ORIGINAL ARTICLE

Burden and Socio-Demographic Determinants of High-Risk Pregnancy in Rural Ghaziabad: A Cross-Sectional Study

Ashutosh Subudhi, Deepika Agrawal, Syed Hasan Nawaz Zaidi, Gajendra Kumar Gupta
Department of Community Medicine, Santosh Medical College Ghaziabad, Uttar Pradesh

CORRESPONDING AUTHOR
Dr Ashutosh Subudhi,Post Graduate, Department of Community Medicine, Santosh Medical College Ghaziabad, Uttar Pradesh
Email: drashutooshsubudhi@gmail.com

CITATION
Subudhi A, Agrawal D, Zaidi SHN, Gupta GK. Burden and Socio-Demographic Determinants of High-Risk Pregnancy in Rural Ghaziabad: A Cross-Sectional Study. Indian J Comm Health. 2026;38(1):66-71.
https://doi.org/10.47203/IJCH.2026.v38i01.013

ARTICLE CYCLE
Received: 11/02/2026; Accepted: 27/02/2026; Published: 28/02/2026

ABSTRACT

Background: High-risk pregnancy (HRP) remains a major public health concern in rural India due to persistent socio-demographic and obstetric vulnerabilities. **Aim:** To estimate the burden of high-risk pregnancies among postpartum women in rural areas of Ghaziabad and to assess their association with socio-demographic determinants. **Methodology:** A cross-sectional study was conducted among 327 postpartum women residing in selected rural villages. Data were collected using a pre-designed, semi-structured questionnaire after obtaining informed consent. Information on socio-demographic profile and pregnancy-related risk factors was obtained through interviews. Data entry was done in MS Excel, and statistical analysis was performed using IBM SPSS version 31.0. Chi-square test was applied, and $p<0.05$ was considered significant. **Results:** Overall, 131 women (40%) were identified as high-risk. Severe anaemia was the most common risk factor (38.17%; n=50), followed by previous LSCS (34.35%; n=45). Significant associations were noted between high-risk pregnancy and age at marriage (p=0.009), religion (p=0.001),family type (p=0.043) and Gestational Age at Birth(0.001). **Conclusion:** The study reveals a considerable burden of high-risk pregnancies in rural Ghaziabad, with anaemia and previous LSCS being major contributors. Early marriage, religion, and family structure were important determinants. Strengthening antenatal care, promoting delayed marriage, improving nutrition, and enhancing community awareness are essential to reduce maternal and perinatal complications.

KEYWORDS

High-Risk Pregnancy, Risk Factors, Rural Health, Antenatal Care, Maternal Health.

INTRODUCTION

A high-risk pregnancy (HRP) is defined as one complicated by factors that may adversely affect maternal or perinatal outcomes. Although only 10–30% of pregnancies are classified as high-risk, they contribute to nearly 70–80% of maternal and perinatal morbidity and mortality. Common risk factors include severe anemia, hypertensive disorders, infections, hypothyroidism, gestational diabetes, multiple pregnancies, previous cesarean section, and extremes of maternal age.(1)

Globally, maternal mortality remains a major concern, with over 260,000 maternal deaths occurring annually, predominantly in developing countries and rural settings. The global maternal mortality ratio (MMR) in 2023 was 197, while India and Uttar Pradesh reported MMRs of 88 and 141, respectively. Neonatal mortality also remains high, with India reporting 24.9 per 1,000 live births and a substantial global burden.(2,3)

High-risk pregnancies are strongly associated with adverse perinatal outcomes, including stillbirths and preterm births. These challenges are further amplified in rural and resource-limited areas due to poor accessibility, lack of skilled care, and inadequate health infrastructure.(4)

Early identification and appropriate management of HRPs are essential to reduce maternal and neonatal morbidity and mortality. The present study was undertaken to assess the burden and socio-demographic determinants of high-risk pregnancy in rural Ghaziabad.(5)

AIM: To estimate the burden of high-risk pregnancies among postpartum women in rural areas of Ghaziabad and to assess their association with socio-demographic determinants.

MATERIAL & METHODS

Study type & Study design: This was an observational, community-based cross-sectional study conducted to assess the burden and associated factors of high-risk pregnancies.

