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MATERNAL NEAR MISS AS HEALTH CARE INDICATOR: AN INTEGRATIVE REVIEW

Near Miss materno como indicador de atenção à saúde: uma revisão integrativa

Near Miss materno como indicador de atención a salud: una revisión integrativa

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ABSTRACT

Objective: The objective was to make a synthetic and descriptive compilation of the results of scientific studies addressing maternal near miss. **Methods**: A search was conducted in the databases of the Electronic Scientific Library Online (SciELO), Latin American and Caribbean Literature (LILACS) and International Literature in Health and Biomedical Sciences (PubMed), in the period from 2011 to June 2016, with the descriptors "maternal near miss" and "severe maternal morbidity" and their representations in Portuguese and English. After the exclusion of duplicate texts, the reading of the abstracts and the analysis by validated instrument, this review comprised 28 publications. **Results**: The studies indicate clinical determinants directly related to the occurrence of maternal near miss, among which, these stand out: high-risk gestation; hospitalizations during pregnancy; clinical comorbidities, mainly severe hypertension, infections and hemorrhage; cesarean delivery; use of forceps and need for ICU admission. **Conclusion**: In addition to the clinical determinants, the studies point out that socioeconomic and healthcare factors are directly related to the occurrence of maternal near miss, which makes it a viable tool for evaluation of the quality of the healthcare service and the impact of public policies aimed at improving maternal health and reducing social inequities. Early detection and provision of emergency obstetric care are essential to reduce maternal near miss and mortality rates.

Descriptors: Maternal Mortality; Near Miss, Healthcare; Morbidity; Maternal-Infant Health; Pregnancy Complications.

RESUMO

Objetivo: *Objetivou-se compilar sintética e descritivamente resultados de estudos científicos que versam acerca do Near Miss Materno.* ***Métodos:*** *Realizou-se consulta às bases de dados Biblioteca Científica Eletrônica Online (SciELO), Literatura Latino-Americana e do Caribe (LILACS) e Literatura Internacional em Ciências da Saúde e Biomédica (PubMed), no período de 2011 a junho de 2016, com os descritores "Maternal Near Miss" and "severe maternal morbidity" e suas representações nos idiomas português e inglês. Após a exclusão dos textos repetidos, da leitura dos resumos e da análise por instrumento validado, esta revisão contou com 28 publicações.* ***Resultados:*** *Os estudos apontam determinantes clínicos diretamente relacionados à ocorrência do Near Miss Materno. Dentre eles, destacam-se: gestação de alto risco; internações durante a gestação; comorbidades clínicas, principalmente hipertensão grave, infecções e hemorragias; partos*

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cesáreos; uso de fórceps e necessidade de admissão em UTI. ***Conclusão:*** *Os estudos apontam, além dos determinantes clínicos, que fatores socioeconômicos e de assistência estão diretamente relacionados à ocorrência de Near Miss Materno, o que o torna uma ferramenta viável para avaliação da qualidade do serviço de saúde e do impacto de políticas públicas direcionadas à melhoria da saúde materna e de redução das iniquidades sociais. A detecção precoce e a oferta de cuidados obstétricos de emergência tornam-se essenciais para a redução das taxas de Near Miss e de mortalidade materna.*

Descritores: *Mortalidade Materna; Near Miss; Morbidade; Saúde Materno-Infantil; Complicações na Gravidez.*

RESUMEN

Objetivo: *El objetivo fue compilar de modo resumido y descriptivo los resultados de estudios científicos sobre el Near Miss Materno.* ***Métodos:*** *Se realizó consulta en las bases de datos Biblioteca Científica Electrónica Online (SciELo), Literatura Latino-Americana y del Caribe (LILACS) y Literatura Internacional de Ciencias de la Salud y Biomédico (PubMed) en el periodo entre 2011 y junio de 2016 con los descriptores "maternal Near Miss" and "severe maternal morbidity" y sus representaciones en los idiomas portugués e inglés. Se incluyeron 28 publicaciones en la revisión tras la exclusión de los textos duplicados, de la lectura de los resúmenes y del análisis por instrumento validado.* ***Resultados:*** *Los estudios señalan determinantes clínicos directamente relacionados con la ocurrencia del Near Miss Materno. Entre ellos se destacan: el embarazo de alto riesgo; los ingresos durante el embarazo; las comorbilidades clínicas, principalmente la hipertensión grave, las infecciones y las hemorragias; los partos por cesárea; el uso de fórceps y la necesidad de admisión en la UCI.* ***Conclusión:*** *Los estudios señalan que además de los determinantes clínicos, los factores socioeconómicos y de asistencia están directamente relacionados con la ocurrencia del Near Miss Materno lo que le hace una herramienta viable para la evaluación de la calidad del servicio de salud y del impacto de las políticas públicas dirigidas para la mejoría de la salud materna y de la reducción de las inequidades sociales. La detección precoz y la oferta de los cuidados obstétricos de emergencia son esenciales para la disminución de las tasas del Near Miss y de la mortalidad materna.*

