

Maternal Mortality Profile: An Integrative Literature Review

Perfil da Mortalidade Materna: Uma Revisão Integrativa da Literatura

El Perfil de Lamortalidad Materna: Una Revisión Integradora

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ABSTRACT

Objective: The study's goal has been to both know and analyze the aspects that the studies from national and international literatures can reveal about the profile of maternal mortality. **Methods:** It is an integrative literature review. The search was conducted in August 2017, through the Virtual Health Library (VHL), searching in the databases named *Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS)* [Latin-American and Caribbean Literature in Health Sciences], Medical Literature Analysis and Retrieval System Online (MEDLINE), Nursing Database (ND); establishing inclusion and exclusion criteria, and then selecting nine studies. **Results:** The epidemiological profile of maternal deaths is influenced by social factors, which reflect the inequalities present in the world, the disparities in accessing health services, education and other factors that affect a vulnerable group at alarming rates. **Conclusions:** The studies suggest the need for greater efforts regarding the engagement of society, public agencies and health professionals, aiming to bigger commitment and co-responsibility in the struggle to reduce maternal mortality.

Descriptors: Nursing, Women's Health, Maternal Mortality, Public Health.

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RESUMO

Objetivo: Conhecer e analisar os aspectos que os estudos da literatura nacional e internacional revelam sobre o perfil da mortalidade materna.

Métodos: Revisão da literatura, a busca foi realizada em agosto de 2017, por meio da Biblioteca Virtual em Saúde, nas bases de dados da Literatura Latino-Americana e do Caribe em Ciências da Saúde, *Medical Literature Analysis and Retrieval System Online* e, Base de dados da Enfermagem, estabelecendo-se critérios de inclusão e exclusão, sendo selecionados nove estudos. **Resultados:** O perfil epidemiológico dos óbitos maternos é influenciado por fatores sociais, os quais refletem as desigualdades que assolam o mundo, a disparidade nas formas de acesso aos serviços de saúde, a educação e demais fatores que repercutem num grupo vulnerável para índices alarmantes. **Conclusões:** Os estudos refletem a necessidade de maiores esforços com engajamento da sociedade, órgãos públicos, profissionais de saúde, com vista a maior comprometimento e co-responsabilização na luta pela redução da mortalidade materna.

Descritores: Enfermagem, Saúde da Mulher, Mortalidade Materna, Saúde Pública.

RESUMEN

Objetivo: Investigar y analizar los aspectos que el estudio de la literatura nacional e internacional revelan sobre el perfil de la mortalidad materna.

Metodos: La revisión se realizó en agosto de 2017, a través de la Biblioteca Virtual en Salud, en las bases de datos de la Literatura Latinoamericana y del Caribe en Ciencias de la Salud, *Medical Literature Analysis and Retrieval System Online* y, Base de datos de la literatura Enfermería, estableciéndose criterios de inclusión y exclusión, siendo seleccionado nueve estudios. **Resultados:** El perfil epidemiológico de las muertes maternas se ve influenciada por factores sociales, que reflejan las desigualdades que aquejan al mundo, la disparidad en las formas de acceso a los servicios de salud, educación y otros factores que afectan a un grupo vulnerable a niveles alarmantes. **Conclusiones:** Los estudios reflejan la necesidad de mayores esfuerzos para involucrar a la sociedad, agencias gubernamentales, profesionales de la salud, con miras a un mayor compromiso y co-responsabilización en la lucha por reducir la mortalidad materna.

Descriptores: Enfermería, Salud de la Mujer, La Mortalidad Materna, Salud Pública.

INTRODUCTION

The World Health Organization (WHO) defines maternal mortality as the death of a woman during pregnancy or within a period of 42 days after termination, regardless of duration or location, due to any cause related to or aggravated by pregnancy or by measures in relation to it, but not by accidental or incidental causes.¹ Maternal mortality is one of the indicators of health discrepancies between developed, underdeveloped and developed countries.²

Nowadays, the ratio of total maternal mortality is around 210 deaths per 100,000 live births.³ Thus, it is considered a challenge to Public Health. Thus, the new Sustainable Development Objectives, which succeeded the Millennium Development Goals, are calling on the world for a joint effort to eliminate maternal mortality from preventable causes between 2016 and 2030.⁴ In Brazil, the goal is to reduce to approximately 20 deaths per 100,000 live births.³