Study setting: The study was carried out in the rural areas of district Ghaziabad and at the Department of

Community Medicine, Santosh Medical College, Ghaziabad.

Study population: The study population comprised postpartum women aged 15–45 years residing in selected rural areas of Ghaziabad.

Study duration: The study was conducted over a period of six months, from November 2024 to April 2025.

Sample size calculation: The sample size for the present study was calculated using Fisher's formula: $n = (Z^2 \times p \times (100 - p)) / d^2$. In this formula, Z was taken as 1.96 corresponding to a 95% confidence interval, p was taken as 30.7% based on the prevalence of high-risk pregnancies reported by Jaideep KC et al. (9), and d was considered as 5% absolute precision. Substituting these values, the calculated sample size was 326.7, which was rounded off to 327 participants for the study.

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

Exclusion criteria: Participants who were unavailable during the visit or who were not willing to participate or refused to provide written informed consent were excluded from the study.

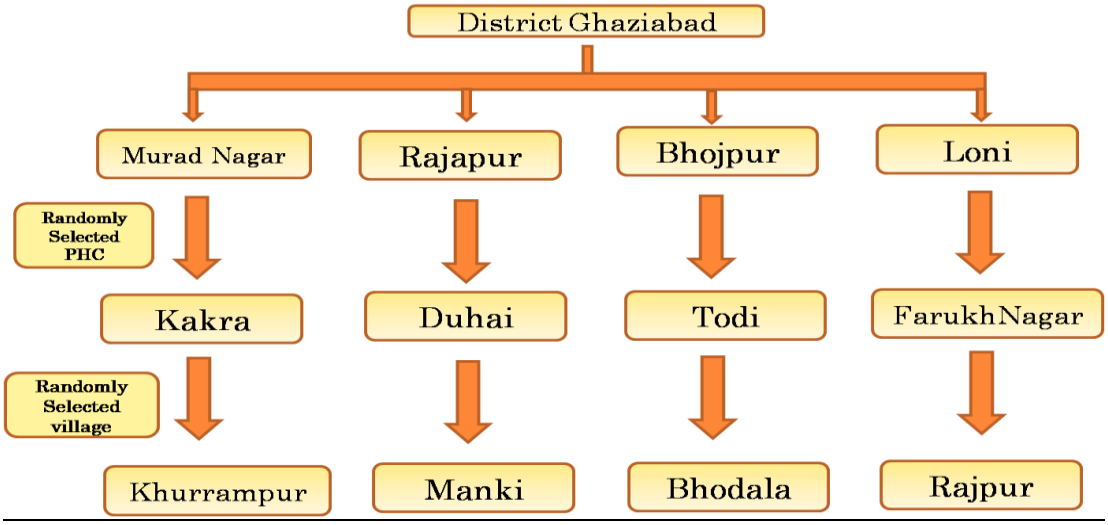
Strategy for data collection: A multi-stage random sampling technique was employed. One PHC from each rural block was selected randomly, followed by selection of one village from each PHC. All eligible postpartum women in the selected villages were included until the required sample size was achieved. Data were collected using a pre-designed, semi-structured questionnaire through face-to-face interviews. The list of participants was obtained from ASHA and ANM workers.

Working definition: High-risk pregnancy was defined as any pregnancy associated with one or more medical, obstetric, or socio-demographic risk factors that could adversely affect maternal or perinatal outcomes, as per the guidelines of the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), Government of India.

Ethical issues & Informed consent: Ethical approval was obtained from the Institutional Ethics Committee of Santosh Medical College. Written informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity of the participants were strictly maintained.

Data analysis: The data were collected and entered in MS Excel 2016. Analysis was performed using appropriate statistical methods with SPSS software version 31.0. The chi-square test was applied to assess associations between variables, and a p-value of <0.05 was considered statistically significant.

Flow diagram



RESULTS

Table 1: This table depicts the distribution of blocks.Equal number of participants were taken from 4 blocks of district Ghaziabad, that are Murad nagar, Rajapur, Loni and Bhojpur.

Table 1: Distribution of Blocks and number of participants.

