

Utilization of the PMSMA Scheme and Its Impact on Current Pregnancy Outcomes Among Postnatal Mothers in Rural Areas of NCR, India

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Abstract

Background: Maternal and neonatal morbidity and mortality remain major public health concerns, particularly in rural areas with limited access to quality antenatal care. The Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), launched in 2016, aims to provide comprehensive antenatal care and early identification of high-risk pregnancies through specialist services on the 9th of every month. This study aimed to assess the utilization of PMSMA and its impact on pregnancy outcomes among postnatal mothers in rural areas of Ghaziabad, NCR, India. **Material & Methods:** A cross-sectional study was conducted among 327 postpartum women in rural Ghaziabad, NCR, from August 2025 to January 2026. Data were collected using a pre-designed semi-structured questionnaire through face-to-face interviews after obtaining informed consent. Data were entered in MS Excel and analyzed using SPSS version 31.0. Chi-square test was applied, and p-value < 0.05 was considered statistically significant. **Result:** Out of 327 participants, 240 (73.4%) utilized PMSMA services, while 87 (26.6%) did not. Lack of awareness (47.1%) and preference for private consultation (46.0%) were the main reasons for non-utilization. PMSMA utilization was significantly associated with higher live births ($p=0.02$). No significant association was found with mode of delivery, birth weight, NICU admission, or delivery complications. However, odds ratios indicated a protective effect against stillbirth (OR=0.207), abnormal birth weight (OR=0.633), and delivery complications (OR=0.421). **Conclusion:** PMSMA utilization was relatively high in rural Ghaziabad, NCR; however, lack of awareness remains a key barrier. Strengthening community awareness and outreach through frontline health workers may further improve utilization and maternal and neonatal outcomes.

Keywords: PMSMA, Utilization, Pregnancy outcomes, Rural, Impact.

Introduction

As per the World Health Organization (WHO), more than 2.6 lakh women lose their lives globally each year due to causes related to pregnancy, childbirth, or the postpartum period.^[1]

Developing countries accounted for approximately 90% of maternal deaths from high-risk pregnancies, with the majority occurring in rural and slum areas.^[2] All high-risk pregnancies should be screened carefully by obstetricians from the start of pregnancy to avoid any mishaps, failing which they may progress to maternal near-miss cases.^[3,4] The most commonly identified causes of maternal deaths are hemorrhage, infections, ruptured uterus, hepatitis, anemia and hypertension disorders.^[5] As per WHO, the global maternal mortality ratio (MMR) in 2023 was 197.^[1] The current MMR is 88 and 141 in India and Uttar Pradesh, respectively.^[6] The Sustainable Developmental Goals (SDGs) target a reduction to 70 by 2030 globally, with no country having a maternal mortality ratio more than twice the global average.^[4,6]

Early detection along with effective management of high-risk

pregnancies can significantly contribute to the reduction of unfavorable maternal and fetal outcomes and hence help to achieve the targets.^[7,8]

There is a great challenge in rural areas to deal with high-risk pregnancies with many barriers like lack of accessibility, inadequate antenatal care by specialists, lack of awareness, financial constraints and socio-cultural practices that prioritize family obligations over personal health. Apart from many socio-economic and cultural challenges, there is a high incidence of malnutrition, inadequate healthcare infrastructure and infections responsible for adverse pregnancy outcomes.^[9,10]

The Ministry of Health and Family Welfare of India (MoHFW) initiated the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) in 2016 to identify high-risk pregnancies and offer all women in the second and third trimester of their pregnancies free pregnancy care services on the 9th of every month.^[11,12] This helps in the identification and tracking of high-risk pregnancies, provision of monthly antenatal contacts by a

specialist, and effective management even in remote rural areas and thus aids in the determination of the best course of action in time by appropriate health professionals.

Relevance of the study

Despite the implementation of PMSMA, there is limited evidence regarding the effectiveness of PMSMA in improving pregnancy outcomes in rural settings.

Material & Methods

Aim

To assess the utilization of the PMSMA scheme and its impact on pregnancy outcomes among postnatal mothers in rural areas of the National Capital Region, India.

Study Design

This was a cross-sectional study conducted over a period of 6 months from August 2025 to January 2026.

Sampling Technique

A multistage random sampling technique was used.

