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Contraceptive use and unmet need for family planning among women with at least one child in rural Uttar Pradesh: the role of wealth and gender composition of children

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Abstract

Aim Family planning has long been recognised as an effective public health intervention to reduce fertility and unwanted births. This study examines the effect of household wealth and gender composition of children on contraceptive use and unmet need for family planning.

Subject and methods Our study is based on primary data collected from 460 respondents in the rural areas of the Rae Bareli district of Uttar Pradesh between September 2016 and February 2017. The representative sample comprised 460 currently married women who had at least one living child below 10 years of age. Current use of contraception and an unmet need for family planning were the outcomes variables. Descriptive statistics, a concentration curve and index for inequality, and multivariate techniques were used to examine the association between predictor and outcome variables.

Results Our study showed low prevalence and substantial socio-economic differentials in contraceptive use. An unmet need for family planning was concentrated among the poor and the use of contraception was found to be more frequent among affluent women. Household wealth and gender composition of children were significantly associated with contraceptive use and unmet need for family planning.

Conclusion There are substantial differentials in contraceptive use and unmet need for family planning in rural Uttar Pradesh. In addition to promoting family planning, there is a need to create an atmosphere to reduce son preference, increase the acceptance of girl babies and remove economic inequalities.

Keywords Contraceptive use · Unmet need for family planning · Wealth · Gender composition of children · Uttar Pradesh

Background

More than 200 million women in developing countries still have unmet needs for modern contraception (Bongaarts et al. 2012). Such women face various problems including lack of access to information and health care services, restrictions imposed by their husbands or partners and societies in general and misconceptions about side effects and costs (Gold 2009). Family planning has long been recognized as an effective public health intervention to reduce fertility and unwanted births. In most of the developing countries, the use of contraception is below the satisfactory level, even though India itself has played a leading role in adopting an official nation-wide planning programme in 1952. Family planning is documented as one of the most significant issues not only to control population growths but also as a subject which concerns the health and lives of women and children. Increasing the contraceptive prevalence rate is one of the most important steps needed to reduce fertility in India. The Fifth Five Year Plan (1974–78) gave huge impetus to sterilization, but due to loopholes in the approach adopted for the programme and the excessive commitment of the government in forcing people to accept sterilization, it suffered a serious setback in 1977, becoming contentious and practically collapsing in 1977/78. After that, India adopted the "cafeteria approach" with a basket of

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choices to increase the prevalence of family planning use among eligible couples in the early eighties. In the beginning, these endeavours were coordinated under the National Family Planning Programme which was renamed in 1977 as the National Family Welfare Programme. In 1996, the programme became known as Reproductive and Child Health (RCH) programme and given a new orientation to better meet the health needs of women and children. Today the scheme aims to cover all aspects of women's reproductive health throughout their lives, especially with regard to family planning. The new approach emphasizes the target-free promotion of contraceptive use among eligible couples with provision for them to choose contraceptive methods themselves while high quality care is assured.

In 2005, India launched the National Rural Health Mission (NRHM). After that, the official family planning programme was incorporated in the reproductive and child health component of the mission (Chaurasia and Singh 2014). Even though Indian policies related to population control have changed over time, the main demographic aims of diminishing fertility and stabilizing the population have remained as its chief characteristics (Pachauri 2004). The short-term objective of the National Population Policy 2000, launched in the same year, was to address unmet contraceptive needs and bring India's total fertility rate (TFR) to replacement level (2.1) by 2010. Its long-term objective was to achieve population stabilization by 2045 (MOHFW 2000). Many state governments have also formed individual population policies. Recognizing the significance of the rapidly increasing population and the high infant and child mortality rates, the Government of Uttar Pradesh adopted its own state-specific population policy in 2000, setting out the goal of achieving replacement fertility level of 2.1, increasing contraceptive prevalence to 52%, and decreasing the unmet need to 10% by 2016 (GoUP 2000). However, the evidence suggests that achieving these population policy targets remains a distant dream for Uttar Pradesh.

