

PREVALENCE AND RISK FACTORS OF MATERNAL NEAR MISS CASES IN A TERTIARY CARE TEACHING HOSPITAL AND COLLEGE: UTTARAKHAND, INDIA

Himani Palariya¹, Nafis Fatima², Chitra Joshi³

¹Post Graduate Resident, Government Doon Medical College, Dehradun, India.

²Assistant Professor, Government Doon Medical College, Dehradun, India.

³Professor, Government Doon Medical College, Dehradun, India.

Received : 10/07/2025
Received in revised form : 01/09/2025
Accepted : 18/09/2025

Keywords: maternal near miss, WHO, maternal mortality ratio

Corresponding Author:
Dr. Nafis Fatima,
Email: nafisfatima2@gmail.com

DOI: 10.47009/jamp.2025.7.5.207

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (5); 1097-1101



ABSTRACT

Background: Pregnancy related morbidity and mortality continue to have a huge impact on the lives of Indian women and their new born. Maternal mortality is an important indicator of maternal health in any society. However, maternal mortality is just “the tip of the iceberg”, with maternal morbidity forming the base of the said iceberg. For every maternal death, there are several women who experienced a severe complication, nearly died but survived.^[6] Maternal Near Miss (MNM) is a concept introduced in 2009, by WHO, and is defined as an event in which “A woman who survives life threatening conditions during pregnancy, abortion, and childbirth or within 42 days of pregnancy termination irrespective of receiving emergency medical /surgical interventions, is called Maternal Near Miss”.^[1] The study of MNM is a much better tool than maternal mortality as the insights rendered are immense. **Materials and Methods:** **Study type:** This cross-sectional observational study was conducted at Doon Government Medical College and Associated Hospital, Dehradun, India, a tertiary care referral center. **Study period:** 18 months. **Sample size:** All near-miss cases, as defined by the Ministry of Health and Family Welfare, were included in this study. **Result:** There were 13,415 deliveries and 23 maternal mortality and 320 cases of MNM. In our study, the majority of the cases (49.7%) were in the age group of 26-30 years. In present study 39.68% of near miss cases belonged to the lower socioeconomic class, while 5.6% were upper middle class. Majority of the patient were multipara. Unbooked cases (53%) and referred cases (67%) played major contribution in MNM cases. **Conclusion:** All the risk factors of MNM cases are often interconnected and addressing them will require a multifaceted approach that includes improvements in healthcare access, education, and socioeconomic empowerment. By studying MNM cases, healthcare professionals can gain a deeper understanding of the causes, consequences, and management of severe maternal complications. This knowledge can inform strategies to reduce maternal mortality and improve maternal healthcare outcomes.

INTRODUCTION

Pregnancy-related morbidity and mortality continue to have a significant impact on the lives of Indian women and their newborns. According to the World Health Organization, “Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.”^[1]

Maternal mortality ratio (MMR) is the most sensitive indicator for social inequalities. Maternal mortality ratio (MMR) is defined as the number of maternal deaths that occurs during a specific time period per 100,000 live births during the sametimeperiod.^[2] As per the latest report of the Registrar General of India, the Maternal Mortality Ratio (MMR) of India has declined from 103 in 2017–2019 to 97 per 100,000 live births in 2018–2020.^[3]

In recent decades, India has been engaged in continuous efforts to improve maternal health and reduce maternal mortality. The National Health

Policy (NHP) 2017 had given the target of achieving MMR less than 100/lakh live births by 2020. Through the endless and constant efforts of the Government, India has successfully achieved the target Maternal Mortality Ratio (MMR) of 97 per lakh live births in 2018–2020. As per the statistics by Sample Registration System, India has progressive decline in MMR from 2014-16 to 2018-20.^[4]

The Sustainable Development Goals (SDGs) have set a target of reducing the Maternal Mortality Ratio (MMR) to less than 70 per lakh live births by 2030. At present, India is steadily progressing towards achieving this SDG target. Several states in India have already met the goal, with Kerala (19) leading the list, followed by Maharashtra (33), Telangana (43), Andhra Pradesh (45), Tamil Nadu (54), Jharkhand (56), Gujarat (57), and Karnataka (69). The current MMR reported in the state of Uttarakhand is 103 per one lakh live births.^[5]

