The Significant Roles of Contraceptive Use in Reducing Fertility, Infant and Child Mortality in India

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Abstract. *Contraception is an integral dimension of women's health both of them are components of the broader objectives of family planning and life long well-being i.e., controlling ones life pattern. Research data indicates a decline in fertility rates, infant mortality and child mortality rates with women's development and economic advancement, women's acknowledge the need for contraception and limiting the number of pregnancies. This study used the Indian National Family Health Survey (NFHS-2, 1998-99), 2000, for currently married women aged 15-49 years. The objective of the study is to explore the substantial impact of the use modern contraceptive methods on fertility, infant and child mortality rates in India. The knowledge of modern contraceptive methods is nearly uniform (99%) among the currently married women irrespective of their socioeconomic and geographical affiliation. The practice of contraception does not only reduce the fertility, infant, and child mortality rates, but also has major impact on the quality of their lives and reproductive health status. The strong, consistent, and negative significant effect of family planning methods have been observed on aggregate decline of fertility, infant, and child mortality. The socioeconomic background of women (education, religion, and standard of living) influenced the practice of family planning methods significantly. The use of family planning methods subsequently help to bring down the fertility, infant, and child mortality rates.*

Keywords: contraceptive methods, fertility, family planning, mortality, India

1. INTRODUCTION

The concept of family planning is an integral part of individual and couples behaviour and the diversity of their behaviour is reflected in the wide range of contraceptive methods that are being used. Over 600 million married women around the world were using contraception and nearly 500 million were living in developing countries (Population Reports, 2003). Four modern contraceptive methods – female sterilization, oral contraceptive, injectable, and IUDs were the most widely used methods among married women in the developing countries (Population Reports, 2003). Fathalla (1989) discussed in detail that reproductive health right to fertility regulation and control can not be implemented without the availability of effective, safe and acceptable contraceptive methods. The availability of effective and acceptable contraceptive choice enables women to nullify their reproductive behavior and avoid pregnancy. The practice of contraceptive can reduce the over burdened and over stretched maternal and child health care services in developing countries through reduction of the total number of pregnancies. Along with contraceptive, several factors influence fertility level directly (Bongaarts, 1982). In addition, future fertility levels are likely to depend increasingly on changes in proximate determinants contraceptive use, age at marriage, social, economic, and cultural factors that lead people in developing countries to desire fewer children (Bongaarts, 2002). Several other researchers provided the evidence of the effect of prevalence of contraceptive methods on fertility and child mortality (Rehman, 1998; Kirk and Bernard, 1998; Eimi, 1992; Chowdhury, Khan and Chen, 1976; Rajaretnam and Deshpande, 1994; Capo-Chichi and Luarez, 2001).

During the 1990s an average of 11 million children under age five died each year in developing countries, down from 20 million annually four decades earlier (Population Reports, 2003). Preston, Heuveline and Guillot (2001) reported in their study that in developing countries which has higher mortality levels, particularly among children, can push replacement-level higher to as high as a total fertility rate of 3.5 or 4.0. Micro level studies have documented that the mother's economic and educational status has impact on child survival and differential use of health care services by women in India (Khan, 1992; Stephenson and Tsui, 2002; Rani and Bano, 2003 and Salam and Siddiqui, 2006). Education affects fertility through number of interrelated factors, including women's social and economic status, access to family planning information and services, and use of contraception (Kirk and Pillet, 1998). Some researchers pointed out that the continuity of strong cultural preference for large families and large rural populations relying on

subsistence farming leads to low levels of economic development (Caldwell, 2002; Cohen, 1998; Gould and Brown, 1996 ; Kirk and Pillet, 1998).

India is the first country among the developing countries that launched the National Family Planning Programmes since 1952, with the objective of reducing the birth rate and controlling the population with the requirement of the national economy and improving women's health status. Since then, the birth rate, infant and child mortality and fertility rates have declined sharply, though the population increased more than three times. Fertility levels closely correspond to levels of contraceptive use. In states where utilization of contraceptive use is widely spread, fertility, infant and child mortality is low, and in states where contraceptive use is uncommon, fertility, infant and child mortality is high.