Descriptores: *Mortalidad Materna; Near Miss Salud; Morbilidad; Salud Materno-Infantil; Complicaciones del Embarazo.*

INTRODUCTION

The relevance of debates on health during pregnancy is understood as concrete possibilities for reorientation of the management of women's health care and for incorporation of the guidelines that recommend quality and safety to women's health in the pregnancy-puerperium cycle, with focus on combating maternal mortality, one of the goals of the millennium, which has not yet been accomplished in several countries[1].

In this purposeful construction, the World Health Organization (WHO) estimates that, in 2010, 287,000 women died worldwide during gestation and in childbirth. Despite the reduction of 47% in relation to 1990, that rate is far from the goal of having maternal deaths reduced by 75% by 2015[2]. Maternal death resulting from a normal pregnancy is not an isolated fact. It may derive from a sequence of events that culminate in a state of severe dysfunction and/or organic failure.

In such a dysfunctional context, the concept of Maternal Near Miss emerges, which is used to describe "a woman who nearly died but, nevertheless, survived the complication that arose during pregnancy, childbirth or within 42 days of termination of gestation" (p.7)[3].

Women who survive severe pregnancy, childbirth and puerperium complications bear similarities to those who have died due to such complications, which makes them primary sources of information on the social determinants related to maternal mortality. It is estimated that, for each maternal death in Latin America, 15 near miss cases occur, which renders this condition a serious public health problem[4] and a challenge to the government spheres in the organization of a qualified and resolutive care network.

Due to the greater proportion of cases related to the occurrence of deaths[2] and the fact that women themselves are allowed to report their disease process, the near miss assessment makes it possible to understand the determinants of death in severely ill women, enabling the development of effective strategies for reduction of maternal morbidity and mortality, considering that the outcome is the only condition that differentiates them[3-14]. Despite this, there are still few studies on the impact of near miss on the life of these women[5].

Determining the proportion of women who reach a health care unit with severe maternal dysfunction is feasible and provides information on the occurrence of delays in the recognition of risk conditions[3], being a determinant of crucial importance for the development and reorientation of public policies. Furthermore, the debate about the concept of Maternal Near Miss is crucial for the development of strategies to promote women's and mother-fetus binomial's health[4].

As a preliminary step in an interinstitutional project that aims to map the trajectory of women with severe maternal morbidity (SMM) through the flow of the Health Care Network, the authors propose this review article in an effort to compile available information about Maternal Near Miss. Throughout the text, the article presents topics that contemplate the concept

of Maternal Near Miss, the determinants, the prevalence, the available criteria for evaluation of this morbidity, the diagnostic criteria, and the discussions about the possibility of incorporating its occurrence as one of the indicators for assessing the quality of care in reproductive health for women.

Therefore, questions are raised: which factors, besides the clinical ones, can determine SMM? Since standardization is critical to the uniformity of analyses, which criteria are available for evaluation of Maternal Near Miss? How can the concept of near miss be used to guide public policies? In order to elucidate such questionings, the objective was to make a synthetic and descriptive compilation of the results of scientific studies addressing Maternal Near Miss.

METHODS

This is an integrative review carried out by means of consultation in the databases of the Electronic Scientific Library Online (SciELO), Latin American and Caribbean Literature (LILACS) and International Literature in Health and Biomedical Sciences (PubMed), in the period from 2011 to June 2016. For selection of articles, the MeSH terms "maternal near miss" and "severe maternal morbidity" and their representations in the Portuguese and English languages were used, respecting the particularities of the databases.

Opinion articles, editorials, letters to editors and comments were excluded. Based on these criteria, the analytical platform comprised studies of clinical trials and observational studies (cohort, case-control and cross-sectional studies).