Though maternal mortality is an important indicator of maternal health in any society, it represents only “the tip of the iceberg,” with maternal morbidity forming the much larger base beneath it. For every maternal death, there are several women who experience severe complications, nearly die, but ultimately survive.^[6]

The concept of Maternal Near Miss (MNM) was introduced by the World Health Organization (WHO) in 2009. It is defined as an event in which “a woman who survives life-threatening conditions during pregnancy, abortion, childbirth, or within 42 days of termination of pregnancy, irrespective of receiving emergency medical or surgical interventions, is called a Maternal Near Miss.”^[1] The study of Maternal Near Miss (MNM) is a far more effective tool than maternal mortality, as it provides invaluable insights. This is owing to the fact that the women are alive to provide detailed information related to the events, and healthcare workers are more motivated to discuss the successful interventions that saved lives. Most importantly, the incidence of Maternal Near Miss (MNM) cases is considerably higher than that of maternal deaths.^[7,8]

However, unlike maternal deaths, it is very difficult to define Maternal Near Miss (MNM) cases. Various criteria are available for identifying MNM cases, the most commonly used being the WHO Near Miss Approach^[1] and Mantel’s Criteria^[9]. In 2014, the Ministry of Health and Family Welfare

(MOHFW), Government of India, proposed operational guidelines to define and report MNM cases. However, only a few studies are available based on these guidelines.^[10]

The present study is being conducted at the Government Doon Medical College and Associated Hospital, Dehradun, with an aim, to study the prevalence of MNM and its causes by following the MOHFW criteria.

MATERIALS AND METHODS

Study Design and Setting

This cross-sectional observational study was conducted at Doon Government Medical College and Associated Hospital, Dehradun, India, a tertiary care referral center, from July 2022 to December 2023.

Ethics Approval

The study received approval from the Institutional Ethics Committee prior to commencement.

Study Population

The study population comprised all antenatal and postnatal patients who experienced severe maternal outcomes or near-miss events. These patients were admitted to the labor room, High-Dependency Unit (HDU), or Intensive Care Unit (ICU) during the study period.

Inclusion Criteria

Near-miss cases, as defined by the Ministry of Health and Family Welfare (MOHFW), were included in the study. These cases were managed either conservatively or surgically.

Exclusion Criteria

Women who developed near-miss conditions unrelated to pregnancy, i.e., not occurring during pregnancy or within 42 days after termination of pregnancy, were excluded

Data Collection

Data were collected on patient characteristics, including:

- Maternal age
- Socioeconomic status
- Gestational age
- Parity
- Mode of delivery
- Referral status
- Booking status
- Duration of HDU/ICU stay

RESULTS

Table 1: Maternal Near Miss Indicators

Indicators	Indices
Total number of admissions	16,355
Total number of deliveries	13,415
Total number of live births	12,637
Maternal Near Miss (MNM)	320
Maternal Death (MD)	23
Maternal Mortality Ratio (MMR)	182 per 100,000 LB
Women with Life-Threatening Condition (WLTC)	343

Severe Maternal Outcome Ratio (SMOR)	0.027
Maternal Near Miss Ratio (MNMNR)	2.53 per 1,000 LB
Maternal Near Miss to Mortality Ratio	13.9: 1
Mortality Index (MI)	6.70%

Table 2: Age Distribution of Near-Miss Cases

Age (years)	Near-Miss Cases (n = 320)	Percentage (%)
<20	10	3.1
21–25	128	40
26–30	159	49.7
31–35	20	6.3
36–40	3	0.9

Table 3: Socioeconomic Status (Kuppuswami Classification)

Socioeconomic Status	Near-Miss Cases (n = 320)	Percentage (%)
Lower	127	39.68
Lower Middle	99	30.93
Middle	76	23.75
Upper Middle	18	5.63

Table 4: Gestational Age of Near-Miss Cases

Variables	Near-Miss (n = 320)	Percentage (%)
Antenatal (n = 303)		
Early pregnancy	73	22.8
Preterm gestation	103	32.18
Term gestation	127	39.68
Postnatal (n = 17)	17	5.3
Total	320	100

