

Multinomial Logistic Regression of Contraceptive's Determinants and Unmet Need for Family Planning among Currently Married Women in India

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ABSTRACT

Background: India is the first nation of the world to formulate the national family welfare programme in 1952 with the objective of reducing the birth rate for population stabilization. More than 100 million women in less developed countries or about 17% of all married women would prefer to avoid pregnancy but are not using any form of family planning. Despite the government's many efforts, the unmet need for family planning in India is still 12.8%. The present study is aimed to assess prevalence of the unmet need for family planning, its determinants, and to analyze the relationship between use contraceptive method and unmet need for family planning among Currently Married Women in India. **Materials and Methods:** The present study uses 139,278 currently married women from urban residence selected from the fourth round of national family health survey conducted during 2015-2016 in the country. Descriptive and multivariate analysis have been used to study the prevalence of unmet need for family planning and to examine the relationship between contraceptive method with its determinants among currently married women in India. **Results:** Study shows that total unmet need for family planning are 12% (i.e. 5% for spacing and 7% for limiting) among currently married women. Women of aged 15-19 are 21% unmet need for contraception in which 19% and 2% unmet need for spacing and for limiting respectively. Women with primary and higher educated are 13% and 32% more likely to choose modern and traditional method respectively over non-use compared to women having no education. **Conclusion:** Improved access to family planning services, better education, improved standard of living, and higher exposure to mass media can significantly decrease the unmet need of family planning.

Keywords- multivariate analysis, unmet need, family planning, contraceptive method, health education.

reproductive intentions and their contraceptive behavior. Contraception is considered as the direct method to regulate fertility. Hence, promoting contraception uses is government effort for most of the high fertility countries. India is the first nation of the world to formulate the national family welfare program in 1952 with the objective of reducing the birth rate for population stabilization. The program has experienced a significant growth in terms of financial support, service delivery, and range of contraceptive methods offered, since from its inception. (Santhya, 2003).

Worldwide, prevalence of contraceptive use has increased from 54 per cent in 1990 to 64 percent in 2015 (united nation 2002; united nation 2015). The increase in rate of use was much slower in the developed regions (66% in 1990 to 70% in 2000) than in the less developed regions (52% in 1990 to 61% in 2000) (United nation 2002). Contraceptive prevalence among married or cohabiting women has risen from 36 percent in 1970 to 63 percent in 2010. In India, uses of contraception have been increased significantly due to government effort and program interventions. It has increased from 13 percent in 1970 to 41 percent in 1992-93 (NFHS-1), 48 percent in 1998-99 (NFHS-2) and 56 percent in 2005-06 (NFHS-3) but had decreased slightly to 54 in nfhs-4 (2015-2016) (IIPS and macro international 2007; IIPS and ICF 2017) among currently married women by any methods. The contraceptive prevalence among married women has increased from 41% in 1992-93 to 56% in 2005-06 and same was observed in 2015-16 in case of India (IIPS and macro international 2007; IIPS and ICF 2017). The use of modern spacing method remained low and varies largely across the states and by socio-economic characteristics (IIPS and macro international 2007). Several studies have been done regarding the determinants of contraceptives use in all over the world. Most of the study shows that women education, media exposure, accessibility and source of contraception, child loss, place of residence etc are the significant predictors of contraceptive usage among currently married women (Okezie, et al. 2010; NPC & ORC macro 2004; koc 2000; okezie et al. 2010; Shreshtha 2000). Some of the study indicates that desired family size and son

I. INTRODUCTION

Women with unmet need are those who are fecund and sexually active but are not using any method of contraception, and report not wanting any more children or wanting to delay the next child. The concept of unmet need points to the gap between women's

preference are also important to understand the contraceptive usages (Ansari, 1994).

Contraceptive use helps couples and individuals to realize their basic right to decide freely and responsibly if, when, and how many children to have. Contraception use is one of the proximate determinants of fertility, and the most important predictor of fertility transition (Bongaarts, 1978). The growing use of contraceptive methods has resulted in not only improvements in health-related outcomes such as reduced maternal mortality and infant mortality, but also improvements in schooling and economic outcomes, especially for girls and women. There are two types of contraceptive methods used by the couples one is modern methods and another is the traditional method. Contraceptive prevalence is the percentage of women who are currently using, or whose sexual partner is currently using, at least one method of contraception, regardless of the method used. It is usually reported for married or in-union women aged 15 to 49 (IIPS and ORC macro, 2016).