In the meantime, Brazil has been making efforts to organize a universal and egalitarian health system that will reduce maternal mortality. The Ministry of Health (MH) is betting on Health Care Networks, which are developed to offer actions and services, which are integrated by a logistical management system with the purpose of guaranteeing the integrality of care.⁵

In 2011, the MH launched the Stork Network, aimed at the maternal and child population, which is in the process of being implemented in several municipalities. The goal is to implement appropriate care that ensures women the right to reproductive planning and humanized care for pregnancy, childbirth, and the puerperium and for children the right to safe birth, growth and healthy development.⁶

Nonetheless, even with the acknowledged advances in various areas of public policy and public service delivery and improvements in health indicators, there is still a long way to go.⁷ A paradigm shift must be made in graduate and postgraduate training which includes the elaboration of strategies and encourages students to take care of health promotion and prevention and not only to cure diseases.⁸

Likewise, it is understood the importance of broad and articulated actions that point to an effective change of the current assistance model in obstetric care. It has seen the undeniable deficiencies evidenced and considering the high number of deaths that could be avoided.⁹

Considering this understanding, maternal mortality has been seen as a challenge to public health that requires advances and improvements in the quality of care for these women, and this theme is present in item 8.1.4.3 of the National Agenda for Priorities in Health Research.¹⁰ Hence, this study's purpose is to know and analyze the aspects that the studies from national and international literatures can reveal about the profile of maternal mortality.

METHODS

It is an integrative literature review. The purpose of this method is to gather and synthesize research results on a specific theme, here on maternal mortality, making it possible to point out gaps in knowledge and to synthesize multiple published studies, allowing general conclusions about either a particular theme or area of study.¹¹

For the elaboration of this research, the proposed steps were proposed by the authors,¹¹ namely: establishing the research question; elaboration of criteria for inclusion and exclusion of articles; categorization of studies; evaluation of studies; results interpretation; and the knowledge compilation.

To guide the research, the following question was asked: What do the studies on the profile of maternal deaths can reveal? The selection of the articles was carried out through the Virtual Health Library (VHL), searching in the databases named *Literatura Latino-Americana e do*

Caribe em Ciências da Saúde (LILACS) [Latin-American and Caribbean Literature in Health Sciences], Medical Literature Analysis and Retrieval System Online (MEDLINE), Nursing Database (ND).

The search for the studies was done in August 2017, using the Boolean operator “and”, with the descriptors “Women’s Health” and “Maternal Mortality”, both indexed in the Descriptors in Health Sciences (DeCS). The search was started with the descriptor “Maternal Mortality”, finding 14,449 studies being (MEDLINE 11859), (LILACS 2487), (ND 103). Adding the Boolean operator “and” to the descriptor “Women’s Health”, refined to 684 studies, being (MEDLINE 394) (LILACS 247) (ND 43). By filtering the search for the available free studies, the quantitative study declined to 289 (MEDLINE 148), (LILACS 112), (ND 29).

The search for 151 studies (MEDLINE 82), (LILACS 54) and (ND 15) was reduced using the temporal period of the last five years (2012 to 2016), in order to facilitate the exploration of the current scientific literature. Using the filter by human species the search in said databases was finished with 130 studies, being these (MEDLINE 82), (LILACS 38), (ND 10), as shown in **Figure 1**.

Figure 1: Searching strategies.

Database	Maternal Mortality	Maternal Mortality “and” Women’s Health	Filter- Available studies	Filter- Last five years	Filter- Human species
MEDLINE	11,859	394	148	82	82
LILACS	2,487	247	112	54	38
ND	103	43	29	15	10
Total	14,449	684	289	151	130

After searching, the studies were submitted to the inclusion and exclusion criteria. The following were excluded: Theses and dissertations, literature review studies, manuals and studies not classified as articles. Included were English, Spanish and Portuguese language articles available online that met the proposed goal.

In the *LILACS* database, of the 38 studies, (two) are monographs, (two) theses, (four) dissertations, (three) are not articles, (two) literature review, (one) duplicate, (16) adapted to the study, (eight) contemplate the purpose of the study. When analyzing the 10 studies published in the ND, (four) did not respond to the proposed objective and (six) were repeated in *LILACS*, therefore, this basis was excluded from the study.

