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Maternal Near Miss Among Women Admitted to Al-Manathera General Hospital/ Iraq

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Abstract:

Introduction: Maternal near-miss (MNM) precedes maternal mortality, both are indicators of the quality of health care services provided to pregnant women, and their cases have common characteristics, especially in terms of risk factors. The objective of the study is to identify causes and the factors associated with maternal near-miss through women admitted to Al- Manathera general hospital in the Al-Najaf governorate/ Iraq.

Materials and Methods: Descriptive cross-sectional study was conducted in the obstetric ward and labor room of Al Manathera general hospital. The data collection period lasted three months from March to June 2022. About 165 women were enrolled in this study, Fifty-five women met the WHO criteria for a near miss. A structured questionnaire was used to collect the data for women admitted to a labor room and obstetric wards. Data analyzed by using the statistical package of SPSS-25 and Pearson Chi-square test (χ^2-test) was used to compare the distributions of factors associated with maternal near miss. The significance level was established at p-value ≤ 0.05.
Result: During three months, the total number of deliveries was 1596 and the total live births were 1583. The total number of near miss cases was 55. Severe obstetric hemorrhage was the most common cause of maternal near-miss (65.5%) followed by severe preeclampsia (18.2%). Factors that were significantly associated with MNM (compared to Non MNM) were women education ($p = 0.023$), gravidity ($p = 0.004$), mode of delivery ($p = 0.000$), gestational age ($p = 0.000$), desire of the last pregnancy ($p = 0.001$), last birth outcome ($p = 0.000$) and history of any obstetric complications ($p = 0.000$).

Conclusion and Recommendations: Severe obstetric hemorrhage and severe preeclampsia were the most common causes of maternal near miss. Factors found to be associated with maternal near miss are women's education, gravidity, mode of delivery, gestational age at delivery, desire of the last pregnancy, last birth outcome, and history of any obstetric complications. To reducing MNM in Al-Manathera general hospital should focus on women who are at risk of maternal near miss and increase access to maternal health care services by enhancing the efforts of health care providers in the delivery room.

Key words: Al-Manathera hospital, maternal near-miss, pregnancy, delivery.

Introduction:

Maternal near-miss (MNM) is a situation in which a woman would have died had she not received quality medical care [(1)]. Maternal mortality is a major public health issue defined by the World Health Organization (WHO) as "death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes" [(2)]. Each day over 800 women are dying from complications in pregnancy and

childbirth, and for every woman who dies, approximately 20 others suffer serious injuries, infections or disabilities [3].

The MNM concept says that for a maternal death to occur, there must be at least one life-threatening condition or organ dysfunction. Hence, WHO proposed the definition of MNM by identifying the life-threatening conditions using clinical, laboratory and management-based criteria [4]. A review of near-miss cases highlighted the shortcomings and positive elements of the quality of maternal healthcare, and can help to identify preventable factors that, if addressed, would improve the quality of services offered, also identifies the determinants of near misses and contributes to improving the management of a mother's severe life-threatening complications [5].

The determinants of near-miss cases are classified into 2 groups of factors: those related to access to care and clinical factors related to quality of care. Found that factors related to providers and quality of care are more preventable; these factors are related to delays in healthcare services and influence the state of the mother and newborn at all levels of care demand [6].

In 2017, Iraq ranks 79 in the maternal mortality ratio out of a total of 185 countries around the world [7]. There is a slow improvement toward achieving the target of a maternal mortality ratio (MMR) of less than 70 per 100,000 live births by 2030 [5]. In order to achieve Sustainable Development Goals (SDGs), it is important to identify the causes of maternal mortality. Women who endure severe morbidities in the course of pregnancy, childbirth, and the postpartum period can help us to better understand the set of circumstances and avoidable factors that contribute to maternal deaths [1] .

Few studies have been performed in Iraq to identify the factors that cause obstetric complications and leading to near misses. Therefore, this study was carried out to identify causes and factors associated with maternal near-miss through women admitted to Al Manathera general hospital, Al Najaf governorate, Iraq, In 2022.

Materials and methods:

Study design, duration and setting: This was a descriptive cross-sectional study lasted for three months, starting from 1st March to 29th June,2022, conducted in obstetric ward and labor room of Al Manathera general hospital. Al-Manathera general hospital is a tertiary peripheral care center located in the Al-Najaf Al-Ashraf governorate, which is one of the cities in Iraq, located to the south of Baghdad by about 160km. Al-Manathera hospital established in 1973 and it provides medical and treatment services to the residents of the Al- Manathera region in addition to the patients from surrounding rural areas because it is closest to their areas. The number of beds is 165 distributed in hospital wards.