The 2000 New National Population Policy adopted by the Government of India has set its immediate objective that is the task of addressing unmet need for contraception in order to achieve the medium-term objective of bringing the total fertility down to replacement level by the year 2010 (Ministry of Health of Family Welfare, 2000). The prevalence of contraceptive methods have increased almost five times in the last two decades. The most important achievement of the Family Welfare Programme is that, it has created the atmosphere and made the mind of the community to accept and practice the family planning methods. This message has well reached the general population irrespective of their economic, cultural, religious affiliation, and place of residence. The utilization of existing family planning services in India depends on several interrelated factors. Women folks have low decision making power in the family, especially in the early period of marriage, and also have poor health, high pregnancy wastages, and social pressure against contraception before completion of the desired family size. Changes in desired family size can indicate how social norms about fertility are changing (Bankole and Westoff, 1998).

The aim of this study is to highlight the importance of contraceptive practice in over all development of women, and particularly in declining fertility, infant, and child mortality at national and state levels. Child-survival programmes might usefully focus on specific group of children with particularly high infant and child mortality rates, such as children who live in rural areas, children whose mothers are illiterate and children from house holds. Efforts to encourage the trend towards lower fertility might usefully focus on groups within the population that have higher fertility than average.

2. RESEARCH METHODS

In this study, the information on fertility, infant, and child mortality, knowledge and practice of modern contraceptive methods, and socio-economic background of the respondents was obtained from the National Family Health Survey-2 (NFHS-2, 2000). The NFHS-2 is one of the most complete survey of its kind ever conducted in India. The survey covered 24 states, which comprise almost 90 percent of the total population. The trends of fertility, infant, and child mortality rates and knowledge and prevalence of contraceptive methods were examined in the selected fifteen major states. All 89,777 of the respondents were ever married women aged 15-49, and 91,196 households were covered in the NFHS-2 survey. Only currently married women (not included divorced, widows, separate and above 50 years of age) and their background such as maternal education, residence, religion. economic status, and contraceptive behavior were considered. The X^2 test, Pearson moment correlation coefficient, and 't' ratio for testing the significance of a coefficient correlation were applied.

3. RESULTS

3.1. Knowledge and Contraceptive Use

Table 1 presents the extent of knowledge and practice of contraceptive methods was obtained by spontaneous response among the currently married women in fifteen major states in India. It reveals that the knowledge of family planning methods was nearly uniform among the states (99.7 to 100 percent). Almost 99 percent of currently married women knew at least one or another contraceptive method in India. The results show that there was significant gap in knowledge and practice of contraceptives across India. Overall, a difference of 51 percent was estimated in proportion of knowledge of any method and the practice (use) of any method at national level. In particular, the gap in knowledge level and practice of contraceptive method was wider in states of Northern and Eastern part of India than in the Western and Southern regions. The contraceptive use in way below the national average in two most populous states of Uttar Pradesh and Bihar. In fact the knowledge of any method was more than three times likely than women practicing contraceptives methods in these two states. Currently married women from Punjab and West Bengal were leading among the states where the contraceptive prevalence rate 66.7 and 66.6 percent respectively, followed

by Kerala (63.7%), Haryana (62.4%), and Maharastra (60.9%). It was almost more than two times likely than those in Uttar Pradesh and Bihar.

Table 1
PERCENTAGE OF CURRENTLY MARRIED WOMEN AGED 15-49 YEARS WHO HAD KNOWLEDGE AND PRACTICE OF CONTRACEPTIVE METHODS IN FIFTEEN MAJOR STATES, INDIA, NFHS-2, 1998-1999