Sample Size

The sample size for the current study was determined based on the study conducted by Jaideep K.C., et al in Belgavi, Karnataka, 2017, where the prevalence of high-risk pregnancies was calculated as 30.7%.^[13] Sample size was calculated by Fisher's Formula: $n = \frac{(Z^2 \cdot p(100-p))}{d^2}$

Where, n= Sample Size, Z=1.96 (95% confidence interval), p=30.7%, d= Absolute precision = 5%.

Thus, $\frac{((1.96 \times 1.96) \times 30.7(100-30.7))}{(5 \times 5)}$

n= 326.7. That is n=327

The required sample size came out to be 327.

Study Setting

This study was carried out in

- 1) Rural areas of Ghaziabad district, NCR.
- 2) Department of Community Medicine, Santosh Medical College in district Ghaziabad, NCR.

Study Participants

Women in the postpartum period residing in the selected village.

Inclusion Criteria

Postpartum women of the age group 15-45 years who were permanent residents in selected rural areas of district Ghaziabad, NCR.

Exclusion Criteria

Women not available during visits.

Women who were not willing to participate in the study or refused to give written informed consent for the study.

Material & Methods

The list of study subjects in the selected village was collected from the ASHA and ANM workers, and the investigator

interviewed these women.

All participants provided written informed consent after being informed of the study's objectives.

Ethical Consideration

Ethical approval was obtained from the Institutional Ethical Committee.

written informed assent was obtained for adolescent participants (<18 years) alongside guardian/parental written consent.

Informed consent was taken from all study participants (>18 years).

Data Analysis

The data were collected and entered in MS Excel 2016. Analysis was done with the appropriate statistical method using SPSS software version 31.0. The chi-square test was used to assess the association between variables. A P-value <0.05 was considered statistically significant.

Results

Figure 1 depicts the age distribution of the study participants (in years). The majority of participants, 236 (72.2%), were between the ages of 18 and 30, with 86 (26.3%) being beyond the age of 30. 5 (1.5%) participants were found to be below 18 years of age.

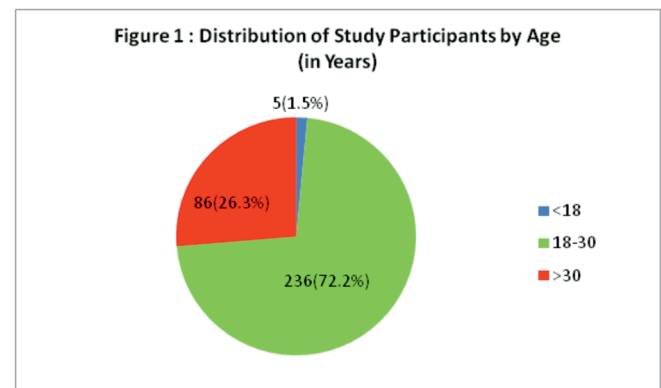


Table-1: Distribution of Study Participants According to usage of PMSMA Scheme and reasons of not using the Scheme

S. No.	PMSMA Scheme	Number (n= 327)	Percentage (%)
1	Yes	240	73.4
2	No	87	26.6
	Total	327	100.0
Reasons of not using			
1	Did not know	41	47.1
2	Did not want	6	6.9
3	Taking Private consultation	40	46
	Total	87	100.0

Table 1 depicts the utilization of the PMSMA scheme among the study participants. Majority of women, 240 (73.4%), availed the benefits of the PMSMA scheme during pregnancy. However, 87 (26.6%) participants did not utilize the scheme. The most common reason was lack of awareness about the scheme, reported by 41 women (47.1%), followed by preference for private consultation among 40 (46.0%) women, while 6 (6.9%) women did not want to avail PMSMA services.

Table 2: Association between utilization of PMSMA Scheme and Birth Outcome

Are you using PMSMA Scheme	Birth Outcome			Odds Ratio, CI (95%)	χ^2 -value, d.f., P-Value
	Still Birth	Live Birth	Total		
Yes	3 (1.3%)	237(98.8%)	240(100%)	0.207,	5.411,0.02
No	5 (5.7%)	82 (94.3%)	87 (100%)	(0.03-1.09)	

Table 2 depicts the association between utilization of PMSMA scheme and pregnancy outcome. Among PMSMA users, 237 (98.8%) had live births and 3 (1.3%) had stillbirths. In contrast, among non-users, 82 (94.3%) resulted in live births and 5 (5.7%) in stillbirths. A higher proportion of live births was observed among PMSMA users and the association was found to be statistically significant ($\chi^2 = 5.41$, $df = 1$, $p = 0.02$). Women using PMSMA had lower odds of having a stillbirth compared to women not using the PMSMA scheme (OR = 0.207).