Study Sample: Women who were admitted at Al-Manathera hospital during pregnancy, labor, or within the first 42 days of termination of pregnancy.

- **Maternal Near Miss:** Women who admitted to the hospitals due to pregnancy-related complications, delivery, abortion, or within 42 days of termination of pregnancy. And those who fulfill at least one of the diagnostic maternal near-miss validated disease-specific criteria proposed by WHO.

- **Non-near miss:** women who admitted to the same hospital with normal vaginal delivery without complications.

Data Collection: the researchers collected data by develop a structured questionnaire composed of three main parts: mother sociodemographic characteristics, reproductive and obstetric characteristics and causes of maternal near misses and the women were interviewed to identify potential predisposing factors and causes of maternal near-miss. The diagnosis of obstetric complications, laboratory investigation, and management were extracted from patient medical records and discharge summaries.

Where multiple causes of maternal near-miss were recorded, the primary cause was identified and the time spent to fill the questionnaire required about 10-15 minutes.

Statistical Analysis: Data was tabulated on Microsoft Office Excel 2016 and analyzed by using the available statistical package of SPSS-25 (Statistical Packages for Social Sciences- version 25). All variables were entered as categorical. Proportions, frequencies, and averages were calculated for study variables. Pearson Chi-square test (χ^2-test) with the application of Yate's correction or Fisher Exact test was used to compare the distributions of factors associated with maternal near miss. Statistical significance was described as comparisons with probability value

was equal or less than 0.05 was considered statistically significant.

Results:

In this study period, the total number of deliveries was 1596 and the total number of live births were 1583. The total number of near miss cases was 55 during the study.

Causes of Maternal Near Misses: In this study, Severe obstetric hemorrhage was the most common cause of maternal near-miss (65.5%) followed by severe preeclampsia (18.2%). Other causes of MNM were severe anemia (3.6%), uterine dysfunction (3.6%) and coagulation dysfunction (3.6%). One case (1.8%) was due to laparotomy, (1.8%) sepsis and (1.8%) due to ruptured uterus **(Figure 1)**.

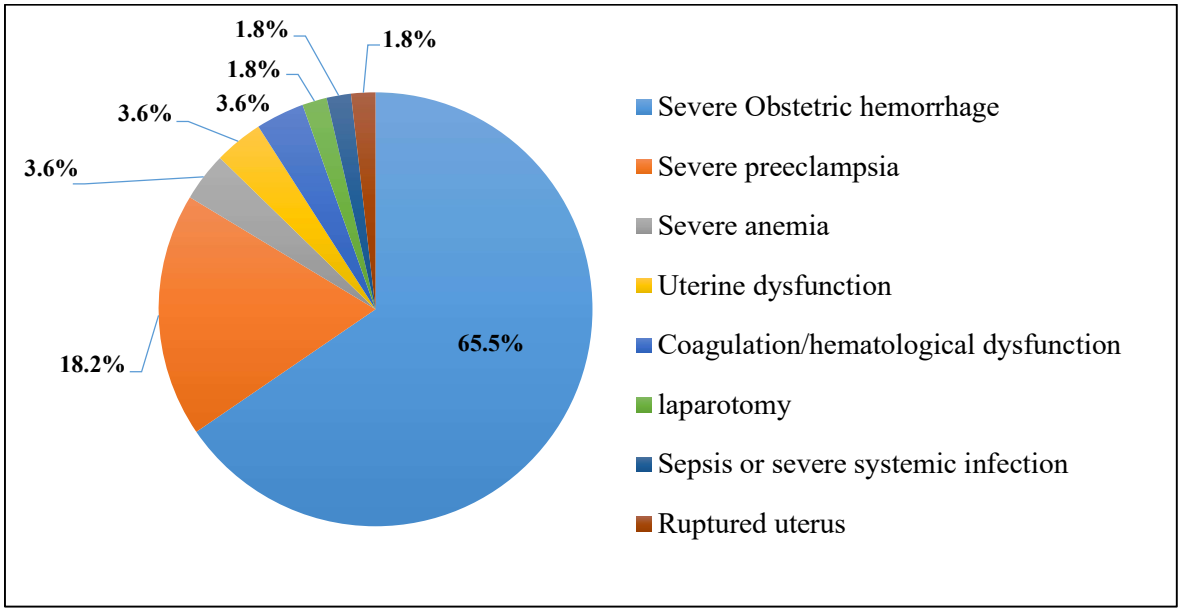

Figure 1: Causes of maternal near-miss among women admitted to Al- Manathera hospital 2022

