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“A Cross–Sectional Study Assessing The Prevalence Of High–Risk Pregnancy Among Pregnant Women Enrolled In The Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) & Their Awareness On Maternal Health Services At Government Facility In Gautam Budh Nagar District Of Uttar Pradesh”.

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Abstract:

Background: High–risk pregnancies (HRP) need quick and effective healthcare. Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) an Indian maternal health program offers antenatal care especially for, High–Risk Pregnancies (HRP). PMSMA–enrolled pregnant women's HRP prevalence and knowledge of government maternal health measures are unclear. This study assess the prevalence of high–risk pregnancies, evaluate maternal health service awareness, and explore influencing factors among PMSMA–enrolled women.

Methods: The Jewar Primary Health Centre (PHC) in Gautam Budh Nagar district, an NIIMS Rural Health Training Centre (RHTC), was chosen to undertake a cross–sectional study on PMSMA–registered pregnant women from October 23 to Jan 2024. Sociodemographic, obstetric, maternal health, and high–risk pregnancies were obtained using a standard questionnaire. High–risk pregnancies may be predicted by medical and obstetric risk factors. Data was analysed using descriptive statistics and statistical tests to discover variable relationships.

Results: PMSMA–enrolled pregnant women had 35% high–risk pregnancies. The mother's education, age of marriage, and other sociodemographic characteristics affected her high risk status. 42% knew about PMSMA and government maternal health services. ASHA contributed 28% of 42% awareness.

Conclusion: This research enhances our knowledge of high–risk pregnancy and

maternal health care awareness among PMSMA-enrolled pregnant women in Gautam Budh Nagar, UP. Improving maternal health care knowledge and usage, especially among high-risk pregnant women, requires targeted interventions. Maternal health education and outreach will enhance maternal and newborn outcomes in the Gautam Budh Nagar district, strengthening PMSMA.

Key Words: 1) High Risk Pregnancy (HRP), Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), 3) Prevalence, 4)Antenatal Care (ANC), 5) Maternal Mortality Ratio (MMR)

Introduction

High-risk pregnancies, known as HRPs, present notable threats to both maternal health and fetal well-being, requiring specialized medical attention and intervention. The Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), initiated in 2016, is a government maternal health initiative. It provides antenatal care (ANC) services to pregnant women across the nation, originally scheduled on the ninth day of each month. Recently, the program has been extended to include an additional day, now taking place on the 24th of every month, and is referred to as the extended PMSMA.[1]. PMSMA includes screening, identification, line listing, and adequate management of high-risk pregnancies by Obstetrics and Gynaecology (OBGY)/ Comprehensive Emergency Obstetric Care (CEmOC)/ Basic emergency obstetric care (BEmOC) experts, as well as referral to appropriate higher institutions [1]. According to published studies, between 20 and 30 percent of pregnancies are classified as high risk. This group accounts for 75 percent of all prenatal morbidity and mortality in India [1]. However, according to the PMSMA reporting platform, only 14 percent of pregnancies are currently classified as "High Risk," and this figure varies widely by state [1]. With an estimated 30,000 maternal fatalities per year throughout the nation, high Maternal Mortality Ratio (MMR) remains a major source of worry [2]. According to the Sample Registration System (SRS) 2018–20 Maternal Mortality Bulletin, India's MMR is 97 per 1 lakh live births [2], which has likely met the National Health Policy (NHP) 2017 objective of 100 per 1 lakh live births by 2020 [3], but still has a long way to go to meet the Sustainable Development Goals (SDG) 3.1 target of 70 per lakh live births [4]. As a consequence, it is critical to offer each pregnant woman with excellent ANC, to identify HRPs, and to monitor them for counselling, treatment, birth preparation, and referral until the outcome is known in order to close the loop. The prevalence of high-risk pregnancies and pregnant women's understanding of maternal health treatments at government facilities in some parts of North India, on the other hand, remains mostly unknown. Understanding these features is crucial for improving the effectiveness of antenatal care programs and reducing unfavourable outcomes for mothers and newborns. The primary goal of this cross-sectional study is to estimate the prevalence of high-risk pregnancies among pregnant women participating in the PMSMA initiative in the Uttar Pradesh district of Gautam Budh Nagar.