S. No.	Blocks of Ghaziabad district	Number (n= 327)	Percentage (%)
1	Murad Nagar	82	25.07
2	Rajapur	82	25.07
3	Loni	82	25.07
4	Bhojpur	81	24.7
Total		327	100

Figure 1: Distribution of Study Participants by Age

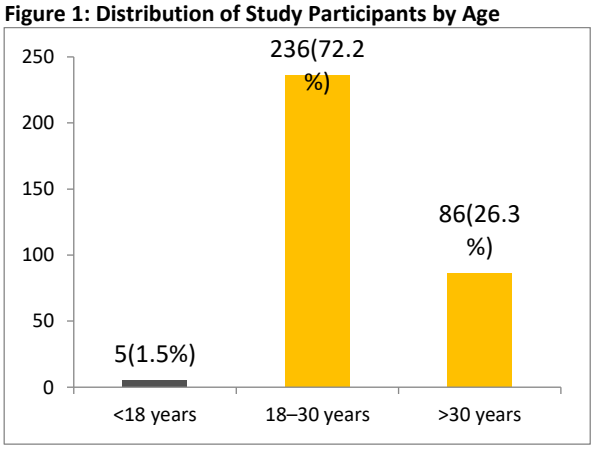


Figure 1 shows division of study participants by age (in Years). The majority of study participants belonged to the 18–30 years age group, accounting for 236 (72.2%) of the total study population, indicating that younger women constituted the predominant age group in the study.

Figure 2: Proportion of High-Risk Pregnancies among the Study Participants.

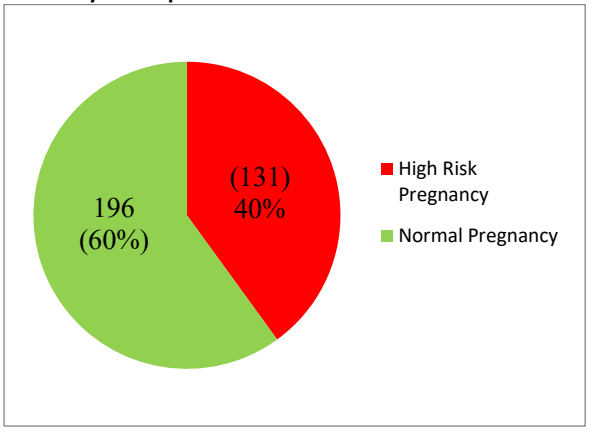


Figure 2 shows the distribution of study participants in accordance with tohigh-risk pregnancy status. Among the study participants, 131 (40%) were identified as high-risk pregnancies, while 196 (60%) were normal pregnancies, indicating that a substantial proportion of pregnancies were categorized as high risk.

Table 2 shows the distribution of high-risk pregnancy according to selected risk factors. Among the high-risk pregnancies, severe anemia (<7 g/dl) was the most common risk factor, present in 50 (38.17%) participants, followed by previous LSCS in 45 (34.35%) participants.Multiple risk factors co-existed in several women; therefore, the total number exceeds the sample size.

Table 3 shows the association between sociodemographic factors and high-risk pregnancy. The proportion of high-risk pregnancy was highest among women aged less than 18 years (80%), followed by those aged above 30 years (43%) and 18–30 years (37.7%), but the association was not statistically significant (p=0.124). High-risk pregnancy was more common among women married before 18 years (61.8%) compared to those married between 18–30 years (37.6%), and this association was statistically significant (p=0.009). A higher proportion of high-risk pregnancy was observed among Muslim women (51.1%) compared to Hindu women (32%), which was statistically significant (p=0.001). High-risk pregnancy was also more common in nuclear families (45.2%) than in joint families (34.8%), and this association was statistically significant (p=0.043). Although higher proportions of high-risk pregnancy were observed among women from lower socioeconomic classes, the association was not statistically significant (p=0.074).

Table 2: Distribution of Study Participants According to Risk factors for High-Risk Pregnancy.

S. No.	Risk Factors	Number (n= 131)	Percentage (%)
1	Severe anemia (<7 g/dl)	50	38.17
2	Pregnancy induced Hypertensive disorder	5	3.82
3	Gestational diabetes mellitus	8	6.11
4	Hypothyroidism	7	5.34
5	HIV	0	0.00
6	Syphilis	0	0.00
7	Young primi (Age <19)	7	5.34
8	Elderly primi (Age >35)	1	0.76
9	Twin /multiple pregnancy	3	2.29
10	Rh negative Blood group	3	2.29
11	Previous LSCS	45	34.35
12	History of still birth	10	7.63
13	TB	1	0.76
14	Malaria	1	0.76
15	Grand Multipara	3	2.29
16	Cephalo- Pelvic Disproportion	0	0.00
17	Hepatitis-B	8	6.11
18	Congenital malformation	0	0.00
19	Systemic illness	2	1.53
20	Prolonged labour/ Obstructed labour	2	1.53

** Several women had more than one risk factor.*

Table 3: Association Between Sociodemographic Factors &High-Risk Pregnancy.

