Determinants of Contraceptive Usage in India

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Abstract

This study identifies the determinants of contraceptive usage in India based on the data from all the three consecutive rounds of National Family Health Surveys. Along with understanding the deterministic factors of contraceptive use in India, the pattern of change spread over the two recent decades in their influence on determining contraceptive usage is also highlighted in this study. Binary logistic regression was used in order to measure the likelihood of contraceptive usage by each of the independent variables. Though the level of influence of each independent variable varied across the three surveys, most of the variables considered were found to be significant. The development indicators show a major influence on the contraceptive usage throughout the period under study. More specifically, the education and occupation of not only the respondent, but also of their spouse found to be significant predictors of contraceptive usage. Also, exposure to mass media is an influencing factor for contraceptive usage. As the number of mass media to which the respondent exposed went up, the chances of adopting a contraceptive method also increased. Also, the low human development index from the states of central region confirms the role of overall development in determining contraceptive usage.

1. Introduction

The world would not have been the same as it appears today unless a massive regulation program called family planning has not advanced. And India was the first country in the world to adopt an official population policy and launch an official family planning program way back in 1952. All development programs should be periodically analyzed their goals and methods, in the light of accumulated experience and the changes of situation which normally occur over a period of time [1]. Family Planning Program is not an exception though the official program later got expanded to cover maternal and child health, family welfare and nutrition as well. Unmet need is a valuable indicator for national family planning programs because it shows how well they are achieving the key mission of meeting the population's felt need for family planning [2]. Also, it is an important measure for assessing progress toward the Family Planning 2020 goal to extend family planning services to an additional 120 million women and girls by 2020 [3, 4]. The NFHS-3 survey (2005-2006) indicated that the unmet need for FP in India was 13 percent. Furthermore, nearly 21 percent of pregnancies are either unwanted or mistimed [5]. Since the unmet need for family planning is defined as the proportion of married women of reproductive age who are not using any contraceptive method but would like to postpone the next pregnancy [6]. These figures indicate the considerable proportion of the population not using any contraceptive method. So the present study focuses on identifying the determinants of contraceptive use in India.

Globally, it is a well established fact that contraception is one of the most important proximate determinants of fertility [7, 8, 9]. Contraceptive use explains much of the recent fertility decline in India also [10, 11, 12, 13, 14]. To have a detailed understanding of the deterministic factors of contraceptive use in India and the pattern of change in their influence spread over the two recent decades, this study analyses the data from the all the

three consecutive NFHS surveys conducted in India so far starting from 1992-93. Since fertility in India is primarily marital, the aim of this paper is to identify the major factors that determine the usage of any method of contraception among married women in India.

2. Data and methods

2.1. Data. The present study used data from three consecutive surveys conducted at the national level in India. The International Institute for Population Sciences (IIPS) has conducted three rounds of National Family Health Survey (NFHS), which was a large scale household survey throughout India. NFHS-I were conducted during 1992-93 period [15], subsequently the second and third surveys were conducted during 1998-99 and 2005-06 respectively [16, 17]. From these three data sets, the currently married women aged 15-49 were selected for the present study. Contraception, defined as methods or devices used to prevent pregnancy, is categorized into two types: modern and traditional methods. This study considers both modern and traditional methods collectively as contraceptive usage. However, current use of contraception is preferred to ever-use because of its greater precession and its more direct implications for family planning programs [1]. All the data sets underwent separate, but similar treatment of analysis in accordance with the study objective.

2.2. Methods. The analysis methodology for this study was chosen with atmost care considering the objective of the study and the data under analysis. The usage or non usage of any of the contraceptive method is a dichotomous variable. However, for the purpose of explaining the effect of given set of independent variables on the dichotomous dependent variable, there are many statistical model available viz. discriminant function analysis, logit analysis and logistic regression. But when the predictor variables are a mix of continuous and categorical variables, logistic regression is often chosen [18, 19, 20]. Therefore in the present study, in order to extract the deterministic factors of contraceptive usage, the multivariate logistic regression analysis was chosen