Sociodemographic characteristics: 165 women who were enrolled in the study, 55 were near misses and 110 were without near miss events. (78.2%) of near- miss cases belong to the 20–34 years' age groups. The majority (65.5%) of the near miss cases being rural residents. On the Chi-square test, the maternal age and residence differences between cases and women without a near miss were not statistically significant. Regarding education women status, a high proportion (50.9%) of cases were illiterate. The education women status difference between near-miss cases and women without a near miss was statistically significant at p-value = 0.02 (**Table 1**). Husband education, women occupation status and husband occupation status were factors not associated statistically with MNM in this study at p-value more than 0.05.

Reproductive and Obstetric characteristics: **(Table 2)** show reproductive and obstetric characteristics of study participants. The proportion of age at marriage among near-miss cases and women without a near miss was comparable (50.9%) and (53.6%), respectively. Number of pregnancies (45.5%) of cases had five or more pregnancies but the highest percentage of women without a near miss (58.2%) with (2-4) pregnancies. (36.4%) of cases were ended pregnancy by curettage procedure, while (64.5%) of women without a near miss had a normal delivery. About (36.4%) of cases with gestational age at (<8 -11w) weeks and (97.3%) among women without a near miss at gestational age at (36 - 42) weeks. Regarding desire of the last pregnancy, about (50.9%) of cases were not planning for pregnancy. Moreover, (67.3%) of cases an outcome of last pregnancy was dead birth. Most of near-miss cases (83.6%) were without previous history of any obstetric complications.

On the other hand, it was found in this study statistically significant difference in the reproductive and obstetrics characteristics (gravidity, mode of delivery, gestational age at delivery, desire of the last pregnancy, last birth outcome and history of any obstetric complications) at p-value (< 0.05).

Characteristics		Maternal near miss		Total(n=165)	P-value
		Yes	No		
Maternal age	<20 year	4 (7.3%)	12 (10.9%)	16(9.7%)	0.193
	20-34 year	43 (78.2%)	91 (82.7%)	134 (81.2%)	
	≥35 year	8 (14.5%)	7 (6.4%)	15 (9.1%)	
Residence	Rural	36 (65.5%)	59 (53.6%)	95 (57.6%)	0.148
	Urban	19 (34.5%)	51 (46.4%)	70 (42.4%)	
Women Education	Illiterate	28 (50.9%)	30 (27.3%)	58 (35.2%)	**0.023***
	Primary school	12 (21.8%)	36 (32.7%)	48 (29.1%)	
	Intermediate school	5 (9.1%)	23 (20.9%)	28 (17.0%)	
	Secondary school	2 (3.6%)	8 (7.3%)	10 (6.1%)	
	Higher education	8 (14.5%)	13 (11.8%)	21 (12.7%)	
Husband Education	Illiterate	6 (10.9%)	7 (6.4%)	13 (7.9%)	0.499
	Primary school	23 (41.8%)	37 (33.6%)	60 (36.4%)	
	Intermediate school	11 (20.0%)	29 (26.4%)	40 (24.2%)	
	Secondary school	5 (9.1%)	17 (15.5%)	22 (13.3%)	
	Higher education	10 (18.2%)	20 (18.2%)	30 (18.2%)	
Women occupation status	Employee	6 (10.9%)	5 (4.5%)	11 (6.7%)	0.298
	Housewife	47 (85.5%)	100 (90.9%)	147 (89.1%)	
	Student	2 (3.6%)	5 (4.5%)	7 (4.2%)	
Husband occupation status	Employee	29 (52.7%)	56 (50.9%)	85 (51.5%)	0.677
	Not employee	25 (45.5%)	49 (44.5%)	74 (44.8%)	
	Student	1 (1.8%)	5 (4.5%)	6 (3.6%)	

Table 1: Sociodemographic characteristics of women admitted to Al- Manathera hospital: *Significant difference between proportions using Pearson Chi-square test at 0.05 level.