	High Risk Pregnancy			X^2-value, d.f., P- Value
Age	**Yes**	**No**	**Total**	
< 18	4 (80%)	1 (20%)	5(100%)	4.176,2,0.124
18-30	89 (37.7%)	147 (62.3%)	236 (100%)	
> 30	37 (43%)	49 (57%)	86 (100%)	
Age of Mother at Marriage				
< 18	21 (61.8%)	13 (38.2%)	34 (100%)	**9.426,2,0.009**
18-30	109 (37.6%)	181 (62.4%)	290 (100%)	

> 30	0	3 (100%)	3 (100%)	
Religion				
Hindu	62 (32%)	132 (68 %)	194 (100%)	**11.319,1,0.001**
Muslim	68 (51.1%)	65 (48.9%)	133 (100%)	
Type of Family				
Nuclear	75 (46.2%)	91 (54.8%)	166 (100%)	**6.308,2,0.043**
Joint	56 (34.8%)	105 (65.2%)	161 (100%)	
Socio-Economic Class				
Upper	0	3 (100%)	3 (100%)	8.533,4,0.074
UpperMiddle	18 (31.6%)	39 (68.4%)	57 (100%)	
Middle	64 (38.6%)	102 (61.4%)	166 (100%)	
LowerMiddle	44 (45.8%)	52 (54.2%)	96 (100%)	
Lower	4 (80%)	1 (20%)	5 (100%)	

Table 4: Association Between Pregnancy Outcomes & High-Risk Pregnancy.

	High Risk Pregnancy			X^2**-value, d.f., P- Value**
Outcome of Pregnancy	**Yes**	**No**	**Total**	
Live birth	125(39.2%)	195(60.8%)	319(100%)	1.771,1,0.183
Still birth	5(62.5%)	3(37.5%)	(100%)	
Gestational Age at Birth				
Preterm	28(70%)	12(30%)	40(100%)	**17.936,2,0.0001**
Term	102(35.7%)	184(64.3%)	286(100%)	
Post term	0	1(100%)	1(100%)	
Birth Weight				
Low birth wight	14(42.4%)	19(57.6%)	33(100%)	0.640,2,0.726
Normal	107(38.9%)	168(61.1%)	275(100%)	
Fetal macrosomia	9(47.4%)	10(52.6%)	19(100%)	

Table 4 shows the association between pregnancy outcomes and high-risk pregnancy. Among live births, 39.2% belonged to the high-risk group and 60.8% to the non–high-risk group, with no statistically significant association (p=0.183). Preterm births were more common in the high-risk group (70%) compared to the non–high-risk group (30%), and this association was statistically significant (p=0.0001). With respect to birth weight, the distribution of low birth weight, normal weight, and macrosomia did not show a statistically significant association with high-risk pregnancy (p=0.726).

DISCUSSION

The majority of participants belonged to the age group of 18–30 years constituting 236 (72.2%) of the study population followed by women aged more than 30 years who accounted for 86 (26.3%). Adolescents aged less than 18 years formed a very small proportion at 5 (1.5%). Similar findings were reported by Kumar et al. (6) in a study carried out in Ghaziabad, Uttar Pradesh, where 358 (82.68%) women were in the 20-30 years age group, followed by 68 (15.71%) who were older than 30 years, while only 7 (1.61%) participants were below 20 years of age. Mogan et al. (7) 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. This age distribution is comparable with the findings of KCJ et al. (8) from Belgavi, Karnataka, who reported that the majority of pregnant women (88%) were in the age group of 20-29 years, with 7% being adolescents and 5% aged more than 30 years, indicating a similar reproductive age pattern in rural settings. The age distribution is consistent with previous studies, all of which show that the reproductive age group of 20-30 years constitutes the predominant proportion of antenatal women in this region. However, efforts should be directed to sensitize women about ideal age of conception since 5 women were found to be in less than 18 years of age in our study. (Figure 1).