There are many socio-economic, demographic and cultural factors which influence the utilization of contraception and unmet need for family planning (Olaleye and Bankole 1992; Rajaretnam and Deshpande 1994; Singh and Yadava 1997; Navaneetham and Dharmalingam 2002; Sahoo 2007; Sharma and Rani 2009; IIPS Mumba 2010; Rahman et al. 2014; Patrikar et al. 2014; Singh and Joshi 2017). One of the underlining reasons for the low use of contraception is a preference for sons, namely, the attitude that a male child is more important and valuable than a female child. This gender bias leads to high fertility and imbalance gender ratios in India and its states (Arnold 1987; Rajaretnam and Deshpande 1994; Kesarwani and Yadav 2012). A preference for sons over daughters has been found to have far-reaching implications for current social and economic norms including for religious roles that only a son can perform, inheritance of property by sons only and also continuing the family name. Further, a female child is considered an economic burden for the family. She suffers discrimination compared with male siblings in many regards. The number and gender of living children have considerable influence on contraceptive use (Kulkarni and Choe 1998) and son preference is much higher in Uttar Pradesh than the socio-economically advanced states like Kerala (Gulati 1996).

The standard of living of the household has a positive relationship with the use of family planning (Kanitkar and Murthy 1983; Dwivedi 1992; Majumder and Ram 2015). Large-scale, multi-country studies have also found noticeable differences in the coverage gap in contraceptive use and maternal and child health that are associated with the economic status of the population (Boerma et al. 2008; Barros et al. 2012). The difference between the wealthy and the poor in the use of contraception has endured, notwithstanding global improvements in socio-economic status and the expansion of family planning services (Gakidou and Vayena 2007). In less developed countries, a wide gap in the contraceptive prevalence rate can be observed between the richest and poorest wealth quintiles (World Population Data Sheet 2009).

The lack of understanding surrounding what influences contraceptive practice and how decision-making takes place in families has led to policies and programmes falling to focus on the factors that are important to help people control their fertility. Further, household and national level surveys show that contraceptive use in India is highly skewed towards terminal methods rather than spacing, which means that contraception in India is practised mainly for birth control rather than birth planning. It is also clear that son preference is still an important issue affecting acceptance of contraception. Differentials in contraceptive use and the unmet need for family planning may be further compounded by the social and economic categories of couples. Therefore, there is a need for a better understanding of the role of gender composition of children and wealth on contraceptive use and unmet needs for family planning. Our study uses recently collected primary data to fill this important gap. Its main objective is to investigate the prevalence of contraceptive use and unmet need for family planning among currently married women with at least one child below 10 years of age in rural Uttar Pradesh. Apart from this, an attempt is also made to understand the effect of wealth and gender composition of children on contraceptive use and unmet needs for family planning.

Data and methods

Data

This study is based on primary data collected by the first author from interviews conducted with a total of 460 women in the rural areas of the Rae Bareli district of Uttar Pradesh

between September 2016 and February 2017. The reason for selecting the Rae Bareli district was that as per Annual Health Survey (AHS) 2012–13, its total fertility rate (3.3) was exactly that of the state average of 3.3 children per woman (AHS, 2012–13 fact sheet, UP). Furthermore, it has similar socio-economic and demographic characteristics to the state as a whole. Since 90% of the population resides in rural areas, it is also appropriate to concentrate on the rural population.

Following the multi-stage, stratified random sampling technique, two sub-districts were selected on the basis of the median level of the proportion of the population aged 0–6 years as primary stage units. The reason behind their selection was to maintain heterogeneity in the data. Within the primary stage units, ten villages were then randomly picked (five villages from each sub-district) as secondary stage units. Within the selected villages, the sample was drawn based on the proportion of households for equal representation. House listing and mapping activities were carried out to identify eligible households. Only those households with a currently married women living with at least one child below 10 years of age were selected for the interview and only one currently married woman from each household could be chosen. In the case of more than one suitable woman residing in the household, KISH grid was applied for picking out one person for interview from among the household residents (Kish 1949).

Outcome variables

Outcomes variables of the study were the current use of contraception and unmet need for family planning, chosen to explore whether women or their husbands with at least one child below 10 years of age used any method of contraception to avoid another pregnancy. The current use of contraception variable comprised two categories–using and not using. Coding was determined by asking respondents whether they or their husbands did anything to avoid or delay getting pregnant. Those who responded "no" were coded as a 'non-user' and those who responded "yes" as a 'user'.

The second outcome was the unmet need for family planning. Those women who were not currently using any method of contraception, not pregnant and not wanting another child were considered as having an unmet need for family planning. An unmet need for family planning is significant from a policy perspective because it is a critical indicator for programme preparedness and effectiveness, and essential for understanding potential demand for family planning services. In general, the lower the unmet need for family planning services, the higher the success of the programme. However, an efficient programme itself may further generate demand for family planning.