Table 2: Reproductive and obstetric characteristics of women admitted to Al- Manathera hospital:

Characteristics		Maternal near miss		Total (n=165)	P value
		Yes	No		
Age at Marriage	< 18 years	27 (49.1%)	51 (46.4%)	78 (47.3%)	0.741
	≥ 18 years	28 (50.9%)	59 (53.6%)	87 (52.7%)	
Gravidity/Number of pregnancies	1	9 (16.4%)	23 (20.9%)	32 (19.4%)	**0.004 ***
	2-4	21 (38.2%)	64 (58.2%)	85 (51.5%)	
	≥ 5	25 (45.5%)	23 (20.9%)	48 (29.1%)	
Parity/ Number of births	0	10 (18.2%)	25 (22.7%)	35 (21.2%)	0.302
	1-4	37 (67.3%)	77 (70.0%)	114 (69.1%)	
	≥ 5	8 (14.5%)	8 (7.3%)	16 (9.7%)	
History of abortions	No previous abortion	35 (63.6%)	82 (74.5%)	117 (70.9%)	0.239
	Once	12 (21.8%)	20 (18.2%)	32 (19.4%)	
	More than once	8 (14.5%)	8 (7.3%)	16 (9.7%)	
Antenatal care at last pregnancy	Regular	33 (60.0%)	81 (73.6%)	114 (69.1%)	0.175
	Not regular	20 (36.4%)	25 (22.7%)	45 (27.3%)	
	Non	2 (3.6%)	4 (3.6%)	6 (3.6%)	
Mode of delivery	Cesarean section	7 (12.7%)	39 (35.5%)	46 (27.9%)	**0.000 ***
	Curettage	20 (36.4%)	0 (0.0%)	20 (12.1%)	
	Normal vaginal	13 (23.6%)	71 (64.5%)	84 (50.9%)	
	Other	15 (27.3%)	0 (0.0%)	15 (9.1%)	
Frequency of cesarean section	Once	5 (9.1%)	14 (12.7%)	19 (11.5%)	0 .672
	More than once	8 (14.5%)	19 (17.3%)	27 (16.4%)	
	No previous C/s	42 (76.4%)	77 (70.0%)	119 (72.1%)	
Gestational age (Weeks)	<8 -11w	20 (36.4%)	0 (0.0%)	20 (12.1%)	**0 .000***
	12 - 23 w	17 (30.9%)	0 (0.0%)	17 (10.3%)	
	24---31w	0 (0.0%)	0 (0.0%)	0 (0.0%)	

	32 - 35 w	1 (1.8%)	3 (2.7%)	4 (2.4%)	
	36 - 42 w	17 (30.9%)	107 (97.3%)	124 (75.2%)	
Birth interval	< 24 Month	10 (18.2%)	24 (21.8%)	34 (20.6%)	0 .586
	≥ 24 Month	45 (81.8%)	86 (78.2%)	131 (79.4%)	
Desire of the last pregnancy	Planned	27 (49.1%)	82 (74.5%)	109 (66.1%)	**0 .001***
	unplanned	28 (50.9%)	28 (25.5%)	56 (33.9%)	
Last birth outcome	Alive	18 (32.7%)	109 (99.1%)	127 (77.0%)	**0 .000***
	Dead	37 (67.3%)	1 (0.9%)	38 (23.0%)	
Place of birth	Health facility	55(100.0%)	110(100.0%)	165(100.0%)	
	Home	0 (0.0 %)	0 (0.0%)	0 (0.0%)	
Previous history of any obstetric complications	Yes	9 (16.4%)	1 (0.9%)	10 (6.1%)	**0.000***
	No	46 (83.6%)	109 (99.1%)	155 (93.9%)	

***Significant difference between proportions using Pearson Chi-square test at 0.05 level.**

Discussion:

Maternal near miss cases and maternal deaths are together referred to as severe maternal outcomes. Data on severe morbidity are important for decision makers to recognize essential obstetric care. Maternal near miss findings are indicators for planning, monitoring, follow-up, and evaluating mothers care programs. This study has shed light on causes, and factors that are associated with maternal near miss (MNM) for three months through women admitted to Al- Manathera general hospital in the Al-Najaf governorate/ Iraq.

Causes of maternal near miss:

The most common cause of a maternal near miss in this study was severe obstetric hemorrhage followed by severe preeclampsia (hypertensive disorders in pregnancy), which was similar to the study done by Dessalegn et al. [8] in Ethiopia and the study by Sultana et al. [9] in Pakistan, revealed that hemorrhage and hypertensive disorders were the leading causes of near-miss cases. Another study was done in a rural tertiary care center in India by Verma et al. in 2020 [10] showed hypertensive disorders in pregnancy and hemorrhage were the two leading causes of near-miss events. In many studies, hemorrhage and hypertensive disorders are the most important causes for both maternal morbidity and mortality. Early recognition of women at high risk and referral, if required to facilities with available surgical, intensive care, treatment, and blood bank services, are essential strategies to prevent mortality from these causes.

