.41***		1.35***	1.38***	1.29***
Middle (poorest)	1.52***		1.45***	1.45***	1.30***
Richer (poorest)	1.57***		1.51***	1.53***	1.36***
Richest (poorest)	2.02***		1.87***	1.86***	1.66***
Current residence					
Rural (urban)	0.93**		1.14***	1.14***	1.14***
Regions					
Central (North)	0.57***		0.68***	0.72***	0.72***
East (North)	0.53***		0.67***	0.68***	0.68***
Northeast (North)	0.90**		1.05	1.01	1.01
West (North)	0.54***		0.55***	0.57***	0.57***
South (North)	0.41***		0.41***	0.44***	0.42***
Religious and cultural factors					
Religion					
Muslim (Hindu)	1.09*			0.90*	0.91*
Others or no religion (Hindu)	1.41***			1.09*	1.10*
Caste					
SCs/STs (others)	0.76***			0.89**	0.89**
OBCs (others)	0.67***			0.82***	0.83***
Social media exposure					
Any social media exposure (no)	1.56***				1.33***
N	NA	36,918	36,863	35,086	35,086
-log likelihood	NA	21,922.47	21,382.86	20,206.5	20,176.52

(1) The odds ratio is based on logistic models. Category is the parentheses is the reference group. (2) SCs/STs: Scheduled Castes/Scheduled Tribes; OBCs: Other backward castes. (3) "N" is different due to missing values in the predictors (caste and occupation). "NA," not applicable. (4) Model 0 refers to results without controlling any other variable. (5) *P < 0.05, **P < 0.01, ***P < 0.001

Table A2. Relative risk ratios of use of modern method versus traditional contraceptive method by major study variables in men aged 20-49 who did not have fertility intention for additional child, India, 2015-2016.

Background characteristics	Model 0	Model I	Model II	Model III	Model IV
Demographic characteristics					
Age (in years)					
30-39 (20-29)	1.17	1.23*	1.12	1.18	1.19
40-49 (20-29)	0.80*	0.88	0.76**	0.82	0.82
Number of living children					
2 (1)	0.98	1.00	1.09	1.04	1.04
3 (1)	0.80*	0.78	0.92	0.88	0.88
4+ (1)	0.62***	0.64***	0.86	0.77	0.77
Sex composition of living children					
All daughters (all sons)	1.06	1.10	1.06	1.04	1.04
# of sons = # of daughters (all sons)	0.94	0.98	0.94	0.93	0.94
# of daughters > # of sons (all sons)	0.79**	1.10	1.08	1.00	1.00
# of sons > # of daughters (all sons)	0.76**	1.03	1.07	1.04	1.04
Socio-economic characteristics					
Educational attainment					
Primary school (no education)	1.33**		1.22	1.34*	1.29*
Secondary school (no education)	1.39***		1.10	1.28*	1.20
High school or above (no education)	1.96***		1.36*	1.50**	1.41*
Current occupation					
Not working (manual worker)	1.47**		1.46**	1.50**	1.49**
Professional (manual worker)	1.60***		1.26	1.43**	1.42**
Clerical/sales/service (manual worker)	1.21*		1.07	1.15	1.14
Agriculture (manual worker)	1.04		1.13	1.22*	1.23**
Wealth quintile					
Poorer (poorest)	1.19		1.09	1.04	0.96
Middle (poorest)	1.53***		1.28*	1.32*	1.16
Richer (poorest)	1.58***		1.23	1.25	1.08
Richest (poorest)	1.85***		1.27	1.22	1.06
Current residence					
Rural (urban)	0.74***		0.81**	0.78**	0.79**
Regions					
Central (North)	0.64***		0.67***	0.60***	0.61***
East (North)	0.77**		0.84	0.76**	0.77**
Northeast (North)	0.80**		0.92	0.77**	0.77**
West (North)	2.16***		2.09***	1.82***	1.82***
South (North)	1.09		1.01	0.84	0.83
Religious and cultural factors					
Religion					
Muslim (Hindu)	1.19*			1.42***	1.44***
Others (Hindu)	0.94			0.87	0.87
Caste					
SCs/STs (others)	0.76***			1.06	1.06
OBCs (others)	0.89*			1.10	1.09
Social media exposure					
Any social media exposure (no)	1.74***				1.42***
N	NA	10,562	10,551	9,900	9,900
-log likelihood	NA	10,563.26	9,742.43	8,898.83	8,889.04