The following are the study's particular objectives:

- To estimate the prevalence of high-risk pregnancy among pregnant women enrolled in the PMSMA programme using established criteria as per PMSMA guidelines.
- To evaluate pregnant women enrolled in the PMSMA program's understanding of maternal health care services provided by government institutions.
- To investigate the factors that influence the prevalence of high-risk pregnancies among enrolled women. This may include socio-demographic factors, educational background, healthcare access, and utilisation of prenatal care services.

By attaining these objectives, this research hopes to provide significant insights about the prevalence of high-risk pregnancies and pregnant women's knowledge of maternal health services in India.

Material and Method

The research used a cross-sectional design to estimate the prevalence of high-risk pregnancies and pregnant women's knowledge of maternal health care services at Jewar PHC of Gautam Budh Nagar District of Uttar Pradesh which happens to be Rural Health Training Centre (RHTC) of Department of Community Medicine of Noida International Institute of Medical Sciences (NIIMS). Pregnant women registered in the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) programme in the year 2022 were contacted in the period between October 2023 to January 2024. The sample size was computed based on 25% prevalence¹ of high-risk pregnancies and 15% permissible error was considered, with a desired degree of accuracy and 95% confidence interval. A line list of 1122 pregnant women were taken and out of that 550 pregnant women were enrolled in the study using systematic random sampling approach. Data collection took place via the administration of a standardised questionnaire to the pregnant women who were chosen. The questionnaire was created using established principles and past research, and it was pre-tested and verified before being implemented. The questionnaire had questions on socio-demographic factors, obstetric history, maternal health service awareness, and prenatal care use. In addition to the questionnaire, the enrolled women's relevant medical records was also checked to validate their high-risk pregnancy status and acquire further clinical information. Data Analysis: Descriptive statistics was used to summarise pregnant women's socio-demographic characteristics, the prevalence of high-risk pregnancies, and their degree of awareness. The percentage of high-risk pregnancies was computed based on 13 established criteria mentioned in PMSMA guidelines as mentioned below; [5]

1. Severe Anaemia (Hb less than 7gm/dl)
2. Pregnancy induced hypertension, pre-eclampsia, Pre-eclampsic toxaemia
3. Syphilis/ HIV Positive
4. Gestational Diabetes Mellitus
5. Hypothyroidism
6. Young primi (less than 20 years) or Elderly gravida (more than 35 years)
7. Twin / Multiple pregnancy
8. Malpresentation
9. Previous LSCS
10. Low lying placenta, Placenta previa
11. Positive Bad obstetric history (History of still birth, abortion, congenital malformation, obstructed labour,
12. Rh negative
13. Patient with History of any current systemic illness(es)/past history of illness

Chi-Square test was used to find the relationship between high-risk pregnancies and other characteristics such as age, education, and antenatal care use. The degree of maternal health care services awareness among pregnant women was also assessed. The institutional review board has provided ethical approval. Before collecting data, each participant were asked to provide informed consent. Throughout the research, participants' confidentiality and privacy was protected.

Results:

Table 1 details out sociodemographic variables in the study. Of the 550 pregnant women enrolled in PMSMA, 66% (361) are between the ages of 20 and 24, while 24% (133) are between the ages of 25 and 29. 5% (29) are also pregnant as teenagers (15–19 years old). 483 pregnant women (88%) practise Hinduism, while the remaining 67 (12%) practise Islam. 57% of females (312) claimed they lived in a joint family, 36% (200) in a nuclear family, and the remainder 7% (38) belong to three generation family. (Figure 1). 77% (427) of the females are from the middle class or below, and 62% (342) have a high school and above education status (Figure 1). We calculated that 190 pregnant women (35%) are at high risk based on 13 documented factors as per PMSMA criteria for HRP (Figure 2). Further investigation revealed that severe anaemia (36% 69), followed by a positive unfavourable obstetric history (24% 46), caused more than 50% of HRP (Figure 3). Term delivery accounted for 81% (439) of all deliveries. Normal vaginal delivery accounted for 84% of all deliveries, with 8% each for LSCS and Assisted vaginal delivery. 96% (529) were livebirths, whereas 4% (21) were stillbirths or abortions. 94% (499) of livebirths weighed 2.5 kg or more, with the remaining 6% (30) being LBW. According to the survey, 42% (231 pregnant women out of 550) of pregnant women engaged in the PMSMA programme were aware of various maternal health services offered at Jewar PHC.