Factor associated with MNM:

Regarding sociodemographic characteristics, most maternal near miss cases were illiterate and it has been found that women's education was only factor associated with MNM ($p = < 0.05$). This is comparable with studies done in Ethiopia [8] and in Morocco [11]. Education increases women access to relevant information and may facilitate the financial means need to seek better health care services.

Regarding reproductive and obstetric characteristics, the number of pregnancies, mode of delivery, number of previous normal delivery, gestational age at delivery, desire of the last pregnancy, last birth outcome and history of any obstetric complications identified in our study as associated factors with MNM cases.

In the current study, most MNM cases had number of pregnancies ≥ 5 and this factor statistically associated with MNM ($p = 0.004$). Which is consistent with study in Ethiopia[12] and it is known that women who have more than four pregnancies are prone to damage since they have an increased risk of anemia, hemorrhage, and congenital anomalies [13].

Our research revealed that significant association between mode of delivery and MNM cases with p = 0.000 and most MNM cases ended pregnancy by curettage procedure. This result incompatible with the study by Nelissen et al. [5] most MNM cases ended pregnancy by normal vaginal delivery and other study by Sultana et al. [9] showed that the majority of MNM cases were delivered by cesarean section. According to DeCherney et al., curettage use suction to remove uterine contents may be used following a miscarriage to remove the fetus and other tissues if they have not all been naturally passed. Infection or heavy bleeding can occur if these tissues are not completely removed [14].

One of the obstetrics factors associated with MNM was the gestational age (weeks) at p= 0.000 and high percent of MNM with gestational age <8 -11w. This result disagreed with studies by Mekonnen et.al [15] during the period 2018-2019 in Ethiopia and study in India [10], which demonstrated that most of the near-miss cases were in the third trimester of pregnancy. The possible explanation of this result may due to different types of first trimester complications which include abortion, gestational trophoblastic disease, ectopic pregnancy and hyperemesis gravidarum [16].

This study also revealed that association between desire of the last pregnancy and MNM cases at p= 0 .001 and most cases with unplanned pregnancy. This result incompatible with studies of Habte et al. [17] and Alemu et a. [1] which found that no significant association between the type of pregnancy (planned or unplanned) and develop MNM cases. The possible causes of differences may be attributed to low awareness about family planning and contraceptive use among countries.

Another factor associated with MNM cases in this study was the last birth outcome with p = 0.000 and most MNM cases had a dead birth as outcome of last pregnancy. This finding consistent with the studies done in Nigeria [18] and in Somalia [19]. This could be explained by the fact that women with dead birth more vulnerable to psychological health problems, which may increase risk of complications in other pregnancies.

In consistence with previous studies conducted in other countries [12, 19,20]. Maternal near miss was significantly associated with previous history of any obstetric complications in this study at p-value = 0. 000. Prenatal care and special attention from families to reduce the possibility of obstetric complications during pregnancy and the delivery period.

Conclusions:

In conclusion, this study identify that severe obstetric hemorrhage and severe preeclampsia were the most common causes of maternal near-miss cases among women admitted to Al-Manathera hospital. Women's education, gravidity, mode of delivery, gestational age at delivery, desire of the last pregnancy, last birth outcome, and history of any obstetric complications were factors associated with a maternal near miss.

Recommendations:

- The study recommends emphasizing women who are at risk of maternal near miss and increase access to maternal health care services by enhancing the efforts of health care providers in the delivery room in Al-Manathera hospital.
- Most MNM cases occur when that reach delayed, so it is necessary to increase awareness programs regarding antenatal checkups and blood investigations routinely.
- Improving the referral systems in public facilities so that women can contact the healthcare facility in time.
- Further studies are needed with stronger design and included large number of obstetric care hospitals in Al-Najaf governorate to obtain accurate data about maternal near miss.

References:

1. Alemu, F. M., Fuchs, M. C., Vitale, T. M., & Salih, M. A. M. (2019). Severe maternal morbidity (near-miss) and its correlates in the world's newest nation: South Sudan. *International journal of women's health*, *11*, 177.
2. WHO 2010.ICD-10: International Classification of Diseases and Related Health Problems. 10th Revision, Vol. 2, Instruction Manual. Geneva: WHO
3. World Health Organization. "Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division." (2019).
4. WHO. Evaluating the quality of care for severe preg- nancy complications. In: The WHO near-miss approach for maternal health; 2011. Report No.: 978 92 4 150222 1.