Predictor variables

The women's socio-economic and demographic variables were part of the analysis, including age (<=25 years, 26– 35 years, and 36 years and above); caste (scheduled castes/ scheduled tribes, other backward caste (OBC), and general caste); religion (Hindu and non-Hindu); education (none or up to primary, middle, secondary or higher); husband's education (none, up to primary, middle, secondary or higher); number of living children (1 child, 2, 3, or 4 or more children); media exposure (no exposure and any media exposure); age at marriage (<20 years, 20–21 years, and 22 years and more); type of family (nuclear or joint); religiosity (religious or not religious); gender composition of children (no son, one or more daughters; no daughter, one or more sons; equal number of daughters and sons; both sons and daughters, but more daughters than sons; and both sons and daughters, but more sons than daughters); wealth status of the household (poor, middle or rich); women's autonomy (low or high); and modernity index (low, medium or high).

The wealth index was created based on 30 household assets and housing characteristics using principal component analysis (Filmer and Pritchett 2001). The women's autonomy index was calculated from information about decision-making (their involvement with regard to major and daily household purchases, visiting family or relatives, going to health facilities and spending husband's money), mobility (being allowed to go out to the market, and outside the village/community) and finances (economic security in terms of having their own money and the ability to spend it). A higher score was allocated if a woman was involved in decision-making, did not require permission to go out and had economic security (high vs. low autonomy). The modernity index was computed on the basis of five attitudinal questions which the respondents were asked, i.e. (a) How much importance should be given to the children's opinion in social matters? (b) How much importance should be given to the children's opinion in family matters? (c) Should a husband help his wife with the housework? (d) Should an unmarried girl who wants to work be allowed to take a job outside her home? and (e) Should a girl's opinion about her marriage be taken into consideration? For religiosity, women were asked: How frequently do you visit a religious place for worship/how frequently do you worship? Four expected responses were (a) almost every day, (b) at least once a week, (c) at least once a month, and (d) rarely. For analytical purposes, this variable was again recoded, classifying the first two categories as "religious" and the last two as "not religious".

We evaluated the data using STATA 13 software and Microsoft Excel. Univariate analysis was carried out to calculate frequencies and percentages. The chi-square test was applied to determine any association between women's socio-economic and demographic characteristics and outcome variables. Binary logistic regression was used to examine the relationship between predictor and outcome variables. To measure the magnitude and degree of economic inequality, a concentration curve and index were calculated using an excel

spread sheet programme. The concentration index, a measure of socio-economic inequality used to capture overall inequalities in desired outcomes across different wealth quintiles (Kakwani et al. 1997), was defined as twice the area between the concentration curve and the line of equality. It varied between −1 and + 1. The closer the value was to 1 (absolute), the more unequal the outcome measure; in cases where there was no income-related inequality, the concentration index was zero (O'Donnell et al. 2008).

Results

Table 1 presents the socio-economic and demographic characteristics of the 460 women interviewed. One-third of them were not educated or had only completed schooling up to the primary level. Less than one-fifth of the women had higher education, as had their husbands. About one-fifth of women interviewed (21.1%) were non-Hindus and around 43% from OBCs. Twenty-one per cent of the women in the sample had at least one child and less than one fifth had four or more children. Among the respondents, only 16% had high autonomy, and 54% had medium modernity. As expected, about 33% of women were in each of the three wealth categories. Overall, 21% of women had no sons, but one or more daughters; 23.3% had no daughters, but one or more sons; 24.1% had an equal number of sons and daughters; 14.1% had both sons and daughters, but more daughters than sons; and 17.4% had both sons and daughters, but more sons than daughters.

To identify the factors associated with the current use of contraception and unmet need for family planning, bivariate differentials of selected socio-economic and demographic characteristics were examined (Table 2). Overall, 37.6% of respondents currently used any method of contraception and 21% of women reported an unmet need for family planning (not using any method of contraception, not currently pregnant and not wanting another child). Contraceptive use was higher (46.9%) among women with an equal number of sons and daughters, and it was lower (29.9%) among women who reported no son and one or more daughters. Further, two out of five women currently used contraception, if they had both sons and daughters, but more daughters than sons. Only 35% of women used contraception if they had both sons and daughters, but more sons than daughters. The findings revealed that the unmet need for family planning was low (10.3%) if women had no daughters, but one or more sons. Women having both sons and daughters, but more daughters than sons, and both sons and daughters, but more sons than daughters, reported a 33% unmet need for family planning. These differences are significant and indicate that unmet need for family planning differs by the gender composition of the children. Only one-quarter of women belonging to the poor wealth category currently used contraception, and more than

half using contraception belonged to the rich category, while the prevalence of unmet need for family planning was higher in the poor group (30%) and lower among those who were rich (9.2%).