Table 3 : Association between utilization of PMSMA scheme and Pregnancy Outcomes

Utilization of PMSMA Scheme	Mode of Delivery			Odds Ratio, CI (95%)	χ^2 -value, d.f., P-Value
	LSCS	Normal Vaginal Delivery	Total		
Yes	103(42.9%)	137(57.1%)	240(100%)	0.88	0.243,
No	40(45.9%)	47(54.1%)	87(100%)	(0.521.49)	1, 0.62
Utilization of PMSMA Scheme	Birth weight			Odds Ratio, CI (95%)	χ^2 -value, d.f., P-Value
	Abnormal Birth weight*	Normal Birth weight	Total		
Yes	34(14.2%)	206(85.8%)	240(100%)	0.633	2.031,
No	18(20.7%)	69(79.3%)	87(100%)	(0.321.27)	1,0.15
Utilization of PMSMA Scheme	NICU Admission			Odds Ratio, CI (95%)	χ^2 -value, d.f., P-Value
	Yes	No	Total		
Yes	29(12.1%)	211(87.9%)	240 (100%)	0.950	0.018,
No	11(12.6%)	76(87.4%)	87 (100%)	(0.432.21)	1,0.891
Utilization of PMSMA Scheme	Complications during Delivery			Odds Ratio, CI (95%)	χ^2 -value, d.f., P-Value
	Yes	No	Total		
Yes	6(2.5%)	234(97.5%)	240(100%)	0.421	2.071,
No	5(5.7%)	82(94.3%)	87 (100%)	(0.10-1.79)	1,0.150

*Abnormal Birth weight includes both Low Birth Weight & Fetal Macrosomia.

Table 3 shows the association between utilization of the PMSMA scheme and Pregnancy Outcomes. With respect to Mode of delivery, among 240 PMSMA users, 103 (42.9%) underwent LSCS and 137 (57.1%) had normal vaginal delivery. In contrast, among 87 non-users, 40 (45.9%) had LSCS and 47 (54.1%) had normal vaginal delivery. Although a slightly higher proportion of normal vaginal delivery was observed among PMSMA users, the association between utilization of the PMSMA scheme and mode of delivery was not found to be statistically significant ($\chi^2 = 0.243$, $df = 1$, $p = 0.62$). However, women utilizing the PMSMA scheme had slightly lower odds of undergoing LSCS compared to non-users (OR = 0.88, CI = 0.52-1.49).

Regarding birth weight, among PMSMA users, 206 (85.8%) had normal birth weight and 34 (14.2%) had abnormal birth weight. In comparison, among non-users, 69 (79.3%) had normal birth weight and 18 (20.7%) had abnormal birth weight. Although normal birth weight was more commonly observed among PMSMA users, the association between utilization of the PMSMA scheme and birth weight was not statistically significant ($\chi^2 = 2.031$, $df = 1$, $p = 0.15$). But women using PMSMA had lower odds of having babies with abnormal birth weight compared to non-users (OR = 0.633, CI = 0.32-1.27).

In terms of NICU admission among 240 PMSMA users, 29 (12.1%) newborns required NICU admission, while 211 (87.9%) did not. Among 87 non-users, 11 (12.6%) newborns required NICU admission and 76 (87.4%) did not. The proportions of NICU admission were almost identical in both groups. The association between utilization of the PMSMA scheme and NICU admission was not found to be statistically significant ($\chi^2 = 0.018$, $df = 1$, $p = 0.891$). However, women using PMSMA had slightly lower odds of NICU admission compared to women not using the PMSMA scheme (OR = 0.950, CI = 0.43-2.21).

On assessing complications during delivery, among PMSMA users, 6 (2.5%) women experienced complications during delivery, while 234 (97.5%) had no complications out of 240(100%). Among non-users, 5 (5.7%) women had complications and 82 (94.3%) had no complications out of 87(100%) deliveries. Although complications were slightly less common among PMSMA users compared to non-users, the association between utilization of the PMSMA scheme and complications during delivery was not found to be statistically significant ($\chi^2 = 2.071$, $df = 1$, $p = 0.150$). Women using PMSMA had lower odds of experiencing complications during delivery compared to non-users (OR = 0.421, CI = 0.10-1.79).