3. Descriptive statistics of variables

Table.1 describes the trend in contraceptive usage among currently married women in the reproductive age group. Irrespective of the classification in the socio-demographic variables the contraceptive usage increased over the years. The age wise distribution shows that the contraceptive usage increase as the age increases. But after age 30 no much increase is seen in the contraceptive usage and this may be due to the adoption of permanent method in the 30s. In the religious group classification Muslim community has the lowest contraceptive usage during the NFHS-I and NFHS-II period. However, in the NFHS-III survey period the contraceptive use among Christians shows a downward trend and they have the lowest use in this period. Among the ethnic groups scheduled tribe population has the lowest use of contraception. During the 1992 -2006 period the contraceptive usage among the scheduled tribe population increased about 12 percent which is also lowest among ethnic groups as scheduled caste population increased this by 20 percentage and the others increased the use by about 15 percentage. The contraceptive usage by number of living children shows that as the number increases the use also increases. This may be attributable to the achievement of the desired family size. The exposure to mass media enhances the awareness, attitude and practice of contraceptive in any community. The women who have exposure to more than one mass media are reported the highest usage of contraceptives compared to the other two groups. Marital duration wise classification shows that during the initial years contraceptive usage is very low and increasing afterwards. After completing 8 years of marital duration about 68 percent are using any method of contraception in 2005-06. The unmet need for family planning is visible in the percentage not using any contraceptive method after achieving the desired family size. Among the women who do not want any more children only 70.97 percentages are using any method of contraception.

TABLE 1: Contraceptive usage among married females in India categorized by various socio-demographic factors for the periods 1992-93, 1998-99 and 2005-06.

Socio Demographic variables	Groups	Percentage of female using any contraceptive method		
		NFHS 1 (1992-93)	NFHS 2 (1998-99)	NFHS 3 (2005-06)
Age group	15-19	7.51	7.71	13.16
	20-24	22.26	25.40	35.15
	25-29	44.81	48.05	57.29
	30-34	59.53	63.07	70.36
	35+	58.86	64.48	69.01
Religion	Hindu	45.69	50.58	61.88
	Muslim	32.52	38.29	48.22
	Christian	40.11	44.29	43.65
	Other	52.03	57.61	61.82
Ethnicity	SC	39.59	46.17	59.71
	ST	33.35	37.40	45.31
	Others	46.68	51.79	61.36
Number of living children	0	4.84	4.59	7.77
	1	21.73	25.89	39.83
	2	50.36	58.31	71.17
	3	62.29	67.65	75.10
	4+	56.19	58.19	63.62
Mass media effect	No mass media	33.80	36.73	45.84
	One mass media	47.56	52.44	59.52
	2+ mass media	56.90	59.27	63.53
Marital duration	0-1	8.61	9.92	14.99
	2-4	18.17	23.04	33.63
	5-7	30.88	36.45	48.83
	8+	55.44	60.65	68.44
Desire for more children	Wants more	11.37	12.39	22.18
	Undecided	12.17	15.13	20.11
	Wants no more	62.90	65.60	70.97
Partners education level	No education	34.83	40.59	52.51
	Primary	46.16	50.28	59.82
	Secondary	47.11	50.53	59.58
	Higher	58.39	56.39	65.84
Partners occupation	Not Working	36.07	43.93	58.71
	Working	44.63	49.27	58.99

Socio Demographic variables	Groups	Percentage of female using any contraceptive method		
		NFHS 1 (1992-93)	NFHS 2 (1998-99)	NFHS 3 (2005-06)
Respondent occupation	Not Working	43.08	48.17	57.64
	Working	46.99	50.84	60.95
Type of place of residence	Rural	39.70	44.41	54.62
	Urban	54.55	59.62	64.48
Region	Central	34.64	39.61	55.68
	North	49.56	54.29	61.26
	North East	40.02	43.39	49.25
	East	38.85	42.65	55.65
	West	51.14	58.01	65.44
	South	53.25	58.57	67.09
Highest educational level	No education	36.91	42.82	54.57
	Primary	52.12	53.50	61.26
	Secondary	52.81	54.83	61.01
	Higher	62.77	59.16	66.24
Has electricity	No	33.50	34.81	44.85
	Yes	51.32	56.14	62.76