According to the world family planning report 2017 globally modern contraceptive method is used at a larger scale. World-wide the use of modern contraceptive method was 58% among married or in union women of reproductive age group. The proportion of the demand for family planning that was satisfied by modern contraceptive method was 78% among the proportion of women currently using a modern method among all women who have a need for family planning. The use of contraceptive method was lowest in Africa 36% compared to other regions of the world and it varies from 58 per cent in Oceania to around 75 per cent in northern America and Latin America and the Caribbean countries. Understanding the determinants of contraceptives use is very critical especially in population where heterogeneous socio-cultural factors play an important role. The present study was designed to find out the magnitude of contraceptive use and identifying the different variables, which are associated with contraceptive use in urban India.

II. MATERIALS AND METHODS

The present study uses the fourth round of national family health survey conducted during 2015-2016 in the country. NFHS-4 is the largest household survey in India that collects the data from more than 6 lakhs households and 7 lakhs women aged 15-49. It provides the estimates for all 29 states, 7 union territories and 640 districts in India. Using the multistage sampling, these surveys provides high-quality data on population and health indicators in India. NFHS surveys provides reliable and comparable data on national and state estimates on fertility, maternal and child health, risky sexual behavior, tuberculosis, malaria, non-communicable diseases, domestic violence, attitudes toward people living with HIV, the quality of health,

family welfare services, and socioeconomic conditions. The present study analyses the 139,278 currently married women from urban residence. Unmet need group included all those women who are not using any method of contraception and who either do not want to have any more children or want to postpone their next birth for at least two more years. Those who want to have no more children are considered to have an unmet need for limiting births or limiters, while those who want more children but not for at least two more years are considered to have an unmet need for spacing births or spacers.

Descriptive and multivariate analysis have been used for this study. For the first objective of the current study, cross-tabulation have been carried out to study the prevalence of currently married women age 15-49 with unmet need for family planning among currently married women in India.

For the second objective, multivariate multinomial logistic regression analysis has been applied to examine the relationship between contraceptive method choice and various socioeconomic and demographic factors.

Formula applied for multinomial logistic regression is as follows:

$$\ln(p_2 / p_1) = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + \dots + b_{ix} \dots \dots \dots \text{(ii)}$$

$$\ln(p_3 / p_1) = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + \dots + b_{ix} \dots \dots \dots \text{(iii)}$$

Where, p_2/p_1 = probability of p_2 with respect to p_1 ; p_3/p_1 = probability of p_3 with respect to p_1 ; p_1 = reference category; b_0 = intercept; $b_1, b_2, b_3 \dots b_{ix}$ is the regression coefficient of $x_1, x_2, \text{ and } x_3 \dots x_i$ respectively

The explanatory variables included in the multivariate regression model are age, religion, women's education, mass media exposure, wealth index, unmet need, contraceptive use and Age at sex etc.

The Software STATA 14.0 is used for all the statistical analyses in this study.

III. RESULTS

Table1 result shows that total unmet need for family planning are 12% (i.e. 5% for spacing and 7% for limiting) among currently married women. Unmet need for family planning decrease with increase in age-group of women. Women of aged 15-19 are 21% unmet need for contraception in which 19% and 2% unmet need for spacing and for limiting respectively. Whereas women in 45-49 age- group are 4.24% lower unmet need for family planning among them 4.12% and 0.12% are unmet need for limiting and for spacing respectively. Level of education have positive association with unmet need for family planning, means increase in level of education is more unmet need. Women having higher level of

education are 15% higher unmet need for family planning (8% for spacing and 7% for limiting). While illiterate women are only 9% unmet need in which 2% and 7% unmet need for spacing and for limiting. Standard of living index (wealth index) of women characteristics are negatively associated with unmet need for family planning. Unmet need is lower 12% (5% and 7% for spacing and for limiting resp.) For women having richest standard of living index and higher 16% (6% for limiting & 10% for limiting) for women who belong to the poorer standard of living index.

In case of religion differential, Muslim women are higher 15% unmet need for family planning and lower 12% unmet need for both, for Hindu as well as for other. Prevalence of unmet need for family planning are more for those who are exposed to listening radio as

compared to not exposed to radio. Women who are exposed to radio are 6%, unmet need for spacing and 7% unmet need for limiting and those who don't are 5% unmet need for spacing & 7% unmet need for limiting. Result from the table reveal that women have the experience of 1 children born are 19% unmet need with 13% and 6% unmet need for family planning respectively, whereas lower for women having 3 children ever born. Unmet need decreased as the number of living children increased to four or five thereafter increasing again for women with more than five living children. Women having 0-1 living children are 16% higher percentage of unmet need for FP (12% for and only 4% for limiting), followed by women having 6 or more living children and lower for women with 4-5 living children.