The current use of contraception and unmet need for family planning was higher among those women who belonged to the 26–35-year age group. Contraceptive use was lower (35.1%) and unmet need for family planning was higher (22.7%) among non-Hindu respondents compared to Hindu respondents. Current use of contraception was higher (45.7%) among women belonging to OBCs and as expected, the unmet need for family planning was low (16.4%) among women belonging to the general caste group. Current use of contraception and unmet need for family planning were positively associated with women's education. They were also higher among women who had three living children. Women's autonomy was also positively associated with contraceptive use, but was negatively associated with unmet need for family planning. Modernity and exposure to media were significantly positively associated with current use of contraception and unmet need for family planning, with two out of five women belonging to the higher modernity index currently using contraception.

Figure 1 shows the magnitude and degree of economic inequality in contraceptive use and unmet need for family planning among women in rural Uttar Pradesh. The concentration index value for contraceptive use was 0.16 and − 0.22 for unmet need for family planning. It shows that the concentration curve for unmet need for family planning lies above the line of equality, indicating that unmet need for family planning is concentrated among the poor rather than the better-off, and that current use of contraception is more common among affluent women.

To understand the effect of gender composition of children and wealth status of the household on current use of contraception and unmet need for family planning, unadjusted and adjusted odd ratios were estimated using a logistic regression model. Unadjusted results show that both factors have a significant effect on contraceptive use and unmet need for family planning (Table 3). Women with an equal number of sons and daughters (OR = 2.067, CI = 1.166–3.664) and women who had both sons and daughters, but more daughters than sons (OR = 1.563, CI = 0.808–0.324) were significantly more likely to use contraception compared with women who had no sons, but one or more daughters. For unmet need for family planning, women who had both sons and daughters, but more daughters than sons (OR = 3.033, CI = 1.412–6.516), and women who had both sons and daughters, but more sons than daughters (OR = 3.020, CI = 1.453–6.278) were more likely to have unmet need for family planning than women who had no sons but one or more daughters. Unadjusted results for contraceptive use broadly indicated that gender composition of children exerted a significant effect on current use of

Table 1 Percentage distribution of women by socio-economic and demographic characteristics in rural Uttar Pradesh

Characteristic	Total sample	Percentage
Age in years		
<=25	122	26.5
26–35	260	56.5
36+	78	17.0
Caste		
SC/ST	191	41.5
OBC	202	43.9
General	67	14.6
Religion		
Hindu	363	78.9
Non-Hindu	97	21.1
Woman's education		
None or up to primary	261	56.7
Middle or secondary	113	24.6
Higher	86	18.7
Husband's education		
None or up to primary	189	41.1
Middle or secondary	175	38.0
Higher	96	20.9
Number of living children		
1	98	21.3
2	162	35.2
3	115	25.0
4 or more	85	18.5
Autonomy index		
Low autonomy	385	83.7
High autonomy	75	16.3
Modernity index		
Low modernity	81	17.6
Medium modernity	249	54.1
High modernity	130	28.3
Media exposure		
No media exposure	251	54.6
Any media exposure	209	45.4
Age at marriage, in years		
<20	309	67.2
20–21	96	20.9
22+	55	12.0
Type of family		
Nuclear	312	67.8
Joint	148	32.2
Religiosity		
Religious	137	29.8
Not religious	323	70.2
Wealth status of household		
Poor	154	33.5
Middle	153	33.3
Rich	153	33.3

Table 1 (continued)

Characteristic	Total sample	Percentage
Gender composition of children		
No son, one or more daughters	97	21.1
No daughter, one or more sons	107	23.3
Equal number of sons and daughters	111	24.1
Both sons and daughters, but more daughters than sons	65	14.1
Both sons and daughters, but more sons than daughters	80	17.4
Total number of respondents	460	100

SC/ST scheduled caste/scheduled tribe, *OBC* other backward caste

contraception, i.e., having a son or sons increased contraceptive use substantially compared to having only daughters.