Table 2: shows the relationship between sociodemographic characteristics, pregnancy outcome (obstetric and neonatal outcome), and awareness level and high risk pregnancy. Education of pregnant women ($p < 0.0001$), age distribution of pregnant women ($p < 0.0001$), and age at first delivery ($p < 0.0001$) were shown to be substantially linked with high risk pregnancy among sociodemographic characteristics. Type of delivery ($p < 0.0001$) was shown to be substantially linked with high-risk pregnancy across obstetric outcomes. Among the neonatal outcomes, birth weight of the infant ($p < 0.0001$), and birth status ($p < 0.0001$) were related with high-risk pregnancy. Other maternal health care awareness ($p < 0.0001$) was also shown to be substantially connected with high risk pregnancy.

Discussion:

Our study revealed a substantial prevalence of high-risk pregnancies (HRP), with 35% of pregnant women falling into this category. This prevalence is consistent with previous research findings. For instance, Prajapati et al. reported a prevalence of 40.5% [6], Jaideep et al. observed 30.7% [7], Bharti et al observed 31.4% in Rohtak Haryana [8] and Mehta et al. found 31.4% [9]. Jadhao et al. conducted a similar study in Nagpur and reported a prevalence of 33.64% [10], while Antara et al. found a remarkably high prevalence of 90.70% among antenatal women attending HRP days [11] whereas Mufti et al. reported an incidence of 15% in Kashmir [12].

Our study identified severe anaemia and a positive adverse obstetric history as significant contributors to high-risk pregnancies (HRP), consistent with previous literature. Verma et al. observed symptoms of anaemia in 87.3% of study participants [13], and Jaideep et al. found a history of negative obstetric outcomes in approximately 60% of subjects [7]. Prompt identification and management of these risk factors are crucial for preventing HRP.

Several sociodemographic factors, including educational attainment, maternal age, and age at first birth, were significantly associated with HRP, consistent with prior research. This underscores the importance of considering sociodemographic factors in predicting HRP outcomes.

We also found a notable correlation between the mode of delivery and HRP in relation to obstetric outcomes, consistent with previous research. Significant associations were observed between

high-risk pregnancies and neonatal outcomes, suggesting the potential for interventions targeting HRP to improve neonatal outcomes.

One notable finding from our study is the increased occurrence of preterm and post-term births in high-risk pregnancies, which differs from the findings of a previous study conducted in Nagpur [10]. This warrants further investigation, potentially involving multiple centers, to understand the underlying factors contributing to this discrepancy.

In conclusion, our study highlights the widespread occurrence of HRP and emphasizes the importance of ongoing surveillance and specialized medical attention. Identifying and managing risk factors, as well as considering sociodemographic factors, are crucial for mitigating HRP-related complications and improving maternal and neonatal health outcomes.

Conclusion:

In summary, our study offers significant findings regarding the occurrence and determinants of high-risk pregnancy. The identified findings have the potential to provide valuable guidance for the development of specific interventions aimed at effectively managing and decreasing the occurrence of HRP. Continued research in this field is of utmost importance, with a specific emphasis on longitudinal and interventional studies. Such studies are necessary to gain a deeper understanding of these associations and to devise successful strategies aimed at enhancing maternal and neonatal health outcomes.

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Nil.

Conflicts of interest

There are no conflicts of interest.

Summary: The research examined high-risk pregnancies (HRP) among pregnant women in Gautam Budh Nagar, Uttar Pradesh, participating in the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA). Cross-sectional data were acquired using standardised questionnaires and medical record inspections. Based on criteria, 35% of the 550 pregnant women in the research were high-risk. A positive unfavourable obstetric history and severe anaemia contributed to high-risk pregnancies. Education, age distribution, and first delivery age were linked to high-risk pregnancies. Mode of delivery, neonatal outcomes (birth weight and birth status), and maternal health care knowledge also predicted high-risk pregnancies.