Thus, by crossing the descriptors, the following findings were originated: total of 215 articles, among which there were 76 duplicates in the databases, resulting in 139 studies. After reading the abstracts in an attentive way and directed to the guiding questions of the object of investigation, it was detected that 91 studies did not meet the established criteria, resulting in only 48 studies kept in the process. These articles were analyzed based on the validated instrument[6], which made it possible to identify the publications and characterize them with regard to the methodology criteria and the evaluation of the methodological rigor, considering the research design[7] and the level of evidence[8] of the researches carried out (Figure 1).

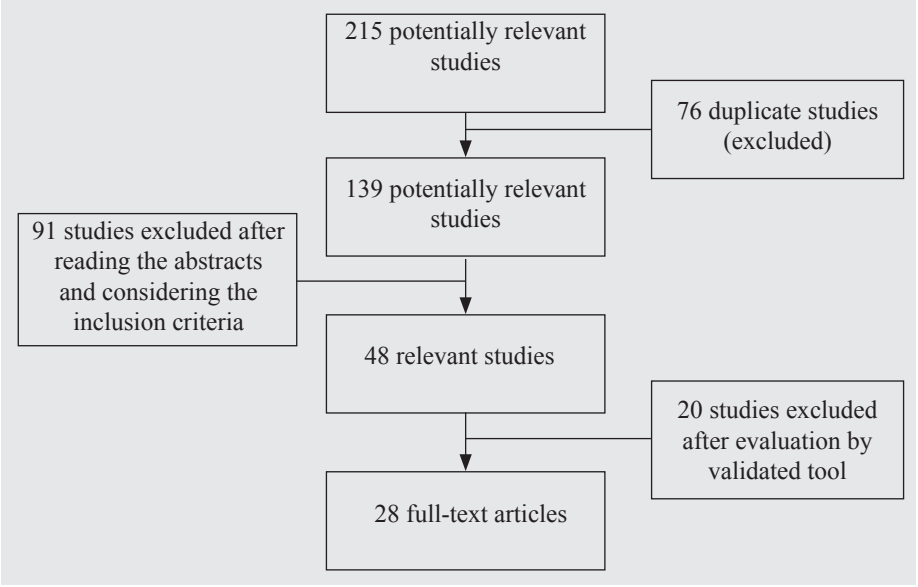

Figure 1- Flowchart of the selection process of articles for the integrative literature review.

RESULTS

After re-reading and analyzing the abstracts under the guidance of the inclusion and exclusion criteria, the recommendations contained in the validated instrument[6], methodological rigor[7] and evidence[8], 28 publications constituted the corpus to be analized in this review. The analysis and synthesis of the bibliographic data on the subject was carried out with the objective of bringing together, in the present integrative review, the knowledge produced worldwide about Maternal Near Miss.

Determinants of severe maternal morbidity (SMM)

The determinants of severe maternal morbidity, evidenced in a study that investigated Maternal Near Miss cases in a maternity hospital in Teresina, Piauí, Brazil, from September 2012 to February 2013, with a sample of 409 women, revealed 343 with SMM, 56 Maternal Near Miss cases and 10 maternal deaths. Near miss occurred in 9.6 cases/1000 live births, and its main causes, together with the causes of maternal mortality, were distributed as hypertensive, hemorrhagic and infectious

disorders. Infectious abortion proved to be the single most common cause of maternal death. Cesarean delivery was present in 87.5% of near miss cases, reported for women with eclampsia and HELLP syndrome (hemolysis, elevated liver enzymes and low platelets), placental abruption, labor induction failure, and fetal distress[10].

In a research held in southeastern Iran, researchers considered eight referral hospitals for analysis and a sample of 501 Maternal Near Miss cases in 19,908 births in 2013[14]. These occurrences have a Maternal Near Miss ratio of 25.2/1000 live births, predominating as severe pre-eclampsia (27.3%), ectopic pregnancy (18.4%) and placental disorders (16.2%). Among these cases, 15.2% required care in an intensive care unit (ICU), distributed as hemorrhagic disorders (46.1%) and those related to hypertensive diseases (31.9%) [15].

An ecological study, carried out in India, draws attention to non-obstetric causes of mortality, shown as the largest isolated group [48,11% (102/212)]. Rheumatic heart disease and fulminant hepatic failure were the most important morbidities that resulted in maternal death. Infections [19.8% (42/212)], other than puerperal sepsis, continue to be a major cause of maternal death, with pulmonary tuberculosis, typhoid and malaria as the main ones. There were cases of maternal deaths due to H1N1 during an outbreak. Sunstroke caused six maternal deaths during a 10-year period[16].