The wealth category showed a significant positive effect on current use of contraception. Women from the middle and rich wealth categories (OR = 1.467, CI = 0.898–0.399 and OR = 3.206, CI = 1.984–5.182 respectively) were more likely to use contraception compared with women from the poor wealth group. In unmet need for family planning, the wealth category showed a significant negative effect. Women from the middle and rich wealth categories were 26% (OR = 0.749, CI = 0.452–1.242) and 77% (OR = 0.236, CI = 0.124–0.452) respectively less likely to have unmet need for family planning compared with women from the poor wealth group. After adjusting for other factors, the effect of gender composition of children and wealth status of the household significantly influenced the outcome variables in the expected direction, i.e. wealth status both increased contraceptive use and reduced unmet need for family planning (Table 4).

Our analysis also revealed that women's education, caste, religion, number of living children, economic status of household, women's autonomy, and modernity were significant determinants of current use of contraception and unmet need for family planning (Table 4). Women's education emerged as a vital determinant of contraceptive use. Women with middle or secondary education and those with higher education were 1.8 times (CI = 1.028–3.481) and 1.7 times (CI = 0.805–3.598) respectively more likely to use contraception as compared with uneducated or primary-educated women. Further, as the number of living children increased, the odds of current use of contraception also increased. Women with two children and three children were 2.2 times (CI = 1.070–4.681) and 6.1 times (CI = 2.346–15.910) respectively more likely to use contraception than those with just one child. The odds ratio of current use of contraception was greater among women who had high autonomy compared with those women who had low autonomy (OR = 1.691, CI = 0.932–3.066). In contrast to women with low modernity, current use of contraception was found to be more likely among women from the medium (OR = 1.751, CI = 0.925–3.314), followed by

Table 2 Current use of contraceptives and unmet need for family planning by socio-economic and demographic characteristics of women in rural Uttar Pradesh

Characteristic	Contraceptive use	Unmet need for FP	N
Total sample (N)	173	97	460
Gender composition of children	(7.086) ns	(24.167)***	
No son, one or more daughters	29.9	14.4	97
No daughter, one or more sons	35.5	10.3	107
Equal number of sons and daughters	46.8	20.7	111
Both sons and daughters, but more daughters than sons	40	33.8	65
Both sons and daughters, but more sons than daughters	35	33.7	80
Wealth status of household	(25.068)***	(21.121)***	
Poor	26	29.9	154
Middle	34	24.2	153
Rich	52.9	9.2	153
Women's age in years	(2.171) ns	(6.513)**	
<=25	35.3	13.1	122
26–35	40.4	23.5	260
36+	32.1	25.6	78
Caste	(13.479)***	(1.029) ns	
SC/ST	27.4	21.9	191
OBC	45.7	21.8	202
General	36	16.4	67
Religion	(17.089)***	(2.335) ns	
Hindu	38.3	20.7	363
Non-Hindu	35.1	22.7	97
Woman's education	(7.592)***	(6.713)**	
None or up to primary	32.2	25.3	261
Middle or secondary	44.25	14.2	113
Higher	45.35	17.4	86
Husband's education	(3.242) ns	(5.919)**	
None or up to primary	33.9	24.8	189
Middle or secondary	37.7	21.7	175
Higher	44.8	12.5	96
Number of living children	(12.131)*	(41.3249)***	
1	23.5	2.1	98
2	41.4	17.3	162
3	46.1	33	115
4 or more	30	34.1	85
Autonomy index	(0.977) ns	(0.971) ns	
Low autonomy	36.6	20.26	385
High autonomy	42.7	25.33	75
Modernity index	(2.707)*	(6.416)**	
Low modernity	29.6	30.9	81
Medium modernity	39	17.7	249
High modernity	40	21.5	130
Media exposure	(11.311)***	(11.970)***	
No media exposure	30.7	27.1	251
Any media exposure	45.9	13.8	209
Age at marriage, in years	(3.346) ns	(5.670)*	
< 20	37.5	23.3	309
20–21	32.3	20.8	96

Table 2 (continued)

Characteristic	Contraceptive use	Unmet need for FP	N
22+	47.3	9.1	55
Type of family	(0.019) ns	(7.521)***	
Nuclear	37.8	24.6	312
Joint	37.2	13.5	148
Religiosity	(0.282) ns	(0.945) ns	
Religious	35.8	18.2	137
Not religious	38.4	22.1	323
Total	37.6	21.1	

Note: Figures in parentheses are chi-square statistics; chi-square test applied for each variable

Levels of significance: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$; ns = not significant

FP = family planning; SC/ST = scheduled caste/scheduled tribe; OBC = other backward caste

N = total sample

women from high modernity category (OR = 2.152, CI = 1.072–4.320).