Table1: Prevalence of currently married women age 15-49 with unmet need for family planning among currently married women in India, (NFHS-IV, 2015-2016)

Background characteristics	Unmet need for family planning			Sample size (n)
	Spacing	Limiting	Total	
Urban	4.97	7.28	12.25	
Age group				
15-19	18.97	2.17	21.14	2907
20-24	14.69	6.58	21.27	17961
25-29	8.84	9.62	18.46	28040
30-34	3.51	8.84	12.35	26199
35-39	1.05	7.36	8.41	24685
40-44	0.26	6.21	6.47	20897
45-49	0.12	4.12	4.24	18590
Education level				
No education	2.37	6.9	9.27	25911
Primary	2.77	7.36	10.13	16298
Secondary	5.34	7.41	12.75	69610
Higher	7.79	7.26	15.05	27459
Wealth index				
Poorest	5.77	10.27	16.04	3676
Poorer	4.91	8.38	13.29	8894
Middle	4.89	7.61	12.5	21141
Richer	5.09	7.21	12.3	42844
Richest	4.87	6.89	11.76	62724
Religion				
Hindu	4.82	6.77	11.59	106,547
Muslim	6.38	8.33	14.71	24,459
Other	4.98	6.68	11.66	8,271
Children ever born				
0	9.57	1.3	10.87	14472
1	12.67	6.17	18.84	31965
2	2.39	8.64	11.03	54017
3	1.23	7.81	9.04	24131
4+	0.99	9.11	10.1	14693

Note: all selected variable are significantly associated ($p < 0.05$) with outcome variable.

Table2 Multinomial logistic regression analysis has been used to show the preference of modern and traditional methods over the non-use of contraception among currently married women in India. Compared to women aged 15-19 years, all other age groups are more likely to choose modern over the non-use of contraception but women of age 20-24, 25-29 and 45-49 are less likely to choose traditional method over non-user. Compared to women with no education, all other educated women are more likely to choose modern methods and traditional methods over the non-use of contraception. Women with primary and higher educated are 13% and 32% more likely to choose modern and traditional method respectively over non-use compared to women having no education.

Result also shows that compared to poorest wealth index category, all other groups are more likely to choose modern methods and traditional methods over the non-use of contraception. Women with richest wealth category are 92% and 30% more likely to choose modern and traditional method respectively over non-use

compared to reference category. Compare to Hindu women, Muslim women are 39% and 22% are less likely to choose modern and tradition method respectively. Further, women belong to other religion are 13% more choice to modern method but 14% less choice to traditional method relative to the Hindu women. Those all women whose age at sex above 18 years old are less likely to choose modern method as compared to women who have practiced the sex below 18 years old. But women whose age at sex 25-30 and above 30 are 10% and 11% more choice for tradition method over non-user as compared to women with below 18 years age at sex. Women with 2-3 and 4-5 living children are more choice to modern method over non-user compared to the women with 0-1 living children but women with 6+ living children are 11% less choice to modern method over non-user. On the other hand, women with more than 2 or more living children are more choice to traditional method over non- use than women with 0-1 living children.

Table2: Multinomial logistic regression of determinants of contraceptive use method among currently married women in India (NFHS-IV, 2015-16)

Background	Modern vs non- user				Traditional vs non- user			
	RRR	p-value	[95% conf. Interval]		RRR	p- value	[95 conf. Interval]	
Age group								
15-19®	1							
20-24	1.07	0.285	0.944	1.216	0.72	0.001	0.591	0.868
25-29	1.44	0.000	1.272	1.636	0.96	0.671	0.793	1.161
30-34	2.05	0.000	1.803	2.325	1.29	0.01	1.063	1.566
35-39	2.35	0.000	2.071	2.674	1.58	0.000	1.304	1.926
40-44	2.26	0.000	1.984	2.567	1.10	0.337	0.903	1.347
45-49	1.71	0.000	1.500	1.943	0.57	0.000	0.463	0.701
Education								
No education®	1							
Primary	1.13	0.000	1.080	1.183	1.18	0.001	1.073	1.293
Secondary	1.05	0.007	1.014	1.093	1.26	0.000	1.170	1.364
Higher	1.07	0.008	1.018	1.123	1.32	0.000	1.201	1.455
Wealth index								
Poorest®	1							
Poorer	1.44	0.000	1.316	1.568	1.23	0.019	1.034	1.454
Middle	1.55	0.000	1.429	1.678	1.28	0.002	1.093	1.495
Richer	1.72	0.000	1.593	1.864	1.26	0.003	1.083	1.471
Richest	1.92	0.000	1.773	2.080	1.30	0.001	1.109	1.515
Religion								
Hindu®	1							
Muslim	0.61	0.000	0.592	0.633	0.78	0.000	0.736	0.836
Other	1.13	0.000	1.071	1.190	0.86	0.006	0.774	0.957
1+	0.74	0.000	0.695	0.797	1.18	0.012	1.036	1.334
Children ever born								
0®	1							
1	4.98	0.000	4.648	5.326	4.88	0.000	4.342	5.475
2	8.19	0.000	7.227	9.285	3.49	0.000	2.743	4.429