In the MEDLINE database of the 82 articles, (6) literature review, (11) are not articles, (one) duplicate, (sixty) are not available online/for free, (03) do not respond to the objective, do respond to this study’s objective. Consequently, in the end, (nine) studies were included and submitted to the analysis.

The descriptions of the articles were performed by descriptive statistical analysis, being quantified by their

nature. The content analysis was carried out in the modality, thematic analysis, where the studies were grouped by content similarity.

The analysis of the evidence level of articles was also done.¹³ It is subdivided into seven levels, as follows: level I, systematic review or meta-analysis; level II, randomized studies, controlled clinical trials; level III, controlled clinical trials without randomization; level IV, case-control or cut-off studies; level V, systematic reviews of qualitative or descriptive studies; level VI, qualitative or descriptive studies; level VII, opinion studies, judgment or consensus.

RESULTS AND DISCUSSION

An overview is presented below. Observing the publication year, 2012 (22.22%), 2013 (44.44%), 2014 (22.22%) 2015 (11.11%). The nationality, (88.88%) are Brazilian, (11.11%) international. From the national studies (22.22%) in the *Rio Grande do Sul* State, (22.22%) were in *São Paulo*, (11.11%) in *Pernambuco*, (11.11%) in *Fortaleza*, (11.11%) in *Maranhão* and (11.11%) in *Santa Catarina*.

The international study was conducted in Asia. Concerning the methodological approach (44.44%) of the studies used the quantitative approach and (55.44%) did not describe it. Regarding the design used, (A6) retrospective and exploratory study, (A1, A2) descriptive and ecological studies, (A3) retrospective, cross-sectional, and epidemiological study, (A4, A5, A8, A9) descriptive studies, (A7) descriptive, retrospective, population-based study. Thus, the nine studies that composed this research have an evidence level of VI.

For the data collection, the studies used (A3) medical records and death certificates (A4), reports of the Medical Medical Institute, records of the Mortality Information System (MIS), hospital records and Family Health Strategies and interview with relatives of deceased women, (A5) MIS and maternal death records of the municipality, home interview, necropsy reports, hospital health service, (A6) death certificates of the MIS, (A1, A2, A7) MIS and and Information System on Live Births, (A9) National reports, data from the National Health Management Information System, Demographic and Health Surveys and information from the National Reproductive Health Program, (A8) hospital records.

The data analysis contemplated the following: (A1, A3) Statistical Package for the Social Sciences - SPSS version 13.0, (A2) Epi Info Program and Poison Regression, (A4) does not describe, (A5) SPSS version 19.0, (A6, A8) Microsoft Excel Spreadsheet (A7) correction factor resulting from research developed in Brazilian reality (A9) does not describe. The following is a summary of the articles included in this study, represented in **Table 1**.

Table 1 - Compilation of studies according to the Journal, Article, Intervention studied, Design used and Evidence Level (EL).