We can see that an unmet need for family planning was significantly associated with religion, women's and husbands' education, number of living children, wealth status of the household, women's autonomy, modernity and religiosity. Women with higher education were three times more likely (OR = 3.163, CI = 1.152–8.684) to have an unmet need for family planning compared with uneducated or primary-educated women. The number of living children was also found to be significant and positively associated with an unmet need for family planning. The odds ratio for unmet need for family planning was higher among women who had high autonomy compared with those who had low autonomy (OR = 2.022, CI = 0.992–4.122). Another significant finding was the effect of modernity on unmet need for family planning. Compared with women with low modernity scores, an unmet need for family planning was found to be less likely among women from the medium modernity category (OR =

0.381, CI = 0.182–0.798), followed by women in the high modernity group (OR = 0.401, CI = 0.181–0.890).

Discussion and conclusion

The present study examines the current use of contraception and unmet need for family planning among women who had at least one living child less than 10 years of age. Its objective was to investigate the effect of wealth status and gender composition of children on contraceptive use and unmet need for family planning among married women in rural Uttar Pradesh.

It is an accepted fact that the gender composition of children is a significant determinant of reproductive behaviour in South Asia in general (Hussain et al. 2000). Preferring male offspring over daughters is a well-documented phenomenon in Uttar Pradesh as well. The reasons are deeply rooted in social, cultural and religious traditions. When women do not have a daughter but one or more sons, or have an equal

Fig. 1 Concentration curve showing inequality in contraceptive use and unmet need for family planning in rural Uttar Pradesh. Note: FP = family planning
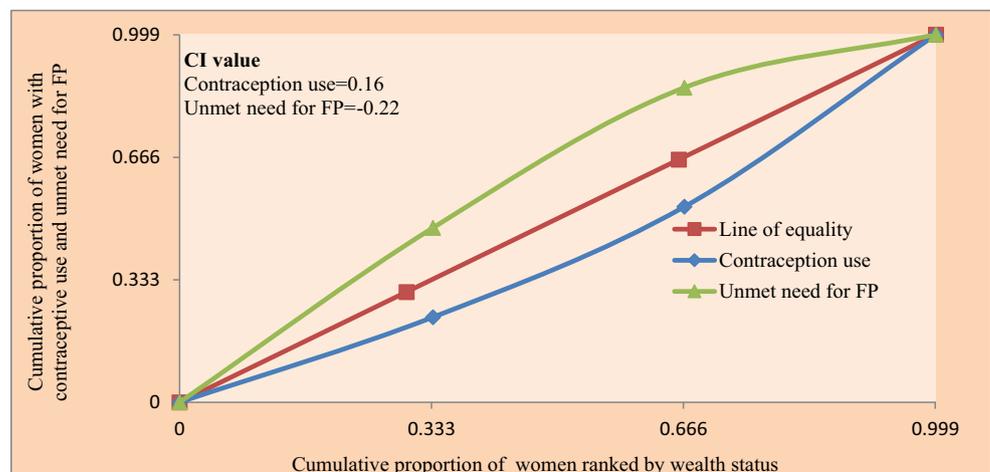
Table 3 Binary logistic regression model showing unadjusted odds ratios and confidence intervals for current use of contraceptives and unmet need for family planning among women in rural Uttar Pradesh

Covariate	Contraceptive use			Unmet need for FP		
	OR	[95% CI]		OR	[95% CI]	
Gender composition of children						
No son, one or more daughters®						
No daughter, one or more sons	1.291	0.717	2.325	0.679	0.293	1.578
Equal number of sons and daughters	2.067***	1.166	3.664	1.550*	0.748	3.212
Both sons and daughters, but more daughters than sons	1.563*	0.808	3.024	3.033***	1.412	6.516
Both sons and daughters, but more sons than daughters	1.263	0.671	2.377	3.020***	1.453	6.278
Wealth status of household						
Poor®						
Middle	1.467*	0.898	2.399	0.749*	0.452	1.242
Rich	3.206***	1.984	5.182	0.236***	0.124	0.452

Note: FP = family planning; OR = odds ratio; CI = confidence interval; ® = reference category

Levels of significance: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

number of sons and daughters, they are significantly more likely to use contraception than those without sons but one or more daughters. The findings of this study are in agreement with those conducted elsewhere in South Asia (Rahman et al. 1992; Hussain et al. 2000). The likelihood of using contraception is lower if women have both sons and daughters, but more daughters than sons compared with those women who have both sons and daughters, but more sons than daughters. As expected, for women with more children of both sexes, the unmet need for family planning is higher than for women with no sons but one or more daughters. This suggests that once women have the number of boys they desire; they are more likely to use contraception. These findings are consistent with other studies in India which show that women with several sons are more likely to be contraceptive users (Arnold et al. 1998; Jayaraman et al. 2009). Findings of this study also suggest that son preference persists in rural Uttar Pradesh and people desire a gender mix of children that includes both males and females. There is no significant differential in gender composition of children and unmet need for family planning. Women with both sons and daughters, but more daughters than sons and women with both sons and daughters, but more sons than daughters, both gave a similar response. This means that women did not stop having children until they had reached the desired gender composition.