3	9.16	0.000	8.021	10.466	3.44	0.000	2.666	4.451
4+	9.92	0.000	8.309	11.832	3.37	0.000	2.394	4.740

IV. DISCUSSIONS

Unmet need is higher for limiting (7%) than for spacing (5%), with a total of 12%. According to NFHS-III, in Tamil Nadu the unmet need has been reported as 9%. Another study done in Ballabgarh, India. (Yadav, et al. 2010) showed the prevalence of unmet need for family planning as 17.5%. According to NFHS-III survey, one in five (21%) currently married women in up had an unmet need for family planning in 2005–06. (Nazir, et al. 2015) a study reports an unmet need for family planning as 7.5% (9.1% in rural area and 5.9% in urban area). Accordingly, to nfhs-3- 13% of married women have unmet need for family planning down from 20% in NFHS-1 and 16% NFHS-2. According to NFHS-2, unmet need for contraception is highest (27%) among women below age 20 years and is almost entirely for spacing the births rather than for limiting the births. It is also relatively high for women in age group 20-24 years (24%) with about 75% of the need being for spacing the births. The unmet need for contraception among women aged 30 years and above are mostly for limiting the births.

In present study, unmet need is significantly positively associated with women's level of education. Unmet need is 9% for women with no education and 15% among women in higher education. A study (Nazir, et al. 2015) higher unmet need was seen in illiterate woman as compared to educated ones both in rural and urban areas. Present study shows that unmet need decreases with increase number of living children up to 4-5 children after that start increasing. (Pal, et al. 2014) it was seen that women with a lesser number of living children had a higher unmet need than those with a greater number of living sons. Vohra, et al. (2014) the unmet need decreases with the number of children the couples have. In present study women belong to low wealth index are more exposed to unmet need for FP, particularly more women exposed for limiting of birth. A study observed by Mallick, et al. (2018) show that unmet need was higher among the women with poor socioeconomic status, which may be attributed to their poor living conditions forcing them to shift their priorities to fulfilling their basic needs of life compounded by their misconceptions about FP practices.

In present study modern, contraceptive method is more preferable over tradition method. Amongst modern method, female sterilization (36%) are most preferred followed by condom (9.04%). Present study shows that women at early age having less contraceptive use method. It's only 17% in 15-19 age-group. Condom is more preferred in this age followed by pill method. It's 6% and 4% respectively. There are lots of study have done shows that less use of contraception among early age of women. Also, Present study show that women

having more children are more exposed to use of contraception. It increases up to 3 children and then start declining, in case having more than 3 children. Devi *et al.* In a study on the unmet need in Uttar Pradesh found that contraceptive usage was much less in women with fewer living sons. It was 31% in women with two or more living sons than in women with fewer living sons (5% for no living sons). This is because of a strong preference for sons in northern India. It has been seen that those women who have already borne enough sons would like to stop childbearing and women with few sons would like to continue childbearing. Many of study in India show that early age women less use of contraception. It might be because of lack of knowledge about the family planning methods and lower decision-making power. Moreover, similar findings were cited in a study in Bangladesh that younger women are less likely to use family planning methods than older women.

In present study, there are positive association with contraceptive use. Patil, et al. (2010) there was significant association between prevalence of unmet need and age, number of living children, education. There was no significant association found between occupation, religion and unmet need for contraception. The study revealed that lack of information about contraceptive method and its sources (57.6%) were the common reasons for non-acceptance of contraception. (Kanitkar and Murthy, 1983) in their study on contraceptive use in Rajasthan and Bihar found a clear positive relationship between the standard of living and use of contraception. Kerketta, et al. (2015) the standard of living index of the household also shows a positive effect on use of contraception. Women belonging to low standard of living are 44% significantly less likely and high standard of women are 60% significantly more likely to use contraception, than women belong to medium SLI. The women with increasing parity use more contraception.

V. CONCLUSION

Findings of this study suggested that, to increase the percentage of practicing contraception among high risk mothers, health education must be emphasized extensively by healthcare personnel. In addition, one of the new approaches introduced and imparted was adopting the advancement in technology in giving health education. Thus, improved access to family planning services, better education, improved standard of living, and higher exposure to mass media can significantly decrease the unmet need of family planning. It can be concluded that health education campaigns are necessary to increase awareness and counseling of eligible couples on small family norm is essential.

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