Table 5: Mode of Delivery in Antenatal Near-Miss Cases

Mode of Delivery	Total ANC Cases (n = 303)	Percentage (%)
Forceps	1	0.33
Caesarean	139	45.87
Vaginal Delivery	83	27.39
Abortion	48	15.84
Ectopic	24	7.92
Molar Pregnancy	1	0.33
Laparotomy followed by Uterine Repair	7	2.31
Total	303	100

Table 6: Duration of Hospital Stay in Near-Miss Cases

Duration of Hospital Stay	Near-Miss Cases (n = 320)	Percentage (%)
≤5 days	194	60.63
6–10 days	124	38.75
>10 days	2	0.63
Total	320	100

Table 7: Duration of ICU Stay in Near-Miss Cases

Duration of ICU Stay	Near-Miss Cases (n = 86)	Percentage (%)
≤2 days	63	73.25
3–5 days	22	25.58
>5 days	1	1.16
Total	86	100

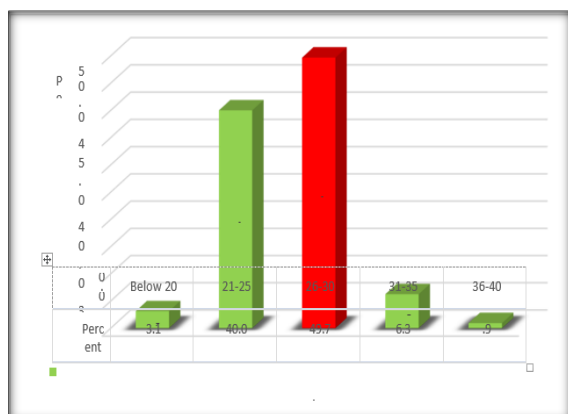


Figure 1: Age Distribution of Maternal Near-Miss Cases (n = 320)