In Rio Grande do Norte State, Brazil, a study carried out between October 2013 and September 2014, which included 492 women, showed as a risk factor, in addition to the clinical conditions that corroborate the aforementioned studies, a number of prenatal care consultations under the recommendations (OR=5.0; PR=4.2; 95%CI 2.5–9.7) and the cesarean delivery method (OR=39.2; PR=31.2; 95%CI 9.3–164.5)[17]. This finding is corroborated by other studies that associate the absence of antenatal care with an increased risk of developing a near miss occurrence[18-31].

A case-control study carried out in Morocco with 299 women in 2012 found a Maternal Near Miss incidence of 12/1000 live births, with a higher proportion of the following risk factors, when compared to the control group: illiteracy (65% versus 22%, p<0.001); low socioeconomic status (42% versus 10%, p<0.001); history of previous abortion (21% versus 7%, p<0.001); greater occurrence of pregnancy complications (51% versus 19%, p<0.001); and, lastly, a lower proportion of women with near miss had access to health care within 24 hours of onset of labor (19% versus 67%). The near miss cases listed the following conditions: hypertensive syndromes (45%), haemorrhages (39%), and severe infections (10%)[31].

The literature points the educational level as a protective factor for promotion and maintenance of maternal and child health. A study identified a significant association between low schooling and severe maternal outcomes (OR=2.07; 95%CI 1.46–2.95), with cases of Maternal Near Miss (OR=1.80; 95%CI 1.25–2.57) and maternal death (OR=5.62; 95%CI 3.45–9.16), an association that persisted in countries with a medium (OR=2.36; 95%CI 1.33– 4.17) and a low Human Development Index (HDI) (OR=2.65; 95%CI 1.54–2.57). Women with less years of schooling had a 2.06 times greater chance of reaching the hospital in a serious condition, that is, the organic dysfunction on arrival or within 24 hours (OR=2.06; 95%CI 1.36–3.10) [24]. These findings are corroborated by other studies[18-24].

With regard to the sociodemographic variables, a higher risk for the development of the Maternal Near Miss condition was found in married patients (OR=7.9; PR=7.1; 95%CI 2.4–26.1), with incomplete high school (OR=3.1; PR=2.8; 95%CI 1.6–6.0), coming from the midland (OR=4.6; PR=4.0; 95%CI 2.1–10.0), and with family income lower than a minimum wage (OR=7.0; PR=5.5; 95%CI 3.6–6.6). The authors also evidenced that nonwhite women presented a 2.5-fold higher relative risk of "becoming" survivors (OR=2.5; PR=2.3 and 95% CI)[18].

In a research conducted in the United States, national data were used to classify hospitals by their proportion of black women's deliveries and to analyze the cases of SMM. Researchers found that SMM cases often occur among women who gave birth in hospitals with more frequent delivery of black women compared to those with a lower frequency (29.4 and 19.4 vs. 12.2 per 1000 births, respectively; P<0.001). There were also more cases of SMM among black than non-black women, regardless of the hospital (25.8 versus 11.8 per 1000 births, respectively; P<0.001) [25].

A survey conducted in 167 municipalities in the state of Rio Grande do Norte, in the Brazilian Northeast, found a Maternal Near Miss ratio of 36.71/1000 women. As to the risk conditions, preeclampsia had the highest mean (24.66), followed by hemorrhage (4.55) and sepsis (4.29), and strong correlations were found between Maternal Near Miss and SMM and poverty-related socioeconomic variables[26].

As for the increased risk of Maternal Near Miss, this was more present among indigenous populations, justifying the inadequate access to disease prevention and health promotion programs. An increased risk was also found in women who traveled for more than one hour to the health facility, or who waited for more than an hour to be admitted[27]. Such findings are recurrent in the literature that addresses the importance of the hospital structure quality, the viability of access and promptness of medical care[14,29].

A multicenter study held in 27 maternal and child care referral centers in the five regions of Brazil between 2009 and 2010 found an association between delayed obstetric care and the occurrence of severe complications in pregnancy and childbirth, affecting the child's health, suggesting that a golden time management of obstetric care is required in order to ensure mother-child survival[30].