Discussion

The majority of participants, 236 (72.2%) were between the ages of 18 and 30 with 86 (26.3%) being beyond the age of 30. However, five (1.5%) participants were younger than 18 years which is a matter of concern indicating occurrence of adolescent pregnancy in rural Ghaziabad, NCR. The age distribution of our study is comparable with the findings of K.C.J

et al. (2017),^[13] who conducted a study at Belgavi, Karnataka, reported that the majority of pregnant women (88%) were in the age group of 20-29 years, with only 7% being adolescents and 5% aged more than 30 years, indicating a similar reproductive age pattern in rural settings. Mogan et al. (2023)^[8] conducted a study in a PHC at Fatehpur Beri, Delhi, and also reported that the majority of pregnant women were within the younger reproductive age group of 21-25 years, although a comparatively higher proportion of adolescent pregnancies (18.5%) was noted. However, efforts should be made to sensitize women for the optimal age of conception, as 5 women in our research were under the age of 18.

The utilization of the PMSMA scheme was reported by 240 (73.4%) participants, while 87 (26.6%) women did not avail the scheme. Similarly, Mandal et al. (2021),^[14] who conducted a study in Malda, West Bengal noted that 608 (79%) women were receiving PMSMA services and 162 (21%) were not accessing the scheme. In contrast, a study by Pragya et al. (2019)^[15] in North Karnataka had a significantly lower use rate, with only 32.0% of women using PMSMA services. The present study's substantially greater PMSMA utilization may be attributed to increased awareness, more efficient distribution systems, and stronger integration of PMSMA services into the local healthcare system.

Lack of awareness and preference for private consultation emerged as the main reasons for non-utilization of PMSMA services in the study, indicating that informational gaps and healthcare preferences appear to strongly influence service uptake and no comparable studies assessing this association were available for further comparison.

PMSMA utilization was higher among women who had live birth (98.8%) as compared to those who had stillbirth (1.3%) and the association was statistically significant ($p = 0.02$). However, Mandal et al. (2021)^[14] in a study conducted in Malda, West Bengal, reported no statistically significant association between pregnancy outcome and utilization of PMSMA ($p = 0.129$). The inconsistency in statistical significance across studies suggests that PMSMA use may not independently predict pregnancy outcome. However, odds ratio was 0.207, indicating that PMSMA utilization had a protective effect against still birth. (Table 2)

PMSMA utilization was similar among women who had normal vaginal delivery (57.1%) and those who underwent LSCS (42.9%), but the association was not statistically significant ($p = 0.62$). Similar findings were reported by Priya et al. (2021)^[16] in a study conducted at a tertiary health centre in Telangana. However, odds ratio was 0.88, indicating that women utilizing the PMSMA scheme had a protective effect against LSCS.

PMSMA utilization was higher among women with normal birth weight babies (85.8%) as compared to those with abnormal birth weight babies (14.2%) but the association was not statistically significant ($p = 0.15$). Similar findings were reported

by Priya et al. (2021),^[16] suggesting that despite utilization of PMSMA services, birth weight may not differ significantly as it is influenced by multiple factors operating throughout pregnancy, and a single program may not be sufficient to produce measurable differences. However, odds ratio was 0.633, indicating that women utilizing the PMSMA scheme had a protective effect against abnormal birth weight.

PMSMA utilization was similar among women whose newborns required NICU admission (12.1%) and those who did not require NICU admission (87.9%), and the association was not statistically significant ($p = 0.891$). No comparable studies analyzing this specific relationship were available for further comparison.

PMSMA utilization was lower among women who had complications during delivery (2.5%) as compared to those who did not have complications (97.5%) but the association was not statistically significant ($p = 0.150$). However, odds ratio was 0.421, indicating that women utilizing the PMSMA scheme had a positive impact against complications during delivery.

Conclusion

The present study demonstrates a high level of utilization of the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) scheme among postpartum women in rural Ghaziabad, NCR, with 73.4% of participants availing the services during pregnancy. The scheme shows a significant positive impact on pregnancy outcomes, particularly in achieving a higher proportion of live births. The utilization of the scheme also showed a protective effect on outcomes like delivery through LSCS, abnormal birth weight and maternal complications during delivery ($OR < 1$).

Recommendation

Health authorities must prioritize motivating all pregnant women to utilize PMSMA services to prevent adverse outcomes. Strengthening outreach through frontline health workers and ensuring consistent access to specialists on the 9th of every month will help bridge gaps in care and further improve maternal health.

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Declaration of Generative Ai And Ai-assisted Technologies in the Writing Process: None

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