Code	Article	Intervention	Design	EL
A1 ¹⁴	Carreno I, Bonilha ALL, Costa JSD. Evolução temporal e distribuição espacial da morte materna. Rev Saúde Pública 2014;48(4):662-70.	Analyzing the temporal evolution of maternal mortality and its spatial distribution.	Descriptive and ecological study.	VI
A2 ¹⁵	Carreno I, Bonilha ALL, Costa JSD. Perfil epidemiológico das mortes maternas ocorridas no Rio Grande do Sul, Brasil: 2004-2007. Rev Bras Epidemiol 2012; 15(2): 396-406.	Analyzing the epidemiological profile of maternal deaths occurred from 2004 to 2007 in the Rio Grande do Sul State.	Descriptive and ecological study.	VI
A3 ¹⁶	Fernandes BB, Nunes FBBF, Prudêncio PS, Mamede FV. Pesquisa epidemiológica dos óbitos maternos e o cumprimento do quinto objetivo dedesenvolvimento do milênio. Rev Gaúcha Enferm.2015;36(esp):192-9.	Identifying and describing the epidemiological characteristics of maternal deaths occurring between 2000 and 2012 in a reference hospital in the interior of São Paulo State.	Retrospective, cross-sectional, and epidemiological study.	VI
A4 ¹⁷	Alves MMR, Alves SV, Antunes CMB, Santos DLP. Causas externas e mortalidade materna: proposta de classificação. Rev Saúde Pública 2013;47(2):283-91.	Analyzing the deaths due to external causes and ill-defined causes in women of childbearing age during pregnancy and early puerperium.	Descriptive study.	VI
A5 ¹⁸	Afio ACE, Araújo MAL, Rocha AFB, Andrade RFV, Melo SP. Óbitos maternos: necessidade de repensar estratégias de enfrentamento. Rev Rene. 2014; 15(4):631-8.	Analyzing maternal deaths and present the Maternal Mortality Ratio in Fortaleza city, Northeastern Brazil, from 2008 to 2010.	Descriptive study.	VI
A6 ¹⁹	Costa ACPJ, Souza LM, Costa DD, Freitas LV, Damasceno AKC, Vieira NFC. Maternal mortality in a regional health jurisdiction in the Brazilian state of Maranhão: a retrospective study. Online braz j nurs.2013;12 (4):854-61.	Investigating the causes of maternal deaths in a Health Regional of the Maranhão State.	Retrospective and exploratory study.	VI
A7 ²⁰	Martins HEL, Souza ML, Dalmas JC, Arzuaga-Salazar MA. Mortalidade materna por hemorragia no Estado de Santa Catarina, Brasil. Rev Esc Enferm USP. 2013; 47(5): 1025-30.	Analyzing the maternal deaths related to hemorrhage occurred in the Santa Catarina State, Brazil.	Descriptive, retrospective, population-based study.	VI
A8 ²¹	Gil MM, Gomes-Sponholz FA. Declarações de óbitos de mulheres em idade fértil: busca por óbitos maternos. Rev Bras Enferm. 2013; 66(3): 333-7.	There were analyzed reported maternal deaths, non-maternal, inconclusive deaths and presumed deaths.	Descriptive study.	VI
A9 ²²	Liljestrand J, Sambath MR. Socio-economic improvements and health system strengthening of maternity care are contributing to maternal mortality reduction in Cambodia. Reproductive Health Matters 2012;20(39):62-72	It analyzes the evolution of some of the major social and health factors based on recent national and international reports.	Descriptive study.	VI

Source: Compilation of the studies arranged by the authors.

Note: The titles were kept as in their original language.

A Brazilian study, performed in the *Rio Grande do Sul* State, addressed the epidemiological profile of maternal deaths, and observed over the 10 years a direct relationship between the Maternal Mortality Ratio (MMR) and the women's age. The data show that, as the age groups increased, the chances of maternal death increased. In 2007, eight maternal deaths were observed in the 40-49 age group. In that same year, the age group from 20 to 29 years old presented the lowest indexes (A1-A2).^{14,15}

On the other hand, a Brazilian study carried out in the *Santa Catarina* State, which analyzed 58 medical records/death certificates, found that the lowest age found among maternal deaths was 14 years old, the highest age was 44 years old, and the average age being 29.11 years old (A3).¹⁶ Studies performed in the States of *Pernambuco* and *Fortaleza* found similar data in which the majority of women were between 20 and 29 years old (A4-A5).¹⁷⁻⁸ In the *Maranhão* State, the study shows the profile of maternal deaths, of the 29 maternal deaths analyzed (27.58%) of women aged 21 to 25 years old (A6).¹⁹

Concerning the race/skin color, most maternal deaths occurred in black women (A2-A4),^{14,16} with oscillations in brown women (A1).¹⁴ The brown color was prevalent in three studies (A2-A5-A6).^{15,18,19} Already in another study, the majority of maternal deaths occurred in white women (70.7%) (A3).¹⁶ And in (A2),¹⁵ the white women were those that in all study period had a lower relation with maternal mortality. In regards to marital status, maternal mortality was highest among women classified as single. In two studies, most of the women lived with a partner (A3-A5).^{16,18}

Regarding the schooling, the lower the maternal mortality ratio (A1-A2-A6),^{14,15,19} the higher the proportion of schooling found in women with first or incomplete first degree, 24 (42.9%) (A5),¹⁸ and (10.3%) of the women presented some type of schooling (A3-A4).^{16,17}