States	Knowledge			Practice			Not using any method
	Any method	Any modern method	Any traditional method	Any method	Any modern method	Any traditional method	
ndia	99.0	98.9	48.9	48.2	42.8	5.0	51.8
laryana	99.9	99.8	73.1	62.4	53.4	8.9	37.6
unjab	100.0	100.0	78.3	66.7	60.8	12.4	33.3
ajasthan	98.8	98.7	32.2	40.3	38.1	1.9	59.7
Madhya Pradesh	97.8	97.8	31.1	44.3	42.6	1.4	55.7
Jttar Pradesh	98.4	98.3	60.3	28.1	22.0	5.7	71.9
Bihar	99.2	99.2	39.5	24.5	22.4	1.6	75.5
Orissa	98.6	98.3	52.0	46.8	40.3	5.6	53.2
West Bengal	99.6	99.4	74.7	66.6	47.3	18.5	33.4
Assam	98.4	98.3	65.8	43.3	26.8	15.8	56.7
Gujarat	99.7	98.3	56.8	59.0	53.3	5.6	41.0
Maharashtra	99.4	99.4	34.5	60.9	59.9	1.0	39.1
Andhra Pradesh	98.9	98.9	15.3	59.6	58.9	0.5	40.4
Karnataka	99.4	99.3	41.9	58.3	56.5	1.7	41.7
Kerala	99.7	99.7	78.1	63.7	56.1	7.6	36.3
Tamil Nadu	99.9	99.9	51.3	52.1	50.3	1.8	47.9

Note: There are 28 states in India but we have selected large states in terms of population.

3.2 Mortality and Contraceptive Practice by Socioeconomic Background Characteristics in 15 States of India

Seventy three percent of the population of India live in rural areas (NFHS-2, 2000). Currently married women who practiced modern family planning methods still remained low in rural communities compared to their counterparts in urban settings (Table 2). Urban women usually have easier accessibility and modern family planning methods and medical facilities are more available than those in rural communities {$P(X^2_2 \leq 0.95) < 0.05$}. Therefore place of residence influences the practice of contraceptive and subsequently it would bring down infant and child mortality {P

($X^2_1 \leq 0.046$) <0.001}. The prevalence of contraceptive use among women was highest among the better educated. The rise in prevalence of family planning methods over time is statistically significant in all educational groups {$P(X^2_6 \leq 0.88)$ <0.005}. Decline in fertility, infant, and child mortality is associated with the increase of use of family planning methods and the standard of education of the respondents {$P(X^2_3 \geq 0.86)$ >0.025}. The religious affiliation had moderate influence on practice of contraceptive methods {$P(X^2_6 \leq 2.41)$ <0.05}. Moslem respondents (37.3%) had lower practice of family planning methods than the women from Hindu (49.2%), Sikh (65.2%) and Christian (52.2%). Further analysis indicated an interesting findings that the infant mortality rate were highest among the Hindus followed by among the Muslims (58.8%), Sikhs (53.3%), and Christian (49.2%). The practice modern contraceptive methods was reported to be higher among the women belong to the high and medium standard of living index than among the women belong to low standard of living {$P(X^2_4 \leq 0.41)$ <0.025}. The probability of survival of a child belonging to the family of high standard of living index was two times higher than those with low standard of living index {$P(X^2_2 \leq 0.07)$ <0.025}.

Table 2
PRACTICE OF CONTRACEPTIVE METHODS, INFANT AND CHILD MORTALITY, FERTILITY ACCORDING SELECTED BACKGROUND CHARACTERISTICS

Background Characteristics	IMR	U5MR	X^2	Any Method	Any Modern Method	Any Traditional Method	X^2	%	n
Residence									
Urban	49.2	65.4	X^2_1=0.046	58.2	51.2	6.7	X^2_2=0.95	27	21,888
Rural	79.7	111.5	(P<0.001)	44.7	39.9	4.4	(P<0.05)	73	61,761
Education									
Illiterate	86.5	122.8		42.9	39.2	3.3		36.9	48,018
Lit,<Middle School Comp.	58.5	75.8	X^2_3=0.86	55.5	49.7	5.4	X^2_6=0.88	35.7	16,257
Middle School Complete	48.1	58.1	(P>0.025)	57.2	44.6	7.4	(P<0.005)	10.6	7,073
High School or higher	32.8	37.1		57.0	47.1	9.6		16.8	12,291
Religion									
Hindu	77.1	107.0		49.2	44.3	4.7		81.9	89,443
Moslem	58.8	82.7	X^2_3=0.41	37.0	30.2	6.4	X^2_6=2.41	11.7	10,447
Sikh	53.3	64.9	(P<0.05)	65.2	54.7	10.1	(P<0.05)	1.7	1,365
Christian	49.2	68.0		52.2	54.7	7.1		3.0	2,072
Standard of Living Index									
Low	88.8	130.0		39.5	35.5	3.6		32.6	26,505
Medium	70.3	94.8	X^2_3=0.67	48.4	43.3	4.8	X^2_4=0.41	46.4	38,999
High	42.7	51.1	(P<0.025)	61.2	53.1	7.8	(P>0.025)	21.0	17,173
India(in all states)	73.0	101.4		48.2	42.8	5.0			