In an investigation conducted in Mozambique involving five health facilities that offer obstetric emergency services, the avoidable factors that were associated with the "three delays model" were analyzed[15]. The first type of delay occurred in 63.8%

of the cases, being related to the women's beliefs and to the negative perception of the health services; the second type of delay was found in 21.3% of the cases and justified by the lack of resources and the distances traveled to reach the health centers; the third delay, in 69.7% of the interviews, was related to delayed referral of the patient and initiation of treatment, such as lack of blood for blood transfusion and available surgical rooms[30].

Available criteria for evaluation of the Maternal Near Miss and its use for orientation of public policies

The analysis of the care process to which the patient was submitted before, during and after the near miss events has been increasingly used to evaluate the quality of the functioning of health systems worldwide[1,2,31]. Nevertheless, due to the use of non-standard criteria to evaluate the near miss conditions, which renders it impossible to compare the studies[32]. WHO developed a new definition in 2011, establishing specific criteria[32-34].

In an attempt to advance with respect to the knowledge of the expression near miss, scholars of the subject propose a standardization with criteria[4] that allow for comparisons between different areas and health services, and in different periods of time[32]. In this way, it can be evaluated according to three different types of criteria, collected on the basis of medical records analysis[3].

1) Clinical criteria related to a specific, severe and potentially life-threatening condition: these are serious conditions that have the potential to threaten the woman's life during pregnancy, childbirth and the puerperium. In this case, severe pre-eclampsia, eclampsia, severe postpartum haemorrhage, sepsis, uterine rupture, and severe complications of abortion stand out. Conditions that may contribute to a near miss or maternal death event, which are not directly related to the occurrence of such events, are not included in these criteria and should be described as contributing or associated pathologies - for instance, anemia, HIV infection, previous caesarean section, and prolonged/obstructed labor[3]. These criteria have the advantage of being easily interpreted and helping to increase surveillance of serious diseases and conditions, among which the near miss cases may arise. Moreover, they make it possible to evaluate even the quality of care of the services and to aid in the composition of the clinical and epidemiological characteristics of certain diseases. Despite that, these criteria are regarded as less specific for evaluating near miss cases and liable to influences brought by gaps in the medical records[32].

2) Criteria related to specific critical interventions: these refer to the interventions conducted in order to manage life-threatening situations. Thus, ICU admissions, emergency surgical procedures in the abdominal cavity (except cesarean section), hemotransfusion and interventional radiology[3] fall within this criteria, which are considered of simple interpretation, though less specific, due to the divergences between the ICU structural conditions (physical conditions/equipment, multiprofessional team and work process) and the use of different criteria for the decision regarding surgical intervention[32]. In addition, the use of these criteria is restricted to health facilities with a more complex level of attention.

3) Criteria related to organ dysfunction: these are associated with life-threatening conditions, such as cardiovascular, respiratory, renal, hematological, hepatic, neurological or uterine dysfunction[3]. These criteria impose limitations as they require the use of markers, monitoring and health care in services that provide complex and intensive care, which prevents their application in facilities lacking qualified technological and human resources; these criteria, however, should be regarded as the ones that will validate the cases of near miss, since their definition is based precisely on cases of women who have undergone multiple dysfunctions and organs failure - the pre-death phase - and survived[4,22,32]. It is important to emphasize that the use of these criteria guides the management of severe conditions, which, by receiving intensive and qualified care, do not cause the death of these women[32].

The analysis of near miss cases by means of such criteria should be conducted with the use of data on pregnant women at any gestational age, in labor, during the puerperal period, or within up to 42 days after an abortion, and who seek the health service presenting some of the conditions comprised in the evaluation criteria, or develop them during their stay in the service, and it is important to differentiate those situations. Women who exhibit these conditions but show no relation to gestation can not be analyzed according to the near miss criteria[18].

The cases of women who died and did not access the health system and those who died during admission to the service can also be assessed according to these criteria, representing the group of cases originated from lack of access and late access to the health system[3].

The WHO provides a form for collecting these types of data for analysis (Maternal Near Miss Tool) and recommends that additional information be recorded, such as the dates related to the most relevant occurrences, the moment of the complication presented by the woman (before, during or after childbirth), the gestational age, type of delivery, the child's vital status, the woman's condition upon arrival at the health service, and also underlying causes and pathologies contributing to the occurrence of near miss and maternal death cases. It is also recommended to record data regarding the service, such as the health care level, existing resources and the total number of births and live births in the facility during the data collection interval[32].

DISCUSSION

In this context, Maternal Near Miss emerges as a social indicator, reaffirming the perpetuation of social inequities and the difficulty in incorporating into the broad intersectoral complex the political guidelines that seek to reduce the exclusionary gaps in the achievement of racial equality[35].