The wealth status of the household was also found to be a significant factor that affects contraceptive use. The use of contraception increases the higher the wealth status of a household. Studies conducted elsewhere in India and other parts of the world have come to similar conclusions (Sahoo 2007; Nketiah-Amponsah et al. 2012; Speizer et al. 2012). The results clearly show the impact of multiple inequalities that exist across groups as affecting contraceptive use. Socio-

economic status, for example, affects access to modern health care services and education (Currie 2009; Wang et al. 2012). Also, previous studies have reported that the rich-poor gap in the utilization of contraception and unmet need for family planning has widened, and that government programmes are failing to reach the poor sections of society (Mohanty and Pathak 2009; Pathak and Mohanty 2010; Rai and Chauhan 2014). This is probably because poor households do not have the resources for health care expenses as their natural inclination is to meet their basic daily needs first, whereas wealthier families can spend a higher proportion of their earnings on health care. The study also shows that a lower percentage of women in the richest wealth group have an unmet need for family planning than their counterparts in the poor category. This could indicate that poorer women want to use family planning methods to regulate their fertility but face financial hurdles, particularly when such services are not free, or the service providers are at locations far from where the women who intend to utilize them live.

In concurrence with other studies, we found that contraceptive use is highest among women aged 25–34 years (Khan et al. 2007; Rahman et al. 2008). In general, this is because the expected number of children is not achieved at a younger age, and older women are less concerned about using contraceptives due to onset of menopause, infrequent sex and not having sex (Monteith et al. 1985). The educational level of the women is also positively associated with contraceptive use in rural Uttar Pradesh. More education might give married women a better knowledge of family planning and the advantages of birth spacing, and educated women are also able to learn about different types of contraceptive methods and which one suits them the best (Fanslow et al. 2008). Our study found that contraceptive use is the highest among women belonging to

Table 4 Binary logistic regression model showing adjusted odds ratios and confidence intervals for current use of contraceptives and unmet need for contraceptives among women in rural Uttar Pradesh

Covariate	Contraceptive use			Unmet need for FP		
	OR	[95% CI]		OR	[95% CI]	
Gender composition of children						
No son, one or more daughters®						
No daughter, one or more sons	1.971**	0.965	4.025	0.742	0.263	2.099
Equal number of sons and daughters	1.993**	0.962	4.129	1.004	0.405	2.487
Both sons and daughters, but more daughters than sons	0.758	0.306	1.88	1.11	0.402	3.062
Both sons and daughters, but more sons than daughters	0.679	0.283	1.63	1.516	0.563	4.084
Wealth status of household						
Poor®						
Middle	1.593*	0.885	2.87	0.822	0.446	1.516
Rich	3.212***	1.739	5.935	0.286***	0.13	0.631
Age, in years						
<=25®						
26–35	1.007	0.56	1.81	0.947	0.441	2.033
36+	0.552	0.243	1.25	0.781	0.292	2.091
Caste						
SC/ST®						
OBC	2.188***	1.306	3.664	0.789	0.434	1.435
General	1.274	0.61	2.659	1.082	0.439	2.663
Religion						
Hindu®						
Non-Hindu	0.768	0.437	1.348	5.416***	2.677	10.96
Woman's education						
None or up to primary®						
Middle or secondary	1.891**	1.028	3.481	0.999	0.46	2.168
Higher	1.702	0.805	3.598	3.163**	1.152	8.684
Husband's education						
None or up to primary®						
Middle or secondary	0.977	0.571	1.671	0.673	0.364	1.243
Higher	0.945	0.479	1.862	0.448*	0.17	1.184
Number of living children						
1®						
2	2.238***	1.07	4.681	11.043***	2.341	52.083
3	6.110***	2.346	15.91	23.661***	4.417	126.759
4 or more	4.182***	1.504	11.628	28.336***	5.147	156.008
Autonomy index						
Low autonomy®						
High autonomy	1.691**	0.932	3.066	2.022**	0.992	4.122
Modernity index						
Low modernity®						
Medium modernity	1.751*	0.925	3.314	0.381***	0.182	0.798
High modernity	2.152**	1.072	4.32	0.401**	0.181	0.89
Media exposure						
No media exposure®						
Any media exposure	1.275	0.766	2.123	0.67	0.349	1.284
Age at marriage, in years						
<20®						

