

# Awareness and utilization of Maternal health programs among mothers in a rural area

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## ARTICLE CYCLE

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## ABSTRACT

**Background:** In India MMR is 97 and in Uttar Pradesh is 167 per 1,00,000 live births. The JSY and JSSK are initiatives to reduce maternal and infant mortality. PMMVY provides cash assistance to mothers and ICDS addresses malnutrition in mothers. **Objective:** To study awareness and utilization of maternal and child health programs and its association by post-mothers. **Methods:** An observation cross-sectional study in the rural area of Saharanpur using multistage random sampling among 250 mothers. Data collected using predesigned, pre-tested and semi-structured questionnaire. Analysis was done in EPI.info 7.2.5, statistical method for analysis used was frequency, percentage for descriptive statistics and for association chi-square test was used. **Results:** Among 250 mother's, level of awareness was highest in NIS (96.4%) and lowest in PMMVY (69.2%). Utilization of ICDS, PMSMA, JSY, JSSK and PMMVY was 84.0%, 92.8%, 81.2%, 53.2% and 47.6% respectively. Association of JSY, JSSK and PMMVY with mode of delivery was found to be significant. Association of IFA tablets consumption and frequency of receiving THR was statistically significant. **Conclusions:** Awareness and utilization of maternal programs was high. Utilization of JSY, JSSK and PMMVY services were associated with higher chances of normal delivery.

## KEYWORDS

Maternal Health Programs; JSY; JSSK; PMMVY; IFA Tablets.

## INTRODUCTION

Maternal health refers to "A woman's health and well-being before, during, and after pregnancy and encompasses aspects of physical, mental, emotional, and social health." (1) Global MMR in 2020 was estimated at 223 maternal deaths per 1,00,000 live births. (2) In India MMR is 97 per 1,00,000 live births while in Uttar Pradesh MMR is 167 per 1,00,000 live births. (3) By 2030, National goal is to achieve 70 maternal deaths for every 100,000 live births. (4) Janani Suraksha Yojana (JSY) and Janani Shishu Suraksha Karyakram (JSSK) offers cash assistance for institutional delivery and free Caesarean section. Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) detects high-risk

pregnancy. Anaemia Mukht Bharat focuses on reducing anaemia. Integrated Child Development Service (ICDS) address malnutrition by providing Take Home Ration (THR). PMMVY provides cash incentives and National Immunization Schedule (NIS) provides vaccination. Saharanpur's MMR is 258 per 1,00,000 live births, which is far higher which emphasizes the need of the study. (5)

**Aim:** To study awareness of post-natal females regarding various maternal and child health programs.

**Objectives:**

- To find out utilization of maternal health programmes by post-natal females during their pregnancy.

- To study association of maternal and child health programs utilization by mother and child.

## MATERIAL & METHODS

**Study type & study design:** An observation cross-sectional study.

**Study setting:** Study was conducted in the rural area of Saharanpur.

**Study population:** The study includes all mothers who delivered and had a live child in the past 3 months at the time of data collection and mothers who will deliver during the study period both were included in study.

**Study duration:** From August 2023 to December 2024

**Sample size calculation:** The sample size was estimated based on the proportion of institutional deliveries (82.9%)(6) as reported in NFHS-5 for Uttar Pradesh. Institutional delivery is considered a critical and comprehensive indicator of maternal health service utilization. Institutional delivery reflects a culmination of awareness, utilization of maternal health programs and contact with the healthcare system. Hence, it was deemed an appropriate and statistically robust choice for determining the sample size in this study.

The sample size was calculated by using  $n = z^2 (p q)/d^2$ .

Where,

$z$  = relative deviate (at 95% confidence interval) i.e., 1.96

$p$  = % of institutional delivery = 82.9%.

$q$  =  $100 - p = 100 - 82.9 = 17.1$

$d$  = absolute acceptable margin of error 5%.

with 15% non-responsive rate. The minimum sample size was obtained 250.83 and rounded off to 250.