Analysis of the partner's education level shows that higher educated class practice comparatively higher usage of the contraceptives compared to those who are less educated. Partner's occupation which is classified as working and non-working shows considerable association with contraceptive usage with a higher percentage of contraceptive usage among working population during NFHS-I. However, in the later surveys the differences got diminished and during the NFHS-III survey period not much difference was observed. The urban areas are having more accessibility and awareness for contraceptives and may be due to the same reason the usage is more in urban areas than in rural areas. The gap between the rural and urban areas which was 15 percentage in NFHS-I is got reduced to 10 in NFHS-III. The region wise comparison shows that the highest use is seen in the south region and lowest in the North East region during NFHS-III survey period. The educational achievement of the respondents shows an impact in the use of contraceptives. This was similar to that of the educational level of respondent's spouse. The electrification of area is both an indicator of the development of that area and the socio-economic status of the household. The contraceptive usage of women residing in an electrified household is higher compared to their counterparts. Logistic regression analysis has been carried out to establish the results got in the two way analysis.

4. Results and Discussion

Multivariate logistic regression was performed separately for the three periods to assess the relative importance of the independent variables on contraceptives use. Logistic regression has been a conventional approach in studies where the dependant variable is taken as the presence or absence of something and the predictor variables are categorical. Contraceptive use is coded as 1 when respondent used any method of contraception and else is coded as 0. The effect of each of the various socio – economic – demographic factors are discussed in detail in the below sections.

TABLE 2: Contribution of selected explanatory variables to the contraceptive usage during 1992-93 to 2005-06

	1992-93			1998-99			2005-06		
	B	Sig.	Exp(B)	B	Sig.	Exp(B)	B	Sig.	Exp(B)
Respondents Age									
15-19 (rc)									
20-24	.198	.001	1.219	.291	.000	1.338	.257	.000	1.294
25-29	.469	.000	1.598	.613	.000	1.845	.573	.000	1.773
30-34	.696	.000	2.005	.933	.000	2.542	.868	.000	2.382
35+	.438	.000	1.550	.745	.000	2.107	.559	.000	1.748
Religion									
Hindu (rc)									
Muslim	-.558	.000	.572	-.610	.000	.543	-.586	.000	.557
Christian	-.540	.000	.583	-.410	.000	.664	-.752	.000	.471
Other	.122	.003	1.130	.099	.020	1.104	-.033	.431	.968
Ethnicity									
SC (rc)									
ST	.002	.954	1.002	-.143	.000	.867	-.202	.000	.817
Others	.100	.000	1.105	.075	.002	1.078	-.014	.553	.986
Number of living children									
0 (rc)									
1	1.487	.000	4.425	1.689	.000	5.414	1.854	.000	6.386
2	2.053	.000	7.789	2.435	.000	11.413	2.757	.000	15.759
3	2.430	.000	11.356	2.791	.000	16.294	3.047	.000	21.059
4+	2.209	.000	9.111	2.448	.000	11.570	2.721	.000	15.196
Mass media effect									
No mass media (rc)									
One mass media	.329	.000	1.390	.450	.000	1.568	.397	.000	1.487
2+ mass media	.446	.000	1.562	.591	.000	1.807	.521	.000	1.683
Marital duration (in years)									
0-1 (rc)									
2-4	-.361	.000	.697	-.395	.000	.674	-.290	.000	.748
5-7	-.620	.000	.538	-.633	.000	.531	-.574	.000	.563
8+	-.404	.000	.667	-.357	.000	.700	-.380	.000	.684
Desire for more children									
Wants more (rc)									
Undecided	-.359	.000	.698	-.385	.000	.680	-.584	.000	.557
Wants no more	1.813	.000	6.127	1.681	.000	5.369	1.117	.000	3.057