Table 4 (continued)

Covariate	Contraceptive use			Unmet need for FP		
	OR	[95% CI]		OR	[95% CI]	
20–21	0.833	0.464	1.495	1.555	0.765	3.161
22+	1.305	0.634	2.686	0.608	0.199	1.852
Type of family						
Nuclear®						
Joint	0.79	0.482	1.296	0.67	0.355	1.264
Religiosity						
Religious®						
Not religious	1.354	0.812	2.256	1.669*	0.881	3.164

Note: FP = family planning; OR = odds ratio; CI = confidence interval; ® = reference category; SC/ST = scheduled caste/scheduled tribe; OBC = other backward caste

Levels of significance: *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

OBCs, similar to another study's results (Rajpurohit et al. 2014). In Uttar Pradesh, caste may be considered broadly as a proxy for socio-economic status. Scheduled castes/ Scheduled tribes (SCs/STs) are normally socially and economically disadvantaged in this society. Further, we found that those women who had media exposure were more likely to use contraception, as previous studies have also cited (Islam et al. 2009; Kulkarni 2003; Kiragu et al. 1996). In our study, women with high autonomy were more likely to use contraception. Other studies conducted in diverse settings and with different perspectives have similar findings (Woldemicael 2009; Renuka and Jeyarathnam 2016). In Uganda, one study found that when couples agree to joint decision-making, this affects the utilization of modern contraceptive and that when women are more empowered in this respect, they are more likely to practice contraception (DeRose and Ezeh 2010).

The low likelihood of contraceptive use among married women aged 20–21 years might be attributable to their shorter experience of conjugal life. Presumably, these women intend to initiate child-bearing or have more children, resulting in their reluctance to use contraceptives. During the first few years of marriage, we found contraceptive use to be very low and consistent with the finding of an earlier study (Pandey and Singh 2015).

Our findings also indicated that modernity was significantly associated with contraceptive use and unmet need for family planning. This may be because women with high modernity scores are more educated and empowered. Women from nuclear families are more likely to use any method of contraception than those from joint families. This may be because they have more freedom to decide their family size than their counterparts, whose 'decision' is often influenced by other family members, mainly in-laws.

In the studied context, the use of contraception is low and the unmet need for family planning is high. Thus, to make a

substantial impact on contraceptive adoption among women in patriarchal societies such as in Uttar Pradesh, there is a need to expand the focus beyond recommendations for improving female education, autonomy and media exposure and to undertaking a critical examination of the existing social structure. Extra efforts are required to decrease the unmet need for family planning among women as an indicator of progress towards one of the United Nations Sustainable Development Goals, namely Good Health and Well-Being (SDG-3). Making access to family planning services easier for couples in rural areas would help the programme to achieve its desired goal of increased contraceptive use and reduced unmet demand for the same. The study findings also indicate that there is less use of contraception by couples until they produce a son. This continuing patriarchal norm of favouring male offspring ultimately leads to increased fertility. Hence, efforts are necessary to increase the acceptance of daughters through programmes and advocacy.

This study has a few limitations. Contraceptive use was self-reported and may suffer from recall bias. As this study was conducted in rural Uttar Pradesh, traditionally a backward state, the respondents may be likely to underreport the use of contraception, or believe non-use to be the desired response. Additionally, cross-sectional data was utilized for analysis. This allowed for the examination of associations between variables, but did not permit an assessment of the direction of causality. Also, owing to the unavailability of data on direct income and expenditure, this study defines economic status on the basis of household ownership and consumer assets only.

Ethical considerations

Ethical approval for this study was granted by the Students Research Ethics Committee (SREC) of the International Institute for Population Sciences, Mumbai. Oral consent was

secured from the participants before their involvement in the study. They were also assured that the information provided by them would be kept confidential and used for research purposes only. They were also informed about the purpose of the study.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict interest.

Consent for publication Not applicable.

Availability of data The datasets generated and/or analyzed during the current study are not publicly available because this study was based on primary data collected during the course of the first author's doctoral thesis. It can, however, be made available on reasonable request.

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