Among all the pregnancies, 131 (40.0%) women were identified as having High risk pregnancies, while 196 (60.0%) were categorized as having normal pregnancies.Similarly Jaideep KC et al. (9) conducted at Belgavi, Karnataka reported that 184 (30.66%) women had High risk pregnancies, whereas 416 (69.33%) were classified as non-High risk pregnancies. Similarly, a study by Jadhao et al. (10) at rural areas of Nagpur, Maharashtra noted a prevalence of High risk pregnancy of 33.64% in their study population. The proportion of high risk pregnancies in the study is similar to findings from Ibrahim et al., Jaideep KC et al. and Jadhao et al., all showing comparable levels of High risk cases, reflecting a consistent burden across rural settings, across the country and across 2 decades despite putting a lot of efforts by the health ministry in maternal and child health services. (Figure 2)

Several maternal risk factors were identified among the 131 high risk pregnant women and multiple participants had more than one risk factor. Severe anaemia (<7 g/dl) was the most common risk factor (38.17%) followed by Previous LSCS (34.35%), Gestational diabetes mellitus(6.11%) and hepatitis-B infection(6.11%), while pregnancy-induced hypertension was observed in (3.82%) women.In contrast a study by Mogan KA et al. (2023)(7) in a PHC at Fatehpur Beri, Delhi observed hypothyroidism as the most common risk factor,

reported in 119 (43.7%) women, followed by >1 previous LSCS in 52 (19.1%) and more than one abortion in 43 (15.8%). Multigravida status (>5) was reported in 21 (7.7%) women, previous stillbirth in 10 (3.6%), Rh incompatibility in 9 (3.3%) and severe anaemia in 4 (1.4%) women. Similarly, Bhandari et al. (2024)(11) conducted a study in tertiary care hospital among high risk pregnant females reported that among 91 (26.0%) high risk pregnant women, previous LSCS was the most common risk factor in 25 (27.47%), followed by hypothyroidism in 19 (20.87%) and GDM in 15 (16.48%). The overall pattern of maternal risk factors is broadly similar across studies, with severe anaemia and previous LSCS being the most common in the study, aligning with the predominance of major obstetric risk factors reported in other studies. (Table 2)

Age was not significantly associated with pregnancy risk status.Ibrahim et al. (12) conducted at Salem, Tamil Nadu also reported a non-significant association between Mandal et al. (13) conducted a study in Malda, West Bengal and did not observed any statistically significant relationship between maternal age and pregnancy risk, reporting a chi-square value of 3.9428 with a p-value of 0.13926. The consistent findings across studies indicate that maternal age alone did not significantly influence pregnancy risk status. (Table 3)

Age at marriage proved to be statistically significant association with pregnancy risk status. Higher proportion of high-risk pregnancies was observed among women married before 18 years of age. Kiplagat et al. (14) did a study at Mysore, Karnataka also reported a statistically significant association between age at marriage & adverse pregnancy outcomes, with a p-value < 0.0001, supporting the findings of the study. The consistent statistical significance across studies indicates that early age at marriage is an important determinant contributing to a higher likelihood of High-risk pregnancy in these settings. (Table 3)

Religion showed a statistically significant association with pregnancy risk status. High risk pregnancy was more common among Muslim women, with 68 out of 133 (51.1%) classified as high risk, compared to 62 out of 194 (32.0%) among Hindu women. This difference proved to be statistically significant (χ^2 = 11.319, df = 1, p = 0.001. Suchita et al. (15) conducted a study at Ujjain, Madhya Pradesh also noted a significant association between religion and pregnancy risk, noting that 126 (78.3%) of Hindu women in the High risk category, while among non-Hindu women, 35 (21.7%) were high risk, with their reported p-value of 0.03 confirming statistical significance. The consistent statistical significance across studies indicates that religion may act as an important determinant influencing the likelihood of High-risk pregnancy in these settings. (Table 3)