**Inclusion criteria:** Mothers who have lived in Sarsawa for six months or above. Both married and widowed postnatal mothers, Participants aged 18 years and above were included in the study.

**Exclusion criteria:** Pregnant women who died during delivery, didn't deliver a live baby, mothers who did not give consent or mothers who are unwilling to participate were excluded from the study.

**Strategy for data collection:** Multistage random sampling was done, out of 11 blocks of district Saharanpur one block Sarsawa was selected randomly as study area. The study area consisted of two CHCs (Sarsawa and Chilkana), out of which one

CHC was randomly selected i.e., CHC Sarsawa. The selected CHC consisted of three PHCs and 28 sub-centers out of which ten sub-centers were selected randomly. As per inclusion criteria, from each subcenter, a list of mothers with a live child from the past 3 months was obtained from the register, and an equal number i.e. 25 mothers, were selected from each subcentre randomly.

Data was collected by interview using a pre-designed and pre-tested, semi-structured questionnaire containing questions on socio-demographic information, awareness and utilization of maternal programs. The questionnaire was translated into the local language- Hindi and interview was done by community medicine resident in local language i.e. hindi. After obtaining the list of participants the interview was done at subcentre.

**Ethical issues & informed consent:** Permission was obtained from the institutional ethics committee SMMH Govt. Medical college, Saharanpur, Uttar Pradesh Verbal informed consent was taken from all participants.

**Data analysis – software:** Data was collected and organized precisely by keeping in mind safety of the data, missing items and complete information. Checking and rechecking of data was carried out and the unmatched record was re- entered. EPI.info 7.2.5 was used to analyse the data by using appropriate statistical tools (descriptive and inferential statistics were used to analyse the data). Frequency, percentage were calculated as descriptive statistics. As Hypothesis testing tools Chi-square test was used.

## RESULTS

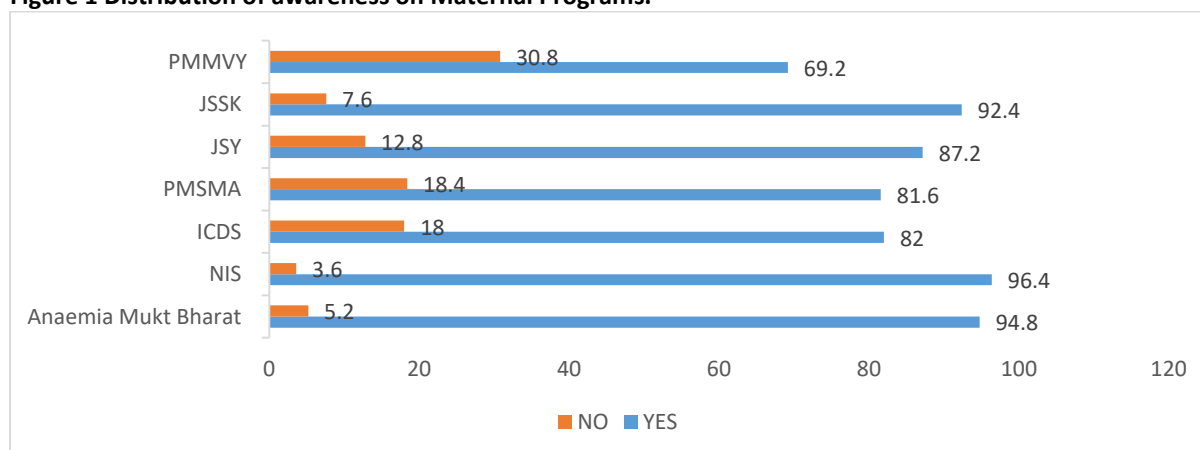
Table 1 shows among 250 mothers, 84.0 % were 21-35 years of age, age  $\leq 20$  and older  $\geq 36$  age group were 13.2% and 2.8% respectively. In mothers' education 38.4% were educated up to primary and 18.8% of them were illiterate. Among the husbands of the participating mothers, 36.0% had a secondary education, followed by primary and Higher secondary education with 26.4% and 18.4%, respectively. Occupation of the mothers shows majority (72.0%) of participants were housewives and 11.6% consist of daily-wage workers. Among the participants, the largest group (40.8%) is made up of the lower middle class, followed by the middle class (35.6%), and 10% of participants are from the lower class.