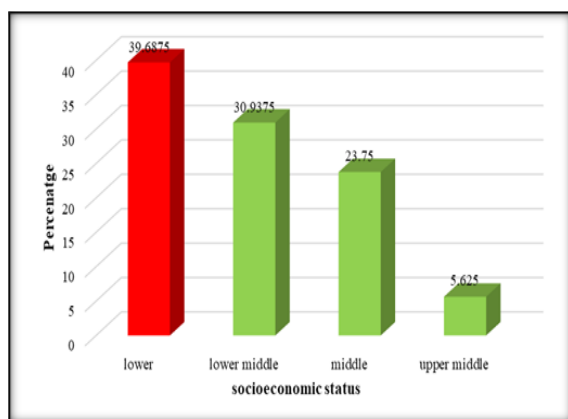


Figure 2: Distribution of Individuals by Socioeconomic Status

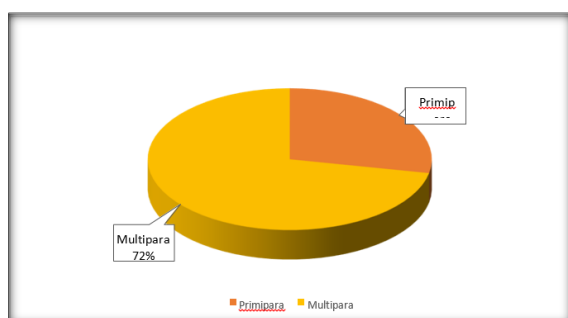


Figure 3: Distribution of Participants by Parity Status

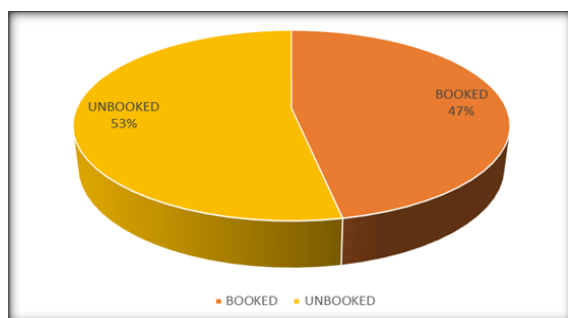


Figure 4: Booking Status of Participants

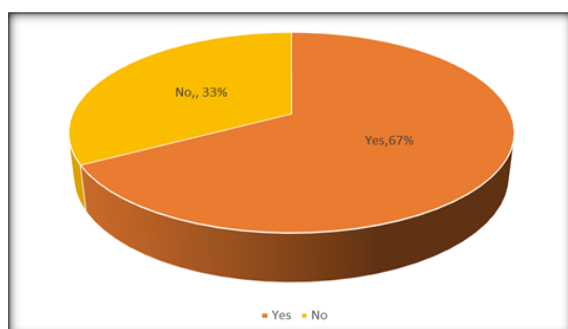


Figure 5: Distribution of Responses to the Question

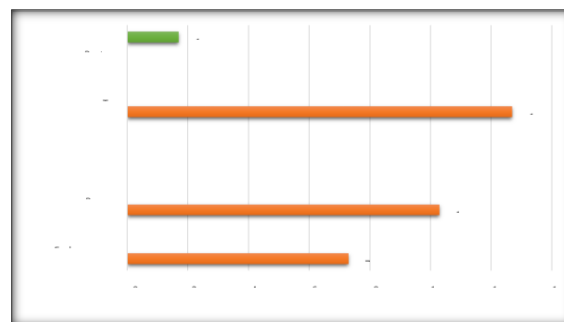


Figure 6: Distribution of Responses to Different Factors

DISCUSSION

The present study was conducted at Government Doon Medical College and Associated Hospital for a period of 18 months. During this duration there were 13,415 deliveries and 23 maternal mortality and 320 cases of MNM. The maternal near miss (MNM) cases identified in our study underscore the precarious nature of pregnancy and childbirth, highlighting the need for vigilant care and timely interventions.

In our study, the majority of cases, i.e., 49.7%, were in the age group of 26–30 years, followed by 40% in the 21–25 years age group. These results were similar to the study conducted by Sanju Kumari et al. [7], which reported 37.3% of cases in the 21–25 years age group and 44.6% in the 26–30 years age group. In our study, the majority of patients, 71.87% (230 cases), had more than one previous delivery, while 28.12% (90 cases) were primipara. This finding aligns with the study by Bansal et al. [12], which reported 64.10% of patients as multipara, indicating a proportional relationship between parity and the occurrence of maternal near-miss (MNM) events. In the present study, 39.68% (127 cases) of near-miss cases belonged to the lower socioeconomic class, followed by 30.93% from the lower-middle class, 23.75% from the middle class, and 5.6% from the upper-middle class. These findings were comparable to the study conducted by Sanju Kumari et al. [7], which reported 70.9% of near-miss cases in the lower socioeconomic class. These results reflect that patients belonging to the lower socioeconomic class, due to limited and delayed access to medical services and other social constraints, may be more prone to increased morbidity and MNM events. The unbooked status (53%) emerged as a significant variable in our study and is comparable to the findings of Sanju Kumari et al. [7] and Rathod et al. [13]. Referral status is also an important factor to consider when studying maternal health outcomes, as it may reflect delays in care and the overall healthcare infrastructure in peripheral areas.

In the present study, 67% cases were found to be referred. These findings are in accordance with the study conducted by Sanju Kumari et al. [7] which reported referral cases to be 71.4%.

In our study, 94.6% (303 cases) were antenatal, while 5.3% (17 out of 320 cases) were postnatal at the time of admission. Among the antenatal cases, 39.68% were at term gestation, 32.1% were preterm, and 22.8% were in early pregnancy. These findings are consistent with previous studies, which also reported a higher proportion of antenatal cases. In the current study, 43.43% of maternal near-miss cases underwent caesarean section, while 25.31% had vaginal delivery. Additionally, 2.18% of cases experienced uterine rupture requiring laparotomy and uterine repair. The caesarean section rate of 43.43% in our study aligns with the findings of Kaur et al. [14], who reported a 46.9% LSCS rate, and is comparable to Umadevi S et al. [11], who reported a LSCS rate of 57.95%. However, our results differ from those of Gupta et al [15], which reported a higher vaginal delivery rate (63.5%) and a lower LSCS rate (24.3%).