Note: Degree of freedom of X^2 is calculated: (r-1)x(c-1)=d.f.

3.3 Fertility Differentials and Contraceptive Prevalence

According to the findings of the 2000 NFHS-2, the total fertility rate (TFR) in India (in all states) stood at 2.85 per woman of reproductive age. The contraceptive prevalence rate (CPR) among currently married women was 48.2 percent. It observed in last decades that fertility level declined substantially. Meanwhile the prevalence of contraceptive methods considerably increased at national level. But still, there is a wide variation in fertility levels and prevalence of family planning methods among the states (Table-3). The TFR was considerable below the national average in south and western parts of India. The findings reveal that the states experiencing the steady decline of fertility had higher prevalence of contraceptive methods than states experiencing high fertility rates and having lower prevalence of family planning methods. Kerala, one of the state, almost achieved below the replacement level of TFR. This achievement might be due to the high contraceptive prevalence rate as well as the intervention of social and health care services.

Table 3
CONTRACEPTIVE PRACTICE, FERTILITY, INFANT AND CHILD MORTALITY DIFFERENTIALS IN FIFTEEN MAJOR STATES, INDIA.

States	Total Fertility Rate	Infant Mortality Rate	Under 5 Mortality Rate	Any Method	Any Modern Method	Any Traditional Method	Not Using Any Methods
India	2.85	67.6	94.9	48.2	42.8	5.0	51.8
Haryana	2.88	56.8	76.8	62.4	53.4	8.9	37.6
Punjab	2.21	57.1	72.1	66.7	60.8	12.4	33.3
Rajasthan	3.78	80.4	114.9	40.3	38.1	1.9	59.7
Madhya Pradesh	3.31	86.1	137.6	44.3	42.6	1.4	55.7
Uttar Pradesh	3.99	86.7	122.5	28.1	22.0	5.7	71.9
Bihar	3.49	72.9	105.1	24.5	22.4	1.6	75.5
Orissa	2.46	81.0	104.4	46.8	40.3	5.6	53.2
West Bengal	2.29	48.7	67.6	66.6	47.3	18.5	33.4
Assam	2.31	69.5	89.5	43.3	26.8	15.8	56.7
Gujarat	2.72	62.4	85.1	59.0	53.3	5.6	41.0
Maharashtra	2.52	43.7	58.1	60.9	59.9	1.0	39.1
Andhra Pradesh	2.25	65.8	85.5	59.6	58.9	0.5	40.4
Karnataka	2.13	51.5	69.8	58.3	56.5	1.7	41.7
Kerala	1.96	16.3	18.8	63.7	56.1	7.6	36.3
Tamil Nadu	2.19	48.2	63.3	52.1	50.3	1.8	47.9

3.4 Prevalence of Contraceptive and Infant and Child Mortality

Table 3 also presents the infant and child mortality (and prevalence of contraceptive methods) at national level in 15 major states. It shows that the infant and child mortality has considerably been declining in the last decades and the use of family planning methods substantially increased at national level. The regional variation exists in infant and child death and prevalence of family planning methods. Data show that IMR varied from 16.3 in Kerala (the lowest) to 86.7 in Uttar Pradesh (the highest). The highest infant deaths reported from five northern states namely Rajasthan (80.4), Madhya Pradesh (86.1), Uttar Pradesh (86.7), Bihar (72.9) and Orisa (81.0), where the use of family planning methods was at a low level Rajasthan (40.3%), Madhya Pradesh (44.3%), Uttar Pradesh (28.1%), Bihar (29.5%), and Orisa (46.5%).