**Table 1 Socio – Demography of the participants (n=250).**

Variable	Sub- groups	Frequency (n)	Percentage (%)
Age group	<= 20	33	13.2
	21 – 25	90	36.0
	26 – 30	93	37.2
	31 – 35	27	10.8
	>= 36	7	2.8
Mother education	Illiterate	47	18.8
	Primary	96	38.4
	Secondary	65	26
	Higher secondary	34	13.6
	Graduation	7	2.8
	Post Graduation	1	0.4
Husband's education	Illiterate	27	10.8
	Primary	66	26.4
	Secondary	90	36.0
	Higher secondary	46	18.4
	Graduation	19	7.6
	Post Graduation	2	0.8
Mother occupation	Housewife	180	72.0
	Monthly salaried unorganized worker	15	6.0
	Monthly salary organized worker	3	1.2
	Engaged in family business	2	0.8
	Self-employed	8	3.2
	Engaged in farming	13	5.2
	Daily wage work	29	11.6
Socio-economic status (Modified BG Prasad's Classification)	Upper class	6	2.4
	Upper-middle class	28	11.2
	Middle class	89	35.6
	Lower-middle class	102	40.8
	Lower class	25	10.0

Awareness on various maternal health programs in Figure 1 shows Anemia Mukht Bharat, JSSK, and NIS had high awareness with 94.8%, 92.4% and 96.4% respectively, mothers had good awareness of these programs. While awareness on ICDS, PMSMA and JSY was 82.0%, 81.6% and 87.2% respectively. Lowest level of awareness was found in PMMVY with 69.2%. Utilization of maternal services in Table 2 shows under Anemia Mukht Bharat mothers

received IFA (95.6%), albendazole (91.6%) and counselling for fortification of food (80.8%). Maternal vaccination for Td/TT under NIS was 100%. ICDS services was availed by 84.0% of mothers receiving Take Home Ration. PMSMA program was availed by 92.8% of mothers who visited for identifying of high-risk pregnancy. Mothers who received incentive under JSY and PMMVY were 81.2% and 47.6 % respectively.

**Figure 1 Distribution of awareness on Maternal Programs.**

**Table 2 Distribution of utilization of maternal services (N=250)**

Services	Service utilized	
	No. (n)	Percentage (%)
Received IFA during pregnancy under Anemia Mukth Bharat	239	95.6
Received Albendazole under Anemia Mukth Bharat	229	91.6
Counselling for fortification of food under Anemia Mukth Bharat	202	80.8
Maternal vaccination for Td/TT under NIS	250	100.0
Received Take Home Roshan (THR) under ICDS	210	84.0
Monthly visit under Pradhan Mantri Surakshit Matritva Abhiyan	232	92.8
Received incentive under JSY	203	81.2
All maternal benefits Janani Shishu Suraksha Karyakram	133	53.2
Received incentive under Pradhan Mantri Matru Vandana Yojana	119	47.6

Table 3 shows association of MCH program utilization with mode of delivery. The study found among mothers who used JSY, 17.7% had Caesarean section compared to 40.4% who didn't use JSY. The full use of maternal benefits under JSSK, 18.0% had assisted delivery compared to 31.6% who didn't use JSSK services. Mothers who

availed PMMVY, 12.6% had C.S. compared to 30.5% who didn't use PMMVY. Significant association between the mode of delivery and the use of all maternal benefits under JSSK, JSY and PMMVY suggesting that women who took advantage of all maternal programs had a higher chance of normal delivery.