	1992-93			1998-99			2005-06		
	B	Sig.	Exp(B)	B	Sig.	Exp(B)	B	Sig.	Exp(B)
Partners education level									
No education (rc)									
Primary	.227	.000	1.254	.201	.000	1.223	.170	.000	1.186
Secondary	.176	.000	1.192	.111	.000	1.118	.076	.002	1.079
Higher	.216	.000	1.241	.098	.004	1.103	.138	.000	1.148
Partners occupation									
Not Working (rc)									
Working	.286	.000	1.331	.218	.000	1.244	.028	.655	1.028
Respondents Occupation Not Working (rc)									
Working	.193	.000	1.213	.187	.000	1.205	.198	.000	1.219
Place of Residence rural (rc)									
Urban	.136	.000	1.146	.169	.000	1.184	.165	.000	1.180
Region									
Central (rc)									
North	.465	.000	1.593	.507	.000	1.660	.146	.000	1.157
North East	.395	.000	1.485	.308	.000	1.361	-.049	.125	.952
East	.376	.000	1.457	.443	.000	1.557	.269	.000	1.309
West	.442	.000	1.555	.553	.000	1.739	.332	.000	1.393
South	.691	.000	1.995	.661	.000	1.937	.468	.000	1.597
Highest educational level No education (rc)									
Primary	.435	.000	1.544	.245	.000	1.277	.221	.000	1.248
Secondary	.587	.000	1.799	.382	.000	1.465	.325	.000	1.385
Higher	1.051	.000	2.861	.613	.000	1.845	.630	.000	1.878
Has electricity									
No (rc)									
Yes	.229	.000	1.258	.404	.000	1.498	.404	.000	1.497
Constant	-5.004	.000	.007	-5.346	.000	.005	-4.269	.000	.014
	R square = 0.316 -2Loglikelyhood = 79928.88 Success Rate = 75.8			R square = 0.323 -2Loglikelyhood = 82506.18 Success Rate = 76.2			R square = 0.264 -2Loglikelyhood = 83075.09 Success Rate = 74.8		

rc: reference category.

4.1. Age: Age of respondent found to be a significant predictor of the usage of contraceptive usage in India. And this is true throughout the three surveys over three different timings. Further it is noted that women in the age-group 15-19 are less likely towards the usage of contraceptive method compared to the other age groups in all the surveys. This indicates that the younger women would like to raise children at the early stage of their married life. The chances of adopting a contraceptive method by a married woman in the 30-35 age groups are double when

compared to the 15-19 age group in 1992-93 period. However this chance has increased more than double in both the surveys conducted in 1998-99 and in 2005-06. Previous studies also highlighted the non-adaptability of a contraceptive method by the adolescent married women in India. Adolescent married women in India are under more pressure to prove their fertility, thus they are less likely to use any kind of contraception [21].

4.2. Religion: Among different religious groups, the chances of adopting a contraceptive were higher among Hindus compared to the other categories in general. Reciprocating the odds observed from the result of the NFHS 2005-06, it was observed that the chance of adopting a contraceptive method among Hindus is almost two times higher than that of Christians. Also the chance of adopting a contraceptive method is 80 percent higher among Hindus when compared to that of Muslims as per the latest survey in 2005-06. This implies the situation mentioned in earlier studies still prevails. Catholism and Islam are seen to be generally pronatalist in their beliefs [22]

4.3. Ethnicity: A consistent significant relation was not observed between the ethnicity and the contraceptive usage while considering the results of the surveys in three different timings. The result from the 1992-93 and 1998-99 suggests that the chance of adopting a contraceptive method among the non-SC/ST category is slightly higher when compared to that of SC. However, during 2005-06, this got reversed by slightly by very narrow of 1 percent more chances to SC. Furthermore during 2005-06, SC category indicates more chances of practicing contraceptive methods than ST category.

4.4. Number of living children: One important explanatory variable for determining the usage of contraceptive method is the number of living children. Compared to the zero parity issueless respondents, the chances of adopting a contraceptive method by the respondent having one living child is high and this chance keeps increasing over the three different periods the surveys. For instance, in the first survey, the chances of adopting a contraceptive method by a respondent having one child is four times higher compared to zero parity respondent. However this chance got increased to five times and to six times in the second and third surveys conducted during 1998-99 and 2005-2006 respectively. This observation about higher chances of contraceptive usage compared to issueless respondents holds well for those who having one, two, three and four or more children as well. As per the odds observed for the results for the latest survey conducted on 2005-06, the chances of adopting contraceptive method by a respondent having three children is 20 times higher than that of a respondent without children.