With regards to the obstetric history, it was verified that women had from one to three previous pregnancies, or even more. The prevalent type of delivery was cesarean delivery (A3-A5).^{16,18} It was possible to identify that 34 (60.7%) women presented some health problems during pregnancy, especially arterial hypertension, cardiopathy, HIV (A5).¹⁸

In 33 (56.9%) women had no previous abortions (A3),¹⁶ and considering the women that died, 11 (26.2%) had abortion history and (11.9%) of stillbirth (A5).¹⁸ Considering the prenatal visits, 26 (44.9%) underwent prenatal consultations, 33 (58.9%) received at least one prenatal visit, 11 (33.3%) were classified with some risk factor and, of these, eight (72.7%) were attended at high-risk prenatal care (A5).¹⁸

According to data from the medical records and death certificate, in 84.5% of the women due to obstetric complications during gestation and postpartum, (15.5%) resolution of pregnancy, and (43.1%) had severe or agonizing/lifeless conditions during hospitalization (A3).¹⁶

Results of this review point to the need for attention, due to the action of indirect factors, such as incorrect completion of the investigation records and the death certificate (A4, A7, A8).^{17,20,21} Still, loss of medical records, lack information on them or damage to printed matter, information not specified in medical records or death certificates and under-registration (A2, A3, A4, A5).^{15,18}

The vital record of births and deaths is also biased in the international literature. In Cambodia, national systems for the detection and reporting of maternal deaths still only report (30%) of the estimated total deaths (A9).²²

An axis was established to discuss the results, being named as “The profile of maternal deaths”.

The profile of maternal deaths

Maternal mortality may occur in different age groups. The highest prevalence may be when it is elevated, because of the risk of greater complications and chronic diseases already existing, or when they are in the “pinnacle” of the reproductive period. In the present study, the highest prevalence of maternal death occurred from 20 to 29 years old. This result is in line with a study carried out in *Recife*, whose objective was to characterize the epidemiological profile of maternal deaths in a public referral hospital, where it found that the age group with the highest number of maternal deaths was between 20 and 29 years old, representing (47.3%) of the cases.²³

Another study in India aimed at analyzing the trend of maternal mortality in a tertiary center, concluded that the age of highest incidence was between 20 and 30 years old.²⁴ The occurrence of death during this period reveals the need to improve oversight for the prenatal care, childbirth and puerperium and, above all, to strengthen the early detection of high-risk pregnancies.²⁵

Considering the race, it can present a distinct predominance when inserted in the studies, since it will also depend on the place and population that will constitute it. The black and brown breed were the ones that stood out in the majority of the maternal deaths, which corroborates with a study carried out in a northeastern municipality that determined the profile of maternal deaths and found a predominance in brown women.²⁶

Also, a study conducted in *Recife*, the deaths predominated among black women (45.1%).²³ The race should be considered carefully, because it allows to evaluate social and even access to health care issues, revealing the inequalities faced by this group, in relation to health services.²⁵

The causes of maternal death are also related to the biological predisposition of black women to diseases such as arterial hypertension, factors related to poor access, poor quality of care received and lack of actions and training of health professionals, focused on specific risks to which black women are exposed.² The black race, even though it is

equivalent to 5.96% of Brazilian women of childbearing age, has a percentage of 10.49% of these deaths in the country.²⁷

In regards to marital status, maternal mortality was highest among women classified as single. The authors who carried out a study to present the profile of maternal mortality in Brazil from 2000 to 2009, through the Department of Informatics from the *Sistema Único de Saúde (SUS)* [Brazilian Unified Health System] and the Instituto Brasileiro de Geografia e Estatística (IBGE) [Brazilian Institute of Geography and Statistics], affirmed that single marital status represents the majority of deaths.²⁷

These same authors sustain that single pregnant women, as well as widows and separated, tend to constitute a vulnerable group. This group is mostly faced with a lack of affective, emotional, social, financial and stimulating support for the mother’s self-care by the baby’s father and the family.²⁷

The results of this review pointed out that the lower the schooling, the greater the relation with maternal death. This finding is in line with the study whose objective was to describe the epidemiological profile and the trend of maternal mortality in Brazil, through a review of productions on the subject, which pointed out that maternal death is associated with inequalities related to schooling.²⁸