**Table 3 Association of MCH Programs utilization with mode of delivery.**

		Mode of delivery (n=250)			P value
		Normal	Assisted	Caesarean section (C.S.)	
<b>JSY Utilisation</b>	Yes	110 (54.2)	57 (28.1)	36 (17.7)	0.001
	No	24 (51.1)	4 (8.5)	19 (40.4)	
<b>All maternal benefits of JSSK</b>	Yes	79 (59.4)	24 (18.0)	30 (22.6)	0.038
	No	55 (47.0)	37 (31.6)	25 (21.4)	
<b>PMMVY availed</b>	Yes	71 (59.7)	33 (27.7)	15 (12.6)	0.003
	No	63 (48.1)	28 (21.4)	40 (30.5)	

Table 4 shows that 95.6% of mothers who received IFA during pregnancy had 82.0% babies with normal birth weight and 16.3% had LBW babies, while those who didn't receive IFA in pregnancy had 18.2% normal babies and 54.5% LBW babies at birth. Among the participants, 44.8% of the mothers who received Take Home Roshan (THR) whenever the stock was available, 84.8% of the mother's delivered babies with normal birth weight, and 13.4% gave birth to LBW babies.

However, those who did not receive THR, 47.5%, gave birth to normal-weight babies and 45.0% delivered LBW babies. Association between receiving IFA tablets during pregnancy and frequency of receiving THR in relation to birth weight were found to be statistically significant suggesting receiving IFA and THR during pregnancy to mothers have high chance of delivery of normal birth weight baby.

**Table 4 Association of various MCH Programs utilization with Birth weight of babies.**

		Birth-weight Category (n=250)				Total	P value
		VLBW	LBW	Normal	Macro.		
<b>Did you get IFA tablets during pregnancy?</b>	Yes	n	2	39	196	2	< 0.001
		%	0.8	16.3	82.0	0.8	
	No	n	3	6	2	0	
		%	27.3	54.5	18.2	0.0	
<b>Frequency of receiving THR</b>	Monthly	n	1	12	84	1	< 0.001
		%	1.0	12.2	85.7	1.0	
	Whenever the stock was available	n	1	15	95	1	
		%	0.9	13.4	84.8	0.9	
	Not received	n	3	18	19	0	
		%	7.5	45.0	47.5	0.0	

## DISCUSSION

On studying the age distribution of mothers it was observed that 13.2% mothers were less than or equal to 20 years olds while 84% were in 21-35 years of age and 2.8% were in greater than or equal to 36 age group compared to 57% were in the 21–25 year age group by Danasekaran et al.(7) and 65% of participants were in the 18-25 age group by Chaurasiya et al.(8) Comparing literacy this study found that 18.8% of mothers and 10.8% of husbands were illiterate, which is lower than the 22.2% for mothers and 37.4% for fathers reported by Gupta et al.(9) while Chaurasiya et al.(8) found that only 14.0% of mothers were illiterate and Saha et al.(10) reported that 33.8% of women were illiterate.

On studying occupation of mothers, it was observed that 72% were housewife followed by daily wage workers i.e. 11.6%. Danasekaran et al.(7) reported that 37.6% of mothers were housewives, that is lower than this study, while 45.42% were unskilled workers, indicating a significant proportion of women engaged in informal labour.

In present study almost half of the subjects belonged to lower middle and lower class (Modified BG Prasad March 2023) i.e. 40.8% and 10.0% respectively. Chavan et al.(11) found that 96.82% of participants were from lower socio-economic backgrounds according to modified Kuppaswami classification 2016, which was much higher than our study.