Family type showed a statistically significant association with pregnancy risk status. High-risk pregnancy was more common among women belonging to nuclear families, with 75 out of 166 (45.2%) classified as high-risk.This association was statistically significant (χ^2 = 6.308, df = 2, p = 0.043). Suchita et al. (15) conducted a study at Ujjain, Madhya Pradesh also assessed the association between family type and pregnancy risk and found that among women from joint families, 161 (67.4%) were low risk and 121 (75.2%) were high risk however, this association was not statistically significant (p = 0.09). The differing significance across studies suggests that family type may influence pregnancy risk in some settings, but it may not consistently act as a strong independent predictor of High-risk pregnancy. (Table 3)

No statistically significant association was observed between socio-economic status and pregnancy risk. High risk pregnancy was proportionately highest among women belonging to the lower socio-economic class, with 4 out of 5 (80%) classified as high risk, followed by lower-middle class women with 44 out of 96 (45.8).The association was not statistically significant (χ^2 = 8.533, df = 4, p = 0.074). Sahoo et al. (16) conducted a study at NewDelhi also reported a significant association between socio-economic status and pregnancy risk, where 21 (77.8%) women from the lower class were low risk and 6 (22.2%) were high risk, while in the middle/upper-middle class, 29 (22.0%) were low risk and 103 (78.0%) were high risk; their findings were statistically significant (χ^2 = 35.309, p < 0.001). The inconsistency in statistical significance across studies suggests that socio-economic status may not be a strong or consistent independent predictor of High-risk pregnancy, possibly because its influence varies with differences in local healthcare access and support systems. (Table 3)

In the present study, among live births, 39.2% belonged to the high-risk group and 60.8% to the non–high-risk group, and this association was not statistically significant (p = 0.183). Priya et al. (2021)(17) at a tertiary health centre in Hyderabad,Telangana, India reported that live births constituted 71% in the high-risk group and stillbirths accounted for 8% in the same group, with the overall association being statistically significant (p = 0.008). Further, preterm births were more common in the high-risk group (70%) compared to the non–high-risk group (30%), and this association was found to be statistically significant (p = 0.0001). Similar findings were reported by Priya et al. (2021)(17) at Hyderabad, Telangana, who observed that preterm delivery was significantly higher among high-risk pregnancies (35%) compared to normal pregnancies (11%) (p = 0.004). In our study, the distribution of low birth weight, normal birth weight, and macrosomia did not show a statistically significant association with high-risk pregnancy (p = 0.726). Comparable findings were reported by Priya et al. (2021)(17) at a tertiary health centre in Hyderabad, Telangana, India, where the overall association between gestational age at delivery and high-risk pregnancy was not statistically significant (p = 0.05).(Table 4)

CONCLUSION

The study shows a high burden of high-risk pregnancies in rural Ghaziabad, with 40% of women classified as high risk. Severe anaemia and previous caesarean section were the most common risk factors, reflecting persistent gaps in nutrition, spacing, and maternal care. Socio-demographic factors such as early marriage, religion, and family type were significantly associated with HRP. Strengthening antenatal care, promoting delayed

marriage and adequate birth spacing, and improving community-based awareness and referral pathways are essential to reduce maternal and neonatal complications. PMSMA scheme has been introduced by the Ministry of Health and Family Welfare, Government of India in the year 2016 and its performance in improving high risk pregnancy outcomes shall be assessed.

RECOMMENDATION

Strengthening antenatal care services for early detection and management of high-risk pregnancies at the community level is essential. Improving maternal nutrition, promoting early registration of pregnancy, adequate birth spacing and delaying age at marriage are key public health measures. Capacity building of frontline health workers and strengthening referral systems are necessary to ensure timely care and reduce maternal and perinatal morbidity and mortality.

RELEVANCE OF THE STUDY

The present study provides recent, community-based evidence on the burden and determinants of high-risk pregnancies in rural Ghaziabad. It highlights the significant role of modifiable socio-demographic factors such as age at marriage, religion and family type in influencing pregnancy risk. The findings add to existing literature by offering localized data that can support targeted interventions, policy planning and strengthening of maternal health services in similar rural settings.

AUTHORS CONTRIBUTION

All authors have contributed equally.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil

CONFLICT OF INTEREST

There are no conflicts of interest.

ACKNOWLEDGEMENT

Authors are thankful to Editor & Chief and editorial board of this journal.

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.