3.5. Inter-correlation Coefficients

Correlation coefficients suggest that with the decline of fertility, subsequently the infant and child mortality decreases, and both the variables have a significant and positive correlation ($r= 0.73$; $t= 3.87$, $P<0.01$; $r= 0.98$; $t= 5.18$, $P<0.001$) (see Table 4). Utilization of the modern family planning methods directly influenced fertility. Fertility had significant and inverse association with the prevalence of modern contraceptive methods ($r= -0.77$; $t= 4.33$, $P<0.02$). The relationship between the total fertility rate (TFR) and contraceptive prevalence rate (CPR) is displayed graphically in Figure 1. The scatter plot shows that as CPR increases the TFR tends to decrease. The findings of inter-correlation indicates that with the increase in use of family planning methods, the substantial and significant decline have been noticed in child and infant mortality rates ($r= -0.70$; $t= 3.54$, $P<0.01$; $r= -0.72$; $t= 2.99$, $P<0.01$). The scatter graphs (Figure 2 and Figure 3) shows that as CPR increases the IMR and U5MR tends to decreases.

Table 4
PEARSON PRODUCT MOMENT CORRELATION COEFFICIENT AMONG THE CPR, TFR, IMR AND U4MR

	Total Fertility Rate (TFR)	Infant Mortality Rate (IMR)	Under 5 Mortality Rate (U5MR)	Any method	Any modern method	Any traditional method	Not using any methods
TFR	1						
IMR	0.73 (P<0.01)	1					
U5MR	0.79 (P<0.001)	0.98 (P<0.001)	1				
Any method	-0.77 (P<0.02)	-0.70 (P<0.01)	-0.72 (P<0.01)	1			
Any modern method	-0.67 (P<0.01)	-0.64 (P<0.02)	-0.64 (p<0.05)	0.91 (P<0.001)	1		
Any traditional method	-0.33 (P<0.30)	-0.19 (P>0.40)	-.23 (P<0.30)	0.28 (P<0.30)	-0.11 (P>0.40)	1	
Not using any method	0.77 (p<0.02)	0.70 (P<0.001)	0.72 (P<0.01)	-0.99 (P<0.001)	-0.93 (P<0.001)	0.23 (P<0.30)	1