Authors state that a large number of factors that culminate in SMM and mortality are directly related to the iniquities to which women are exposed[27].

The combination of the categories race, gender, socioeconomic conditions, and other sociodemographic characteristics shows how the health services in basic health care are organized, as well as indicates the obstacles faced by women in accessing health services[27], thus contributing to a higher occurrence of SMM and mortality in a specific group of women. Black and poor women die more[18,25,27]. Beyond cosmetology, this is what the studies show[25], which may explain a higher prevalence of near miss in less-developed countries[22].

The studies point to some clinical determinants directly related to the occurrence of Maternal Near Miss. Among them, one can highlight: high-risk gestation; hospitalizations during pregnancy; clinical comorbidities, mainly severe hypertension, infections and hemorrhages; cesarean deliveries; use of fórceps; and need for ICU admission[2,9,10,11]. Although some studies have associated a higher occurrence of near miss with the extremes of reproductive age[2,9,12], others have found a higher occurrence in women between 20 and 35 years[12,13,36].

In addition to the presence of comorbidities, the quality of prenatal care and the presence of intercurrences that delay the access to health services emerge as important factors associated with SMM[17].

These findings demand inquiries about the impact posed by government investments (policies, guidelines, structures, human and financial resources) on the reduction of maternal mortality for reorganization of women's health care in the pregnancy-puerperium cycle, as most treatments of obstetric complications are identified as known and preventable[21,22].

In this context, using the concept of near miss as an indicator of maternal health emerges as a viable tool for assessing the quality of the health service and the impact of public policies aimed at improving maternal health[2,23], mainly in the face of the underreporting of maternal deaths, common in developing countries[3]. It is important to emphasize that one of the differentials for requalification of health care professionals and management professionals in combating maternal deaths is actually the "embracement" and the accomplishment of qualified listening.

With such conviction, the experiences of women who have experienced near-death can not and should not be portrayed only by numbers. The narratives of their impressions, of inherent perspectives in life histories, are presented as disclosures of important gaps, plausible to be remedied in the context that circumscribes the reproductive health care and contributes to reducing the severe complications of pregnancy[5].

Another relevant aspect pointed out in the studies refers to the qualification of health professionals, since the early detection of complications resulting from pregnancy and the provision of emergency obstetric care becomes essential for the reduction of maternal near miss and mortality rates[21-19].

The identification of hypertensive diseases as one of the most frequent conditions in Maternal Near Miss cases is noticeable, not only due to their prevalence, but also to their great potential to trigger damages that predispose to the occurrence of this severe maternal morbidity. The correlation with socioeconomic variables suggests that the decompensation of the condition or the underdiagnosis of these clinical conditions is directly associated with deficiencies in the follow-up and monitoring in basic health care[19]. It stands out the importance of an articulated maternal care network with efficient support by the tertiary care, such as intensive care unit (ICU) obstetric beds and qualified human and technological resources[29].

The inefficiency in specialized care, without a supply regulation in relation to the demand for ICU beds, is one of the main factors accountable for delays, based on the "three delays model" in caring for women with SMM[2], which classifies into three categories the different situations liable to contribute to the delay in the access of pregnant women to effective and adequate therapy. The first delay would be related to the decision to seek obstetric care or emergency and would be influenced, for example, by sociocultural factors, such as how distant the health facilities are and the financial costs; the second one represents the delay in reaching the first health unit, considering physical barriers; and the third one is the delay faced by the pregnant woman to travel from the facility where the first care is performed to the place where she will be provided with final care, in case referring her is necessary[19].

Furthermore, using the concept of near miss in research addressing the area of planning and public policies makes it possible to interview surviving women, providing subsidies for the implementation of a prospective surveillance system, since there is a sentinel event behavior[2].

An interinstitutional study is under way in the state of Ceará in order to determine, among other factors, the therapeutic itinerary of women diagnosed with near miss in the health care network, as well as to identify the network "blind spots" that have contributed to the onset of this morbidity.

CONCLUSION

It was possible to verify from the findings the need for an articulated maternal and child care network, with adequate and efficient support to all levels of care, especially to the tertiary level, through the sufficient supply of ICU obstetric beds, trained professionals, and accessible technological resources as well. In this context, the information proves extremely relevant for the planning of training and qualification strategies for health professionals, since the early detection and the provision of emergency obstetric care are essential to reduce maternal near miss and mortality rates.

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