CONCLUSION

The key variables found to be significantly associated with maternal near-miss (MNM) are primarily sociodemographic, including age, parity, booking status, referral status, and socioeconomic status. While most of these factors cannot be directly modified, the preventable ones, such as age and parity, can be addressed through targeted interventions. These risk factors are often interrelated, and mitigating them requires a multifaceted approach encompassing improvements in healthcare access, education, and socioeconomic empowerment.

REFERENCES

1. World Health Organization. Evaluating the quality of care for severe pregnancy complications: The WHO near-miss approach for maternal health. Geneva: World Health Organization; 2011.
2. UNICEF. Maternal mortality. [Internet]. Available from: <https://data.unicef.org/topic/maternal-health/maternal-mortality/>
3. Office of the Registrar General & Census Commissioner, India. Sample Registration System – Maternal Mortality Bulletin. [Internet]. Available from: <https://censusindia.gov.in/census.website/data/SRSMMB>
4. Press Information Bureau. Significant Decline in the Maternal Mortality Ratio from 130 in 2014-16 to 97 in 2018-20. [Internet]. Available from: <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1879912#:~:text=Significant%20Decline%20in%20the%20Maternal%20Mortality%20Ratio%20from%20130%20in,live%20births%20in%202018%20D20>
5. Balsarkar G. Mothers shouldn't die: Significant decline in maternal mortality in India. *J Obstet Gynecol India*. 2023;73:99–101. doi:10.1007/s13224-023-01754-y
6. Purandare CN. Maternal Near Miss Review: A Way Forward. *J Obstet Gynaecol India*. 2013;63(4):213–215.
7. Kumari S, Kapoor G, Sharma M, Bajaj B, Dewan R, Nath B. Study of maternal near miss and maternal mortality in a tertiary care hospital. *J Clin Diagn Res*. 2020;14:10–13634. doi:10.7860/JCDR/2020/42710.13634
8. Tallapureddy S, Velagaleti R, Palutla H, Satti CV. "Near-miss" obstetric events and maternal mortality in a tertiary care hospital. *Indian J Public Health*. 2017;61:305–308.
9. Mantel GD, Buchmann E, Rees H, Pattinson RC. Severe acute maternal morbidity: a pilot study of a definition for a near-miss. *Br J Obstet Gynaecol*. 1998;105(9):985–990. doi:10.1111/j.1471-0528.1998.tb10262.x
10. Maternal Near Miss Review Operational Guidelines. Maternal Health Division, Ministry of Health & Family Welfare, Government of India; 2014. Available from: http://www.nrhmorissa.gov.in/writereaddata/Upload/Documents/Maternal_Near_Miss_Operational_Guidelines.pdf
11. Umadevi S, Ayesha S, Radha S, Nair ATS, Sulochana KD. Burden and causes of maternal mortality and near-miss in a tertiary care centre of Kerala, India. *Int J Reprod Contracept Obstet Gynecol*. 2017;6:807–813.
12. Bansal M, Lagoo J, Pujari K. Study of near-miss cases in obstetrics and maternal mortality in Bastar, Chhattisgarh, India. *Int J Reprod Contracept Obstet Gynecol*. 2016;5:620–623.
13. Rathod AD, Chavan RP, Bhagat V, Pajai S, Padmawar A, Thool P. Analysis of near-miss and maternal mortality at tertiary referral centre of rural India. *J Obstet Gynaecol India*. 2016;66:295–300. doi:10.1007/s13224-016-0902-2
14. Kaur L, Mohi MK, Kaur B, Singh B. A study of maternal near-miss cases in a tertiary health centre in north India. *Int J Reprod Contracept Obstet Gynecol*. 2018;7:3239–3243.
15. Gupta D, Nandi A, Noor N, Joshi T, Bhargava M. Incidence of maternal near-miss and mortality cases in central India tertiary care centre and evaluation of various causes. *New Indian J OBGYN*. 2018;4(2):112–116.