4.5. Mass Media: Exposure to mass media turns up as an important factor to the adoption of contraceptive method. As the number of mass media to which the respondent exposed goes up, the chances of adopting a contraceptive method also increased. Based on the latest survey conducted during 2005-06, the chances of adopting a contraceptive method is 48 percent more for those who are exposed to one mass media. And the chances of adopting a contraceptive method are 68 percent more likely for those who have access to two or more mass media. This was 39 percent and 56 percent in 1992-93 and was 57 percent and 80 percent in 1998-99. Hence the same pattern was observed in all the three surveys though the relative effect varied slightly

4.6. Marital Duration: The marital duration found to be a significant predictor of contraceptive usage. By reciprocating the odds observed from the result of the NFHS 2005-06, it was observed that during their first year of wedded life couples are 33 percent more likely to use a contraceptive method when compared to those who are in the 2nd to 4th years of duration of their marriage. Also, when compared to those who are in the 5-7 years of married life, the chances of practicing contraception is 77 percent more before the first anniversary of marriage. This pattern was same during 1992-93 and 1998-99 though the magnitudes slightly varied.

4.7. Desire for more children: The desire for having more children was obviously found to be a significant predictor of the contraceptive usage. In the latest survey of this series conducted on 2005-06, the contraceptive acceptance of who don't desire to have more children is 3 times more than that of the opposite category who desire for more children. Also the pattern was same in the previous surveys, though the magnitude was different. Another interesting factor by reciprocating the odds values for the latest survey analysis is that the respondents, who clearly express the

desire for more children were, 79 percent more likely to use contraceptive than those who undecided on the desire for more children.

4.8. Partners Education Level: The educational level of the respondent's partner is also a significant predicator of the usage of contraceptive acceptance. The effect of education is consistently reflected across the three surveys. The more the partner is highly educated, the more are the chances of adopting a contraceptive method. Moreover, this is a well – known predictor of adopting contraceptive method since long time. For instance, Fisek & Sumbuloglu [23] also found that both husband's and wife's education is indicative of their contraceptive practices.

4.9. *Partner's Occupation*: It is observed from the results that the respondents who partners are currently working are more likely to adopt a contraceptive method. Though this is a true statement for the data available from the three surveys considered, the effect of partner's occupation on adopting contraceptive method is coming down over the periods. The chance of adopting a contraceptive method for respondents with employed partners are higher by 33 percent, 24 percent and 2 percent during 1992-93, 1998-99 and 2005-06 respectively.

4.10. *Respondent's Occupation*: Similar to the effects of the occupation of the partner, the occupation of the respondent is also a significant predictor of adoption of contraceptive method. In other words, the respondent who is currently working is more likely to use contraceptive method in all the three survey data. However it should be noted that unlike the effect of employment status of respondent's spouse, the magnitude of the effect of respondents' own employment status stays almost stable across the three surveys. The chance of adopting contraceptive method for an employed respondent compared to their unemployed counterparts were higher by around 21 percent in all the three surveys during 1992-93, 1998-99 and 2005-06.

4.11. Place of Residence: Respondents from urban area are more likely to adopt a contraceptive method when compared to respondents from rural area. Though the chance of adopting contraceptive is higher in urban areas throughout the three surveys, an increasing effect of urban hood is visible from 1992-93 to 2005-06. Specifically, while the chance of adopting contraceptive measures was higher in urban respondents by 14 percent during 1992-93 which increased to 18 percent in both 1998-99 and 2005-06.

4.12. Region: Region is found to be a significant predictor. As per the results from the latest survey, respondents from north, east, west, and south are more likely towards adoption of a contraceptive method by keeping only the respondents from north eastern region as an exception. In other words, as per the latest survey data in 2005-06, respondents from all regions except from north- east are more likely to adopt contraceptive method when compared to that of central region. If we examine the results for 1992-93 and 1998-99, respondents from all regions including north-east was having a higher chance of adopting one or the other contraceptive method when compared to the central states. In other words, respondents from central states were the most unlikely to the practice of contraception in 1992-93 and 1998-99, whereas it the respondents from north-east as per the latest survey of 2005-06 who is most unlikely to contraceptive usage.