On studying awareness and utilization on various maternal programs. It was observed that 94.8% of women were aware about Anemia Mukth Bharat Program while IFA was received by 95.6% of mothers during their antenatal period while study by Singh et al.(12) noted that 47.7% of mothers received IFA supplementation and Saha et al.(10) reported 59.7% of ANC mothers received IFA which is much lower than in our study. Albendazole given for deworming was consumed by 91.6% of mothers in the present study which is higher as compared to Kumar et al.(13) where deworming was just 50.1%. In the present study, counselling on food fortification was received by 80.8% similar to the findings in the study by Saha et al.(10) in Gujarat, where counselling women that is on iron fortification was 73.9%. Regarding maternal immunization coverage 96.4% women were aware regarding National Immunisation Schedule while 100.0% were immunised in this study this difference in awareness and utilization may be due to study being done among registered females. It was observed that immunization coverage was lower in other studies such as 84.0% immunization coverage was reported by Saha et al.(10) and 72.6%

was reported by Singh et al.(12), a study by Danasekaran et al.(7) in Tamil Nadu states 64.0% for maternal vaccination, which was also lower compared to this study. In present study 82% of the study subjects were aware about various components of ICDS while 84% received THR under ICDS, Biswas et al.(14) shows awareness of ICDS was similar to this study. Also, THR utilization was similar to the findings of Nair et al.(15) in Tamil Nadu whereas 84.0% used THR reported by Chavan et al.(11) in Maharashtra. On analysing mode of delivery in relation to Utilization of JSY, JSSK utilization and PMMVY it was observed that C.S. was less than 17.7% in women who utilised JSY services this may be due to early detection of high-risk cases and timely management. No other studies found to compare mode of delivery with these variables but it is quite evident that maternal programs help in better outcomes.

On analysing birth weight of baby in relation to IFA consumption in pregnancy, among mothers who received IFA during pregnancy 82.0% had babies with normal birth weight and 16.3% had LBW babies while mothers who dint receive IFA during pregnancy had normal 54.5% LBW babies at birth. Indicating consumption of IFA affect the birth weight of the baby hence consumption of IFA is of utmost importance and should be promoted by all means.

Comparing birth weight of baby in relation to Frequency of receiving Take Home Ration (THR) this study found the mothers received THR whenever the stock was available among them only 13.4% babies were Low birth weight (LBW) while among those who didn't receive THR, 45.0% delivered LBW babies. Indication THR affects the nutritional status of mothers and baby thus affecting birth weight of the baby therefore mothers must use THR for healthy birthweight of baby.

## CONCLUSION

The study concludes that awareness and utilization of maternal programs was higher in this study compared to other studies. Mother who had knowledge of programs had better utilization of its services having better outcomes. Among utilization of services 100.0% of females had taken TT/Td immunization and 92.0% of females had received IFA tablets under Anaemia Mukth Bharat. Those females who were utilizing programs such as JSY, JSSK and PMMVY had more chances of normal delivery than caesarean section. Among those mothers who received IFA tablets and Take Home Ration under ICDS during pregnancy delivered normal birth weight babies as compared to those

who did not receive delivered Low birth weight babies.

### RECOMMENDATION

All programs running for improving maternal and child health should be merged into one streamline program to make it more effective which would address all benefits of the programs starting from adolescent age and continuing throughout the reproductive age which would also help in monitoring their health.

### LIMITATION OF THE STUDY

Participant selection was based on institutional deliveries, As a result, the findings may not fully represent all mothers in the study area. Additionally, a study with a larger and more diverse sample would be necessary to enhance the generalizability and statistical strength of the results.

### RELEVANCE OF THE STUDY

This study highlights the relationship between the awareness and utilization of maternal health services and improved maternal and child health. It was observed that mothers who availed services under various maternal health programs had healthier babies and fewer complications. The findings underscore the positive impact of these services on maternal and child health, particularly in under-resourced rural settings. This study provides local evidence linking service use with health outcomes. Emphasizing need for targeted community-level efforts to promote and enhance the utilization of maternal and child health programs in high-burden districts.

### AUTHORS CONTRIBUTION

All authors have contributed equally.

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Nil

### CONFLICT OF INTEREST

There are no conflicts of interest.

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### DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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