Recommendations:

- **Improved Screening and Management:** Improve screening techniques to identify high-risk pregnancies, focusing on severe anaemia and unfavourable obstetric history. Customise high-risk pregnancy care strategies for timely and appropriate treatments.
- **Health Education Targets:** Create focused health education programmes to educate pregnant women about maternal health services and prenatal care. These activities should target sociodemographic gaps and promote high-risk pregnancy screening and care.
- **Support and Community Engagement:** Promote maternal health awareness and prenatal care access by engaging local healthcare professionals, community leaders, and women's organisations. Promote government, non-governmental, and community-based partnerships to help pregnant women and enhance maternal and newborn health.

- **Constant Monitoring and Evaluation:** Regular monitoring and evaluation of the PMSMA programme to track high-risk pregnancies and intervention efficacy. Keep screening criteria and treatment techniques current with maternal and neonatal health care evidence and best practices.
- **Research and Capacity Building:** Invest in research and capacity-building to help healthcare practitioners detect and manage high-risk pregnancies. Foster cooperation between academic institutions, government agencies, and healthcare facilities to develop and implement evidence-based treatments to reduce high-risk pregnancies and improve maternal and newborn health.

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Table 1: Sociodemographic factors, outcome of pregnancy among pregnant women registered in PMSMA program in the year 2021 (n=550)			
Sociodemographic factors, Obstetric and neonatal outcome		PW enrolled in PMSMA	%age
Education of pregnant women	High school and above	342	62%
	Below High school	208	38%
Age distribution of Pregnant women	15-19	29	5%
	20-24	361	66%
	25-29	133	24%
	30 & above	27	5%
Religion	Hinduism	483	88%
	Islam	67	12%
Type of Family	Joint Family	312	57%
	Nuclear Family	200	36%
	Three Generation Family	38	7%
Age at 1st Delivery	15-20	251	46%
	20-25	291	53%
	>25	8	1%
SES status	Above middle class	124	23%
	Middle class and below	426	77%
Type of Delivery	Preterm (<37 weeks)	50	9%
	Term (37-42 weeks)	439	81%
	Post-term (>42)	51	9%
Mode of Delivery	Spontaneous vaginal delivery	443	84%
	Lower segment caesarean section	43	8%
	Assisted vaginal delivery	43	8%
Birth weight of the child	Low (<2.5)	30	6%
	Normal (≥2.5)	499	94%
Status of birth	Live birth	529	96%
	Stillbirth/abortion	21	4%
Awareness Level	Awareness about other maternal health services	231	42%
	No awareness about other maternal health services	319	58%

Table 2: Association of Sociodemographic factors, outcome of pregnancy with high-risk status among pregnant women registered in PMSMA program in the year 2021 (n=550)					
Sociodemographic factors, Obstetric and neonatal outcome	Normal pregnancy	High Risk pregnancy	Chi Square	df	P value

				value		
Education of pregnant women	High school and above	263	79	52.397	1	<0.000 1
	Below High school	97	111			
Age distribution of Pregnant women	15-19	5	24	33.573	3	<0.000 1
	20-24	250	111			
	25-29	90	43			
	30 & above	15	12			
Religion	Hinduism	320	163	1.117	1	0.291
	Islam	40	27			
Type of Family	Joint Family	200	112	4.84	2	0.089
	Nuclear Family	140	60			
	Three Generation Family	20	18			
Age at 1st Delivery	15-20	135	116	28.398	2	<0.000 1
	20-25	220	71			
	>25	5	3			
SES status	Above middle class	80	44	0.062	1	0.803
	Middle class and below	280	146			
Type of Delivery	Preterm (<37 weeks)	14	36	46.437	2	<0.000 1
	Term (37-42 weeks)	316	123			
	Post term (>42)	30	31			
Mode of Delivery	Spontaneous vaginal delivery	320	133	32.52	2	<0.000 1
	Lower segment caesarean section	19	35			
	Assisted vaginal delivery	21	22			
Birth weight of the child	Low (<2.5)	11	19	10.386	1	<0.000 1
	Normal (≥2.5)	328	171			
Status of birth	Live birth	356	173	20.795	1	<0.000 1
	Stillbirth/abortion	4	17			
Awareness Level	Awareness about other maternal health services	200	31	78.608	1	<0.000 1
	No Awareness about other maternal health services	160	159			

Figure 1: Important Socio-Demographic Variables