4.13. *Respondent's Education*: As per the latest survey in 2005-2006, respondents with higher education are 87 percent more likely to adopt a contraceptive method compared to uneducated. This pattern was same in the previous surveys during 1992-1993 and 1998-1999. During 1998-99, the chance of adopting contraceptive method by respondents with primary, secondary and higher education was higher by 54 percent 79 percent and 86 percent respectively compared to the uneducated. However during 2005-06, this has shifted to 24 percent 38 percent and 87 percent for respondents with primary, secondary and higher education respectively compared to the uneducated.

4.14. Availability of Electricity: Availability of electricity was treated as in indicator of socio-economic status. It was observed that respondents with higher socio-economic status are more likely to adopt contraceptive method. This is true in the case of all the three surveys during 1992-93, 1992-93 and 20005-06. However, among the

respondents with higher socio-economic status, the chance of adopting contraceptive was higher by 25 percent, 49 percent and 49 percent during 1992-93, 1998-99 and 2005-06 respectively.

5. Conclusion

The deterministic factors affecting contraceptive usage was analyzed using the data from National Family Health Surveys during 1992-93, 1998-99 and 2005-06. Though the level of influence of some predictor variables varied across the three surveys, almost all the factors considered were found to be significant predictors of contraceptive usage in India. Age and found to be significant predictor of contraceptive usage consistently across the periods keeping 30-34 age group with highest chance of adopting a contraceptive method compared to 15- 19. Though the significant effect of religious and ethnicity factors were slightly inconsistent across the three surveys, Hindus found to be more adaptable towards contraceptive usage as per the latest survey and in general. The number of living children was a factor consistently appeared as significant throughout the surveys with a pattern of more number of living children implying more chance of adopting contraceptive method. The desire for more children appeared as a major factor in predicting the contraceptive usage throughout the survey periods, though the effect was not consistent across the three periods under study. Also, Respondents from urban area are more likely to adopt a contraceptive method when compared to respondents from rural area throughout the three surveys analyzed.

Availability of electricity was included in the analysis as a direct indicator of development though there were factors like education and occupation which could also indicate the overall development of the community. The availability of electricity as a development indicator turned up as a significant predictor of contraceptive usage almost consistently throughout the periods. Educational attainment was emerged as a significant predictor in the three surveys. Furthermore, educational attainment of the spouse was another significant predictor of contraceptive usage. The more the educational attainment, the chances of adopting a contraceptive method was more. Each category of education viz. primary, secondary and higher education was also having clear positive impact on the contraceptive adaptability. Another significant factor in determining contraceptive usage was the occupational status of both the respondent as well as spouse. The chances of adopting contraceptive method were higher among the employed respondent as well as for a respondent with an employed spouse. The single most point emerging from the discussion is the effect of development indicators on the contraceptive usage whether it is education, occupation or any other means. In addition to this, the result of region as a factor further supports this observation. A close look at the impact of region on the logistic model confirm that that states from the central region comprising Uttar Pradesh and Madhya Pradesh is very unlikely to adopt contraceptive method when compared to that of all other regions consistently during 1992-93 and 1998-99. This is true in 2005-06 also with an exception that the chance of adopting contraception was slightly lesser for North Eastern region as well than that of central region states. Among the Indian states, Uttar Pradesh and Madhya Pradesh are the central region states with the lowest Human Development Indexes in 1999-2000 (0.316 & 0.285 respectively for Uttar Pradesh and Madhya Pradesh) and in 2007-2008 (0.380 & 0.375 respectively for Uttar Pradesh and Madhya Pradesh) [24]. Hence summarizing all the findings in a in a nutshell, overall development should be treated as the key target factor to be accomplished to influence the adoption of contraceptive usage. And hence, reiteration of the slogan – 'Development is the best contraceptive' – rose at the 1974 United Nations population conference in Bucharest [25] is still valid and applicable in the contraceptive adaptability of Indian population.

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