5. Nelissen, E. J., Mduma, E., Ersdal, H. L., Evjen-Olsen, B., van Roosmalen, J. J., & Stekelenburg, J. (2013). Maternal near miss and mortality in a rural referral hospital in northern Tanzania: a cross-sectional study. *BMC pregnancy and childbirth*, *13*(1), 1-10.
6. Assarag, B., Dujardin, B., Delamou, A., Meski, F. Z., & De Brouwere, V. (2015). Determinants of maternal near-miss in Morocco: too late, too far, too sloppy?. PloS one, 10(1), e0116675.
7. World Development Indicators (WDI) (2020). Iraq - Maternal Mortality Ratio. Accessed online on May 2020: https://knoema.com/WBWDI2019Jan/world-development-indicators-wdi.
8. Dessalegn, F. N., Astawesegn, F. H., & Hankalo, N. C. (2020). Factors associated with maternal near miss among women admitted in West Arsi Zone public hospitals, Ethiopia: Unmatched case-control study. Journal of pregnancy, 2020.
9. Sultana, S., Ishtiaque, S., Fareed, S., Kamal, S., Aslam, Z., Hussain, R., & Lashari, S. (2019). Clinical spectrum of near-miss cases in obstetrics. Cureus, 11(5).
10. Verma, V., Kanti, V., Vishwakarma, S., Gupta, U. K., & Shree, P. (2020). "Near-miss" obstetric events and maternal deaths in a rural tertiary care center in North India. Cureus, 12(12).
11. Assarag, B., Dujardin, B., Delamou, A., Meski, Z., & Brouwere, V. D. (2015). Determinants of Maternal Near-Miss in Morocco: Too Late, Too Far, Too Sloppy?. PLoS ONE, 10(1). https://doi.org/10.1371/journal.pone.0116675
12. Mekango, D. E., Alemayehu, M., Gebregergs, G. B., Medhanyie, A. A., & Goba, G. (2017). Determinants of maternal near miss among women in public hospital maternity wards in northern Ethiopia: a facility based case-control study. PLoS One, 12(9), e0183886.
13. Fernandes, B. B., Nunes, F. B. B. D. F., Prudêncio, P. S., & Mamede, F. V. (2015). Epidemiological Research of the Maternal Deaths and Compliance with The Fifth Millennium Development Goal. Revista gaucha de enfermagem, 36(SPE), 192-199.
14. DeCherney, A. H., Roman, A. S., Nathan, L., & Laufer, N. (2018). Current diagnosis & treatment obstetrics & gynecology. McGraw Hill Professional.
15. Mekonnen, A., Fikadu, G., Seyoum, K., Ganfure, G., Degno, S., & Lencha, B. (2021). Factors associated with maternal near-miss at public hospitals of South-East Ethiopia: An institutional-based cross-sectional study. Women's Health, 17, 17455065211060617.
16. Khaskheli, M., Baloch, S., & Baloch, A. S. (2010). Risk factors in early pregnancy complications. J Coll Physicians Surg Pak, 20(11), 744-7.
17. Habte, A., & Wondimu, M. (2021). Determinants of maternal near miss among women admitted to maternity wards of tertiary hospitals in Southern Ethiopia, 2020: A hospital-based case-control study. PloS one, 16(5), e0251826
18. Adeoye, I. A., Onayade, A. A., & Fatusi, A. O. (2013). Incidence, determinants and perinatal outcomes of near miss maternal morbidity in Ile-Ife Nigeria: a prospective case control study. BMC pregnancy and childbirth, 13(1), 1-10.
19. Dahie, H. A. (2022). Determinants of maternal near miss events among women admitted to tertiary hospitals in Mogadishu, Somalia: a facility-based case–control study. BMC Pregnancy and Childbirth, 22. https://doi.org/10.1186/s12884-022-04987-3
20. Sikder, S. S., Labrique, A. B., Shamim, A. A., Ali, H., Mehra, S., Wu, L., ... & Christian, P. (2014). Risk factors for reported obstetric complications and near misses in rural northwest Bangladesh: analysis from a prospective cohort study. BMC Pregnancy and Childbirth, 14(1), 1-13.