Figure 1
RELATIONSHIP BETWEEN TFR AND CONTRACEPTIVE PREVALENCE RATE (CPR) IN 15 STATES OF INDIA, NFHS-2, 1998-1999

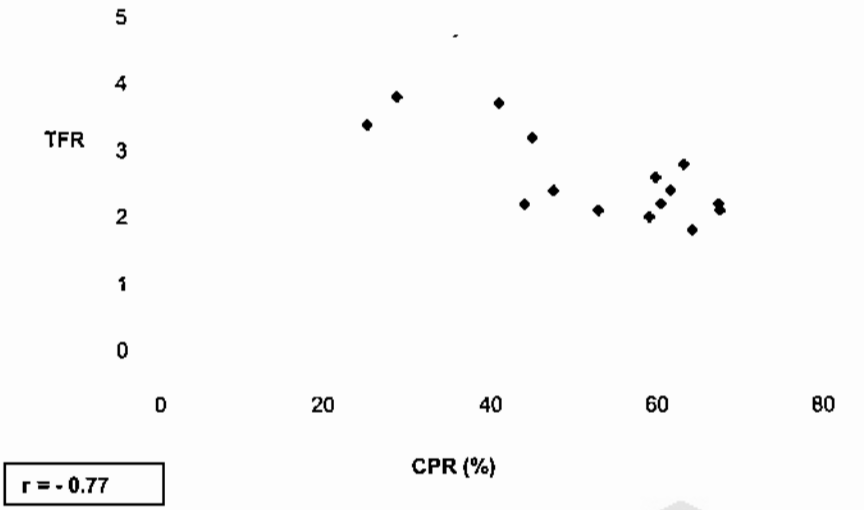


Figure 2
INFANT MORTALITY RATE (IMR) AND CONTRACEPTIVE PREVALENCE RATE (CPR) IN 15 STATES OF INDIA, NFHS-2, 1998-1999

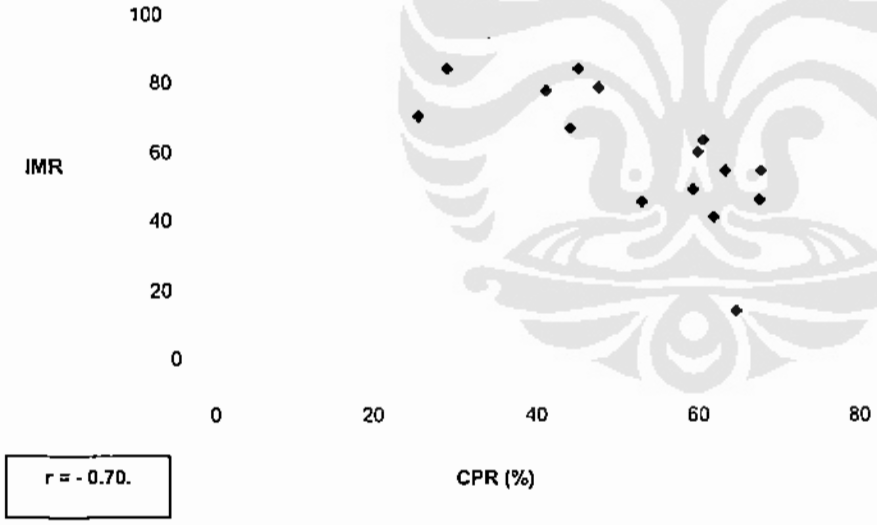
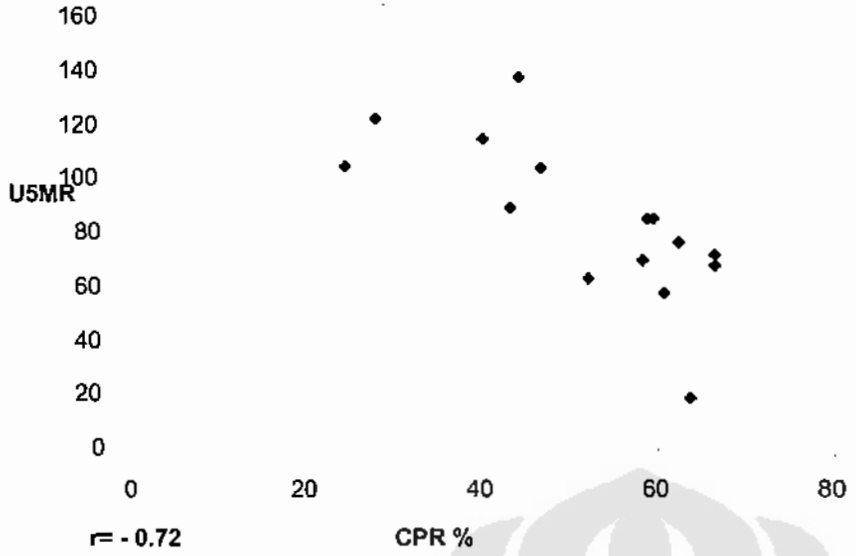