Therefore, the study that evaluated maternal care seeking behavior and associated factors of reproductive age women in rural villages in eastern Ethiopia found that women who could read and write were 4.8 times more likely to seek prenatal care services than their counterparts, which reduces maternal mortality in comparison to those with low schooling.²⁹

Hence, a close relationship can be noted between maternal mortality and socioeconomic conditions, where the low level of schooling of women may interfere negatively in obtaining information on contraceptive methods and adherence to the guidelines provided in prenatal care. Therefore, ensuring more schooling for the female population could be an important way of helping to reduce unwanted pregnancies and the risk of maternal death.³⁰

The most prevalent obstetric history was found in a study conducted in *Campinas*, Brazil, which aimed to describe the frequency of maternal mortality in a tertiary care hospital and to evaluate its avoidability. It found that the women in the study had some type of arterial hypertension; others had heart disease, were HIV positive, and had complications in previous pregnancies. Moreover, the cesarean section³¹ was the main delivery route, and the majority of the women had many childbirths.²⁴

These findings corroborate with the present review and point to the need to improve access and quality of any and all care that women may need in the pregnancy-puerperal period.³² The more qualified the care, the lower the hospitalization rates due to obstetric complications, where the survival of the woman is closely related to the quality of care provided.^{2,33}

Furthermore, maternal deaths occur mainly in hospitals²⁶ and the risk of death was more associated with *SUS*

hospitals.³⁴ Thus, progress in health conditions challenges health professionals to reduce maternal mortality rates. It is necessary not only to improve the quality of prenatal care, delivery, and puerperium, but also social investments, orienting public policies for basic education, reducing poverty and social inequalities, considering the impact of these factors on the women's health.⁸

Regarding the causes of obstetric admissions, a study that analyzed the rates of obstetric admissions of women residing in the *Paraná* State in 2010, found that (37.8) hospitalizations occurred due to complications during pregnancy, delivery and the puerperium.³⁵ The periods prepartum and postpartum were the ones with the highest number of deaths.³⁶

The deaths that occurred in the gestational period were the most frequent, followed by those that occurred in the puerperium. We can infer that gestation because it is a period of physiological changes in the maternal organism to maintain the viability of the concept, is the moment that inspires more care for these women. So, it is necessary to focus on health education strategies that aim to guide the importance of prenatal care, prevention of diseases, encouragement of healthy life habits and education of women to recognize complications.³⁷

The ideal time to perform these activities is during the prenatal consultation because it allows a group and individual approach.³⁷ It is also worth noting the importance of follow-up in this period, since, after childbirth, risk factors remain and complications occur that can proceed to death.²³

Another important result was the underreporting of maternal deaths, which is related to incorrect completion of death certificates, as a result of doctors' lack of knowledge about the correct completion and relevance of this document as a source of health data. Thus, the absence of a record of the linkage of the death of women of childbearing age with the phases of the puerperal pregnancy cycle represents one of the great problems for the correct measurement of the prevalence of maternal death.³⁸ This is because a portion of these deaths is not reported or is totally unknown, which makes maternal death a problem of more difficult recognition and, consequently, study and resolution.²⁸

It is possible to infer that the epidemiological profile of maternal deaths is influenced by social factors. Factors that reflect inequalities in the world, disparities in access to health services, education, and other factors, all of which have repercussions on a group vulnerable to these alarming rates. Additionally, underreporting demonstrates the need for training and awareness of physicians in the adequate completion of death certificates, allowing better monitoring and measures aimed at preventing them.

CONCLUSIONS

Bearing in mind the aforesaid, the profile of maternal deaths reflects the need for greater efforts regarding the engagement of society, public agencies and health profes-

sionals, aiming to bigger commitment and co-responsibility in the fight to reduce maternal mortality. These battles are related to human rights and citizenship, which also depend on political decisions that guarantee health to this group.

The underreporting pointed out in the analyzed studies reports the fragility in estimating more precisely the profile of maternal deaths, which can be seen as a limitation of this integrative literature review. This fact demonstrates that underreporting is still a problem to be solved. It is suggested that new studies must analyze the difficulties faced by medical professionals in completing death certificates, as well as in the real monitoring of maternal deaths surveillance.

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