REFERENCES

1. Sharma JB, Hinal P, Gautam A. Navigating the challenges of high-risk pregnancy: a case study of female genital tuberculosis and obstetric complications. Gynecol Obstet Open Access. 2025;9:232. doi:10.29011/2577-2236.100232
2. United Nations Children's Fund (UNICEF). Neonatal mortality [Internet]. New York: UNICEF Data; 2025 Mar [accessed on 15/03/26]. Available from: https://data.unicef.org/topic/child-survival/neonatal-mortality/
3. International Institute for Population Sciences (IIPS), Ministry of Health and Family Welfare, Government of India, ICF. National Family Health Survey (NFHS-5), 2019–21 India [Internet]. Mumbai: IIPS; 2021 [accessed on 24/03/26]. Available from: https://rchiips.org/nfhs/NFHS-5Reports/India.pdf
4. World Health Organization. Every newborn: an action plan to end preventable deaths [Internet]. Geneva: World Health Organization; 2014 [accessed on 24/03/26]. Available from: https://www.who.int/publications/i/item/9789241507448
5. Ministry of Health and Family Welfare, Government of India. Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) operational guidelines [Internet]. New Delhi: MoHFW; 2016 [accessed on 24/03/26]. Available from: https://pmsma.mohfw.gov.in/
6. Gunjan K, Agarwal D, Srivastava S, Gupta GK. Study of utilization of maternal and child health services in rural area of district Ghaziabad. 2023. doi: (not available)
7. Ka M, Venkatesh U, Kapoor R. Clinico-epidemiological profile of women with high-risk pregnancy utilizing antenatal services in a rural primary health center in India. J Rural Med. 2023;18(1):15–20. doi:10.2185/jrm.2022-018
8. Chate S, Metgud C. Pregnancy outcome among high-risk pregnant women in the rural area of Belagavi. J Family Med Prim Care. 2022;11(8):4440. doi:10.4103/jfmpc.jfmpc_10_22
9. Bhandari S, Dwa Y, Maharjan M, Bajracharya M. High risk pregnancy and its outcome in a tertiary care hospital: a descriptive cross-sectional study. J Nepal Med Assoc. 2024;62(273):306–310. doi:10.31729/jnma.8561
10. KC J, D P, A G. Prevalence of high risk among pregnant women attending antenatal clinic in rural field practice area of Jawaharlal Nehru Medical College, Belagavi, Karnataka, India. Int J Community Med Public Health. 2017;4(4):1257. doi:10.18203/2394-6040.ijcmph20171359
11. Jadhao AR, Gawade MD, Ughade SN. Outcome of pregnancy among high risk pregnancies in rural area of Nagpur, central India. Int J Community Med Public Health. 2017;4(3):628. doi:10.18203/2394-6040.ijcmph20170443
12. Ibrahim RM, Priyadarsini S, Nayeem RA, et al. A cross-sectional study on the prevalence and clinico-social profile of high risk pregnancies in rural Tamil Nadu, India. J Clin Diagn Res. 2022. doi:10.7860/jcdr/2022/55133.16106
13. Mandal P, Mandal J. Pregnancy outcome study between Pradhan Mantri Surakshit Matritva Abhiyan service utilization group and non-utilization group: a comparative study. Int J Reprod Contracept Obstet Gynecol. 2021;10(7):2651. doi:10.18203/2320-1770.ijrcog20212645
14. Kiplagat S, Ravi K, Sheehan DM, et al. Sociodemographic patterns of preterm birth and low birth weight among pregnant women in rural Mysore district, India: a latent class analysis. J Biosoc Sci. 2023;55(2):260–274. doi:10.1017/S0021932022000037
15. Singh S, Deshpande K, Chouhan DS, Badkur D. A hospital-based study on complications of childbirth and associated risk factors at Ujjain, Madhya Pradesh. 2017;8(2). doi: (not available)
16. Sahoo J, Singh SV, Gupta VK, et al. Do socio-demographic factors still predict the choice of place of delivery: a cross-sectional study in rural North India. J Epidemiol Glob Health. 2015;5(S1):S27. doi:10.1016/j.jegh.2015.05.002
17. Priya R, Sultana SR. A longitudinal study on high risk pregnancy and its outcome among antenatal women attending a tertiary health centre. Int J Clin Obstet Gynaecol. 2021;5(5):16–21. doi:10.33545/gynae.2021.v5.i5a.1008