Figure 3
UNDER 5 MORTALITY (U5MR) AND CONTRACEPTIVE PREVALENCE RATE IN 15 STATES OF INDIA, NFHS-2, 1998-1999



4. DISCUSSION AND CONCLUSION

Overall, the relationships between prevalence in modern contraceptive methods on fertility, infant, and child mortality were observed in this study at national and state level. The wide regional variation was found in practice of modern family planning methods, fertility, infant and child mortality rates. Most of the northern states had low level utilization of contraceptive methods and experienced high fertility, infant and child mortality rates. The study results indicated that the states experiencing high prevalence of contraceptive methods had the sharp decline in fertility, infant, and child mortality rates. In societies which has experienced high infant and child mortality, couples attempt to have more than the numbers of surviving children in order to compensate for the likelihood that some of their children will die. High rates of infant and child mortality have contributed to high fertility levels, because many couples may have extra children to make up for those die young (Caldwell, 2002; Cohen, 1998). The modern family planning

methods play a major role to further decline of infant and child deaths at national and states level. Extra efforts have to be made to convince and to motivate currently married women to accept and practice the modern contraceptive methods in states where IMR is high and also in states where IMR have shown substantial declined. The improvement in child survival, therefore, will increase the acceptance of family planning methods.

The results reveal the wide gap between the knowledge and practice of contraceptive methods among the currently married women. Almost 99 percent of currently married women had the knowledge of one or another modern contraceptive method. Due to family and social pressure, they were unable to translate the knowledge of family planning methods into practice in the beginning of their marriage life. They are in a hurry to get pregnant and bore a child as soon as possible to establish their identity and willing to raise social status in the family and society. In South Asia and sub-Saharan countries, young married women often face cultural expectations and social pressure to prove their child bearing abilities to their families and their husbands families immediately (Mensch, Bruce, Green, 1998; Pachauri, 1996). If the newly bride does not conceived within one or two years of her marriage life, the neighbors and relatives become curious and put a question mark on the fertility status of the woman. Her status within the family and in the society after the first year of her marriage depends on her reproductive behavior for one and on her capacity to produce a male child for another. If the marriage is barren, the wife is blamed for, even by those who are fully aware of the fact that fertility of either partner is the same. Therefore, they have little option to avoid pregnancy and practice the modern contraceptive at this crucial age of their marriage life.

The practice of family planning methods and the socioeconomic background, like educational status, place of residence, religion, and standard of living revealed significant difference. Differences in contraceptive use are primarily responsible for the differences in fertility among various groups of women – whether grouped by age education, or residence (Population Report, 2003). Women's education is closely related to contraceptive use. In general, women's level of education tends to affect fertility levels at all ages (UN, 1995). Even after taking account for other factors, researchers consistently find that better educated women are more likely to use contraception (Edwards, 1996). Along with women's education, the most consistent fertility differences between group reflect where they live - whether in urban or rural areas (Cohen,1998; Muhuri, Blanc, and Rutstein,1994) and perhaps the most consistent difference in levels of contraceptive use among groups is between rural and urban women (Moreno, 1993). The study findings indicate that the

socioeconomic status of the women has a consistent and significant impact to bring down the fertility, infant and child mortality.

In the Indian context, economic progress and better health care, or access to health care, have produced some remarkable shifts. In 1951, the average life expectancy was a whole full 36.7 years. It is now close to 67 years and is projected to reach 75 years by the next decade. There has been a dramatic drop in both the TFR and IMR which are indicators to measure the health status of a society. For further reduction of infant and child mortality and fertility, the family planning program has to be integrated with mother and child health care services and to ensure the success of family planning program at national level and in those regions where child mortality and fertility are high.

The findings also emphasized that family planning service providers should target the families and those states experiencing the high infant and child mortality and fertility. The providers should also encourage, motivate, and provide the correct information how to use the contraceptive methods. When child death rates are high, many parents compensate for the anticipate loss of one or more children by giving birth to more children than they actually desire. In the families where a child die, immediately the mother of that child is motivated and encouraged in a proper manner, and the most effective family planning method should be supplied after the child death, because she is at a high risk of conception. She is also at high risk of family and social pressure to conceive as soon as possible and deliver a child to replaced the lost one. The families where the preference of sex composition is fulfilled, they are less likely to desire more children even though after losing the last child. These parents may be easily approached, motivated and convinced to accept and practice the temporary or permanent contraceptive methods. The existing health care delivery system and family planning programmes should reach the general population, particularly those living in the rural areas and high risk mothers. The health care professionals sincerely and honestly should take care of the pregnant mothers and child during the delivery and post delivery.

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