(1) The relative risk ratios based on multinomial logit models after taking using traditional methods as the base group. Category is the parentheses is the reference group. (2) SC/ST: Scheduled Caste/Scheduled Tribes; OBC: Other backward castes. (3) "N" is different due to missing values in the predictors (caste and occupation). "NA," not applicable. (4) Model 0 refers to results without controlling any other variable. (5) *$P < 0.05$, **$P < 0.01$, ***$P < 0.001$

Table A3. Relative risk ratios of use of female sterilization versus traditional method by major study variables in men aged 20-49 who did not have fertility intention for additional child, India, 2015-2016.

Background characteristics	Model 0	Model I	Model II	Model III	Model IV
Demographic characteristics					
Age (in years)					
30-39 (20-29)	1.51***	1.47***	1.54***	1.62***	1.64***
40-49 (20-29)	1.80***	1.79***	1.98***	2.09***	2.12***
Number of living children					
2 (1)	3.73***	3.96***	3.73***	3.86***	3.85***
3 (1)	4.39***	4.65***	4.79***	5.31***	5.32***
4+ (1)	3.29***	3.43***	3.70***	4.40***	4.46***
Sex composition of living children					
All daughters (all sons)	0.54***	0.52***	0.47***	0.42***	0.42***
# of sons = # of daughters (all sons)	1.01	0.78**	0.76**	0.71***	0.72***
# of daughters > # of sons (all sons)	1.01	0.71**	0.63***	0.56***	0.56***
# of sons > # of daughters (all sons)	1.26**	0.85	0.84	0.80	0.81
Socio-economic characteristics					
Educational attainment					
Primary school (no education)	1.21		1.29*	1.25*	1.21
Secondary school (no education)	0.81**		0.84*	0.79**	0.74***
High school or above (no education)	0.58***		0.64***	0.58***	0.54***
Current occupation					
Not working (manual worker)	1.09		1.18	1.21	1.19
Professional (manual worker)	0.72**		0.95	1.04	1.03
Clerical/sales/service (manual worker)	0.81**		0.90	0.98	0.97
Agriculture (manual worker)	1.35***		1.33***	1.36***	1.37***
Wealth quintile					
Poorer (poorest)	0.94		0.91	1.00	0.91
Middle (poorest)	1.23*		1.00	1.15	0.99
Richer (poorest)	1.06		0.84	0.97	0.83
Richest (poorest)	0.89		0.77*	0.82	0.70*
Current residence					
Rural (urban)	1.20**		1.10	1.00	1.02
Regions					
Central (North)	0.79***		0.69***	0.59***	0.59***
East (North)	0.58***		0.50***	0.42***	0.43***
Northeast (North)	0.22***		0.18***	0.15***	0.15***
West (North)	3.35***		3.31***	2.79***	2.79***
South (North)	4.25***		4.76***	4.40***	4.32***
Religious and cultural factors					
Religion					
Muslim (Hindu)	0.39***			0.35***	0.35***
Others or no religion (Hindu)	0.69***			0.86	0.86
Caste					
SCs/STs (others)	1.36***			1.36***	1.35***
OBCs (others)	1.43***			1.21**	1.21*
Social media exposure					
Any social media exposure (no)	1.29***				1.45***
N	NA	10,562	10,551	9,900	9,900
-log likelihood	NA	10,563.26	9,742.43	8,898.83	8,889.03

(1) The relative risk ratios based on multinomial logit models after taking using traditional methods as the base group. Category is the parentheses is the reference group. (2) SC/ST: Scheduled Caste/Scheduled Tribes; OBC: Other backward castes. (3) "N" is different due to missing values in the predictors (caste and occupation). "NA," not applicable. (4) Model 0 refers to results without controlling any other variable. (5) *P < 0.05, **P < 0.01, ***P < 0.001